



2018-2022 Studies on the TEN-T Core Network Corridors and Support of the European Coordinators – Phase 2

BALTIC-ADRIATIC CORRIDOR

Project Implementation Report 1/2022

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Abbreviations

BAC	Baltic Adriatic Corridor
CNC	Core Network Corridor according to Regulation (EU) 1316/2013
DG MOVE	European Commission – Directorate General for Mobility and Transport
EC	European Commission
EIA	Environmental Impact Assessment
ERTMS	European Rail Traffic Management System
EU	European Union
GDP	Gross Domestic Product
IFI	International Financial Institutions
IWW	Inland waterway
km	kilometre
KPI	Key Performance Indicator
m	metre
mln	Million
MTMS	Multimodal Transport Market Study
MoS	Motorway(s) of the Sea
MS	Member States of the European Union
n.a.	not available / not applicable
p.a.	per year / annual
PIR	Project Implementation Report
RFC	Rail Freight Corridor
SEA	Strategic Environmental Assessment
TEN-T	Trans-European Transport Network
TENtec OMC	TENtec (the European Commission's information system to coordinate and support the Trans-European Transport Network Policy) Open Method of Coordination

Country Codes after ISO 3166:

PL	Poland
CZ	Czech Republic
SK	Slovakia
AT	Austria
IT	Italy
SI	Slovenia

1 Introduction & Scope

This document is submitted by TPLAN Consulting S.r.l. and their sub-contractors, NDCON, Paradigma and the University of Maribor in fulfilment of the requirements of Contract No. MOVE/B1/2018-216, regarding Studies on the TEN-T Core Network Corridors and Support of the European Coordinators – 2018-2022 Corridors' Studies. More specifically this report relates to the delivery of the analysis for LoT 1 of this contract, concerning the development of the Baltic-Adriatic (hereinafter BA) Core Network Corridor (CNC).

According to Tender Specifications, a project implementation report is to be submitted every six months as part of Task 3 of the study. Task 3 builds on the requirement that biannual updating of the entire project list and of the Work Plan of the European Coordinators should be accompanied by a more frequent status analysis of the projects which will allow the Commission and the Coordinator to counteract in case of inconsistencies and delays. Therefore, the implementing stages of projects and their financing shall be monitored twice a year throughout the study phases I (June 2018 – May 2020) and II (June 2020 – May 2022) of the 2018-2022 CNC studies.

According to Tender Specifications, Task 3 is broken down into six sub-tasks:

- The monitoring process of the projects' implementation status is a matter of Task 3.1;
- Task 3.2 analyses the progress of the projects with respect to the updated data;
- Task 3.3 compiles the results of Tasks 3.1 and 3.2 (reporting);

Methodology and detailed work steps of these three sub-tasks were described in detail in the Inception Report and in the Project Implementation Report 1/2018, submitted in September 2018. The methodology was harmonised amongst the nine CNC studies Contractors (red frame in Figure 1 overleaf). In contrast, Task 3.4 and 3.5 are subject to specific request and are treated individually by the Corridor Consultants:

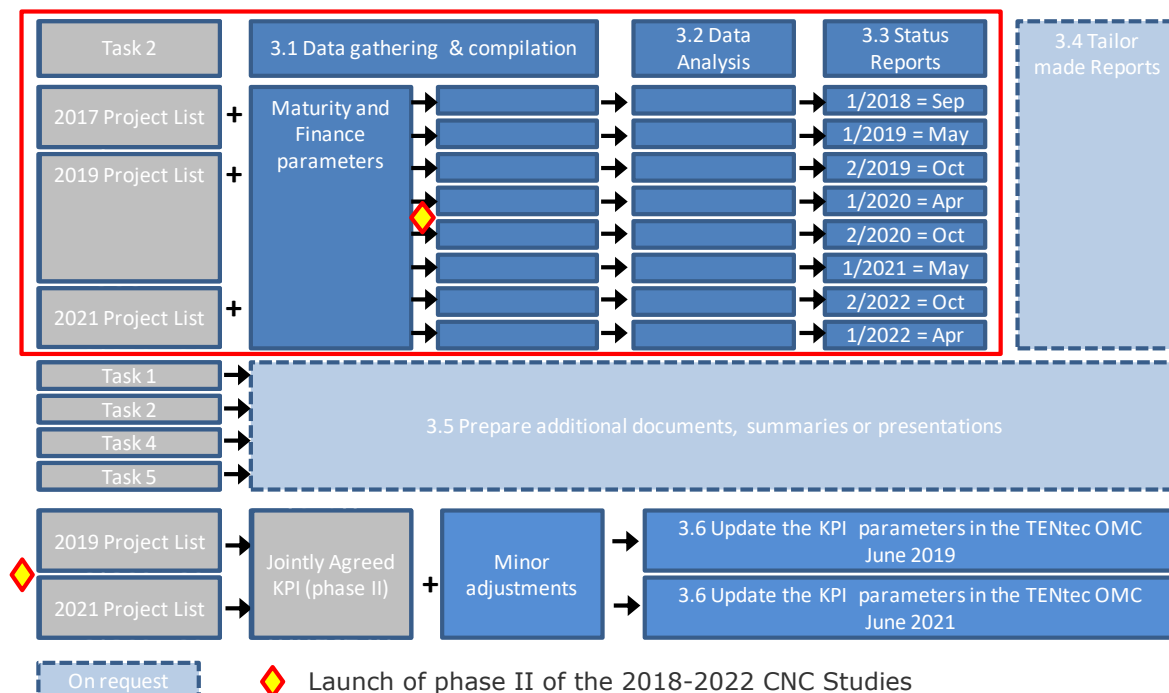
- Task 3.4 provides input to the Coordinator's missions;
- Task 3.5 prepares further documents including results from other tasks.

Additionally, Task 3.6 is foreseen by the Commission to derive the KPIs update based on TENtec OMC and to up-date the TENtec OMC with data of completed projects. This is also based on a cross-corridor methodical approach, but not subject of this report.

The relation of the specific sub-tasks to Task 2, the updating of the entire project list (within Task 2) and the monitoring of progress on maturity and finance within Task 3.1, 3.2 and 3.3 as well as the other three sub-tasks of Task 3 are also visualized in the figure overleaf.

The first Project Implementation Report (PIR) elaborated during Phase III of the Core Network Corridor Studies (period June 2018 – May 2020) focused on the methodology and the way in which the results should be presented. It has been agreed with the Commission that the 2nd and all subsequent PIRs should be prepared on the basis of this methodology and will thus only include the presentation of updated results (Chapters 3 to 4). The same methodology was also confirmed for the elaboration of the PIRs during Phase IV of the Core Network Corridor studies (period June 2020 – May 2022).

Selected content of this report or additional results of the analysis of the project list related to maturity and finance parameters may be presented at the 17th Corridor Forum in June 2022 and/or other Corridor events, in line with the requirements set in the Tender Specifications of the 2018-2022 CNC studies.

Figure 1 Task 3 - Detailed work programme and interrelations


Source: Consultant's presentation at Kick-off meeting, updated for Working Group Meeting on 12/7/2018

1.1 Status of the project list of the BA Corridor

The project list considered for analysis in this report is the common project list submitted to the European Commission in April 2021. This list – common project list 2021 – is the result of a comprehensive updating process of the whole parameters included in the project list developed in 2019, also including new projects and considering the corridor extensions as defined in the Connecting Europe Facility (CEF) regulation for the period 2021-2027 (CEF2 Regulation). This list – common project list 2021 – has been updated with specific reference to the maturity and financial parameters at the beginning of 2022. Therefore the project list subject of analysis in this report is the common project list 2021, reflecting the status of the projects as of March 2022.

The analysis presented in Chapters 3 and 4 of this report refers to the total number of completed and ongoing projects included in the common project list 2021 of relevance for the BA Corridor.

An abstract of the common project list including the projects of relevance for the BA Corridor is annexed to this report as a separate file.

2 Methodology

As mentioned in Chapter 1, the methodology at the basis of the analysis of the project list and the related reporting are the ones adopted for the elaboration of the Project Implementation Report 1/2018, submitted in September 2018. According to the procedure described therein, it will not be repeated in this and in the subsequent versions of the Project Implementation Reports.

3 Monitoring of Project Maturity

This chapter presents the results of the monitoring of the project maturity where two parameters are relevant:

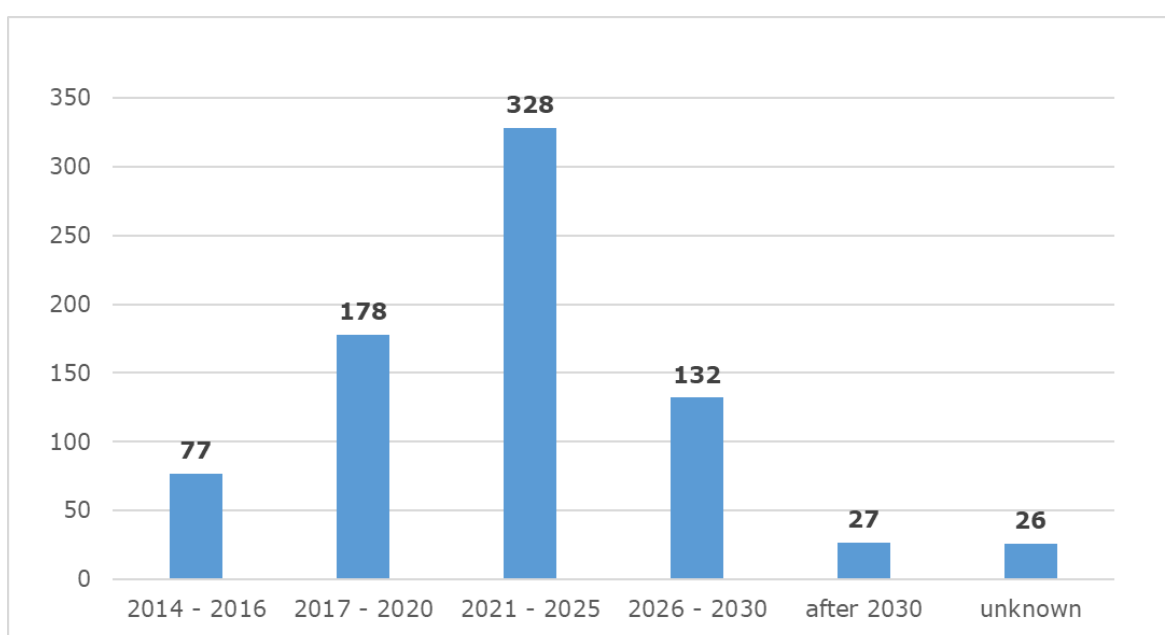
- The number of projects by completion time cluster; and
- Other project maturity parameters, as listed in Section 3.2.

These results are based on the 2021 project list of the BA Corridor.

3.1 Completion Time Cluster

The most important “maturity” parameter is project completion. The following figure visualises the number of projects by envisaged completion time cluster.

Figure 2 Number of projects by completion time cluster (reporting date 12/2022), total = 768 projects



Source: tplan analysis based on project list 2021 updated at March 2022

By the project implementation status date, 768 projects are included in the Baltic-Adriatic Corridor project list. This project list is the result of a narrow update performed between January and March 2022 involving all project promoters, Member States and the European Commission. In comparison to the first Project Implementation Report 1/2018, this updated project list shows an increase of 138 projects. The increase with reference to the PIR 1/2018 (and the following PIRs, which showed relatively stable number of projects) is due to the incorporation of number of new initiatives proposed by the Stakeholders during the project list consultations (as also validated by the concerned Ministries) in the period between January and February 2021. Compared to the PIR 2/2021 the current list contains 1 additional project, which was incorporated by the Stakeholders during the last consultation process performed in view of preparation of this report.

77 projects were concluded between 2014 and 2016, and 225 projects were finalised between 2017 and the end of 2021. In total 302 projects were completed since the entry into force of EU Regulations 1315/2013 and 1316/2013.

93% of the projects on the list have their completion date before or by 2030. Only 27 out of the remaining 7% (i.e. 53 projects) have their expected completion date after 2030 and for 26 projects the completion date is unknown.

39% of all projects (i.e. 302) have been finished by end of 2021. 76% of all initiatives is foreseen to be completed by 2025 and 17% of the projects are expected to be finalised in the “critical” time window 2026-2030.

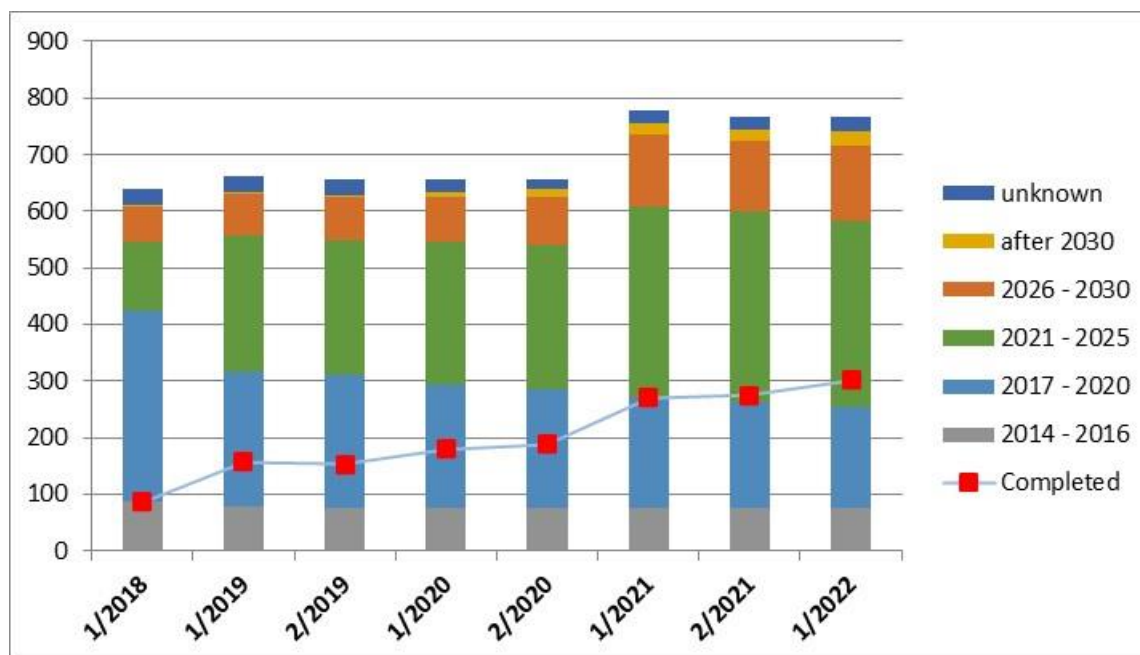
Table 1 Monitoring of the maturity criterion “expected completion time” since the first Implementation Report

Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022
List Status	06/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021
2014 - 2016	87	79	77	76	77	77	77	77
2017 - 2020	336	239	233	219	208	193	187	178
2021 - 2025	123	240	239	250	256	339	335	328
2026 - 2030	61	73	75	79	84	128	125	132
after 2030	5	4	4	10	13	19	21	27
unknown	26	26	27	23	19	21	22	26
Total	638	661	655	657	657	777	767	768
Thereof completed	87	157	153	180	188	270	275	302

Source: tplan analysis based on project list 2021 updated at March 2022

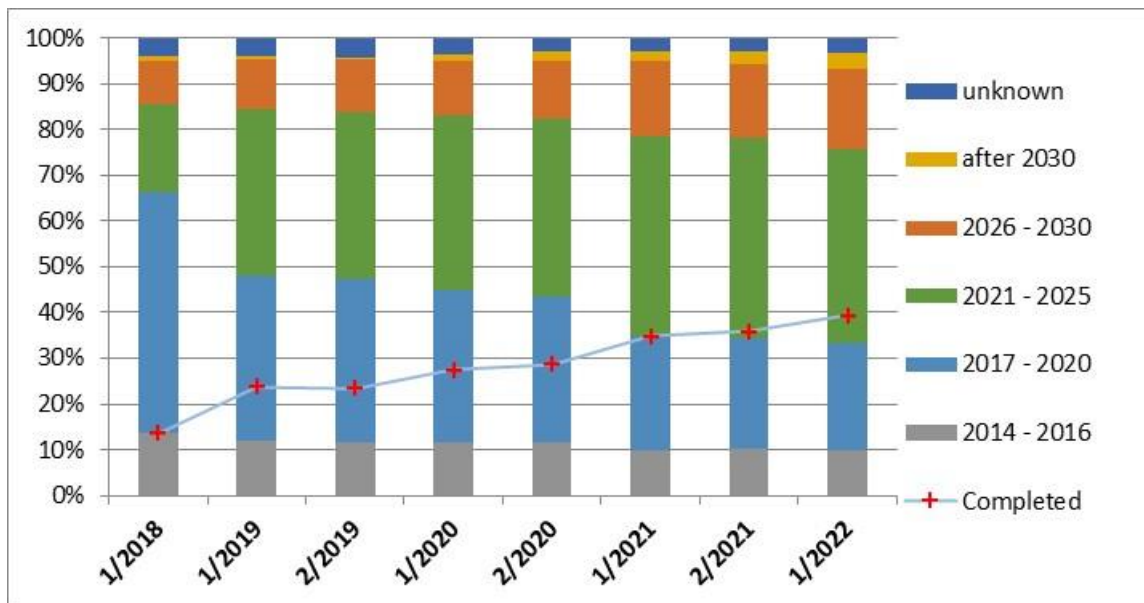
The allocation of the projects to the clusters of expected completion time is displayed in the following figures. These allow for comparison with the former Project Implementation Reports, starting from PIR 1/2018 up to the present PIR 1/2022. In addition to a tabular overview (Table 1), two ways of graphic presentation are provided: the absolute figures showing the quantity of projects (Figure 3) and the standardised figure, pointing out the relative share cumulating to 100% (Figure 4).

Figure 3 Graphical presentation of maturity criterion “expected completion time” in the Implementation Reports [N° of projects]



Source: tplan analysis based on project list 2021 updated at March 2022

Figure 4 Graphical presentation of maturity criterion “expected completion time” in the Implementation Reports [share of projects]



Source: tplan analysis based on project list 2021 updated at March 2022

Compared to the first PIR 1/2018, the following main developments are noticed:

- The number of completed projects increased by 130 (absolute figure) or by 23% compared to PIR 1/2018 and increased by 27 compared to PIR 2/2021. Reference date for project finalisation in the PIR 1/2022 is 31st December 2021;
- As a consequence, the share of completed projects on the total number of projects increased from 14% (PIR 1/2018) to 39% (PIR 1/2022);
- This effect is also visualised in Figure 4: compared to PIR 2/2021 a shift towards later finalisation of projects is visible in the time cluster 2026-2030 and after 2030;
- As expected, railway, road and maritime projects are represented to an above-average extent in long-term finalisation (2026 or later), due to their affinity to large-scale projects;
- The number of projects, for which the completion time is not known, increased by 4 (from 22 to 26 projects).

3.2 Detailed project maturity parameters

A more detailed analysis of the project maturity parameters requires standardised entries that can be exploited statistically. For this purpose, the PIR 1/2018 defined a methodology to reduce the large variety of (formerly free text) entries to a dedicated set of standard values. The adjusted project list structure provides these standard values in selection lists (dropdown lists). During the 2019 update of the project list, as well as subsequent updates, Member States and other Stakeholders were requested to refer to these selection lists exclusively (no free text entries allowed any more).

Table 2 Maturity parameters – allowed and harmonised values

Parameter PL columns BW-CA	Allowed values	Values harmonized/ interpretation
Reference time for information	Individual entries according to update status [MM/YYYY]	Individual entries according to update status [MM/YYYY]
Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA)	4 standard entries: - Not necessary - Not started - In Progress - Concluded	4 standard entries: - Not necessary - Not started - In Progress - Concluded
	[empty]	[empty]
Preliminary project analysis/ Feasibility studies	4 standard entries: - Not necessary - Not started - In Progress - Concluded	4 standard entries: - Not necessary - Not started - In Progress - Concluded
	[empty]	[empty]
Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences*	4 standard entries: - Not necessary - Not started - In Progress - Concluded	4 standard entries: - Not necessary - Not started - In Progress - Concluded
	[empty]	[empty]
Construction/ implementation (% of completion)**	Calculated	

*) "Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences": the assessment includes the highest / last step of the sub-criteria.

***) The parameter "Construction/implementation (% of completion)" is a calculated value of the status between "planned start" and "end date", and does not help with the implementing status so that it is not used for the Project Implementing Report(s).

All maturity (see Table 2 above) and administrative implementation parameters (see Table 3 overleaf) are thus to be classified according to one of the predefined harmonised values. The only exceptions are fields that still had been left empty. According to the general understanding of the first PIR, those (empty) entries would be considered at the same strength as "not necessary" to the purposes of the analysis presented in the PIR.

Table 3 Administrative implementation parameters - allowed and harmonised values

Parameter PL columns CB-CI	Allowed values	Values harmonized/ interpretation
Project start date	Individual entries [MM/YYYY]	Individual entries [MM/YYYY]
Project end date	Individual entries [MM/YYYY]	Individual entries [MM/YYYY]
Implementation strategy	Free text	Free text
Land acquisition	3 standard entries: - Not necessary - Not completed - Completed	3 standard entries: - Not necessary - Not completed - Completed
	[empty]	[empty]
Environmental Impact Assessment (EIA)	5 standard entries: - EIA not necessary - EIA not started - EIA under preparation or updating - EIA completed - EIA approved	5 standard entries: - EIA not necessary - EIA not started - EIA under preparation or updating - EIA completed - EIA approved
	[empty]	[empty]
Final project approval by relevant governmental & administrative authorities	4 standard entries: - Not necessary - Not submitted yet - Submitted, decision pending - Approved	4 standard entries: - Not necessary - Not submitted yet - Submitted, decision pending - Approved
	[empty]	[empty]
CBA	3 standard entries: - Not necessary - In Progress - Performed	3 standard entries: - Not necessary - In Progress - Performed
	[empty]	[empty]
State existing bilateral or multilateral agreements and any other administrative implementation issue.	Free text	Free text

Concerning this assumption it is however worth to mention that empty cells are not interpreted as “not necessary” as originally assumed in the methodology drafted for the elaboration of the first Project Implementation Report. They are just treated in the same way as “not necessary” in the analysis, and thus excluded from the main calculations accordingly (see following paragraphs). During the updating process of the project list, the “applicability” of the “not necessary” parameter by default to empty cells as indicated in the original methodology appeared to be not appropriate. Stakeholders have internal procedures concerning the formal processing of information relating to the monitoring of the implementation of the projects and time-schedules that are not always aligned to the one of the CNC studies. So, for those cases where it was not possible to choose one of the options in the dropdown menu preference was to keep the cell empty, meaning “not certain/not possible to be reported at present” rather than not necessary. This notwithstanding empty cells are statistically equivalent to “not necessary” entries.

The analysis on the seven maturity parameters was carried out in such a way that by each reporting time:

- A. the total number of projects is provided (as a reference);
- B. the number of ongoing or planned projects is provided (clear marking of MM/YYYY which distinguished "completed" projects);
- C. for each parameter the number of projects for which that parameter is „not necessary" or has not been filled is counted;
- D. and consequently the number of "relevant" ongoing or planned projects can be deduced ($B - C = D$);
- E. for the relevant projects only the highest maturity level, e.g. "completed", "concluded", "approved" is counted;
- F. and finally the Ratio $E / D * 100$ can be calculated to demonstrate the maturity status per parameter.

Table 4 Status for maturity parameters of CNC Baltic-Adriatic (N° of projects)

Report N°		1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022
Reporting Date		09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022
List Status		06/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021
Total number of projects,		638	661	655	657	657	777	767	768
- thereof completed		87	157	153	180	188	270	275	302
- thereof ongoing or planned		551	504	502	477	469	507	492	466
Planning Stage	Relevant	281 = 74%	289 = 70%	306 = 70%	295 = 73%	290 = 74%	366 = 70%	355 = 71%	334 = 70%
	Concluded	207	203	213	217	215	257	251	235
Feasibility Stage	Relevant	294 = 65%	334 = 70%	346 = 68%	346 = 68%	342 = 69%	416 = 65%	402 = 66%	373 = 65%
	Concluded	190	233	237	234	235	270	265	241
Detailed Design, ...	Relevant	266 = 36%	302 = 40%	310 = 38%	311 = 36%	305 = 36%	368 = 34%	356 = 36%	329 = 35%
	Concluded	95	121	119	112	111	125	128	114
Land Acquisition	Relevant	173 = 34%	186 = 25%	197 = 26%	198 = 27%	195 = 27%	218 = 27%	215 = 29%	202 = 28%
	Completed	59	46	51	55	52	59	63	56
EIA	Relevant	176 = 65%	217 = 40%	252 = 38%	258 = 36%	255 = 35%	286 = 35%	274 = 37%	253 = 35%
	Approved	114	87	97	94	90	101	102	89
CBA	Relevant	200 = 67%	191 = 82%	239 = 74%	241 = 73%	253 = 77%	275 = 76%	268 = 78%	238 = 76%
	Performed	133	156	177	177	195	208	208	181
Final Approval	Relevant	205 = 29%	289 = 36%	327 = 37%	324 = 34%	323 = 37%	395 = 40%	384 = 31%	357 = 36%
	Approved	60	103	121	110	119	157	118	127

Source: tplan analysis based on project list 2021 updated at March 2022

Table 4 and Figure 5 compile the absolute number as well as the share of the highest maturity level for each of the seven investigated parameters. These values refer to those 466 projects that were planned or ongoing by the reference date of the 2022 project list (31.12.2021), each cleared by the "not necessary" (incl. empty) data entries.

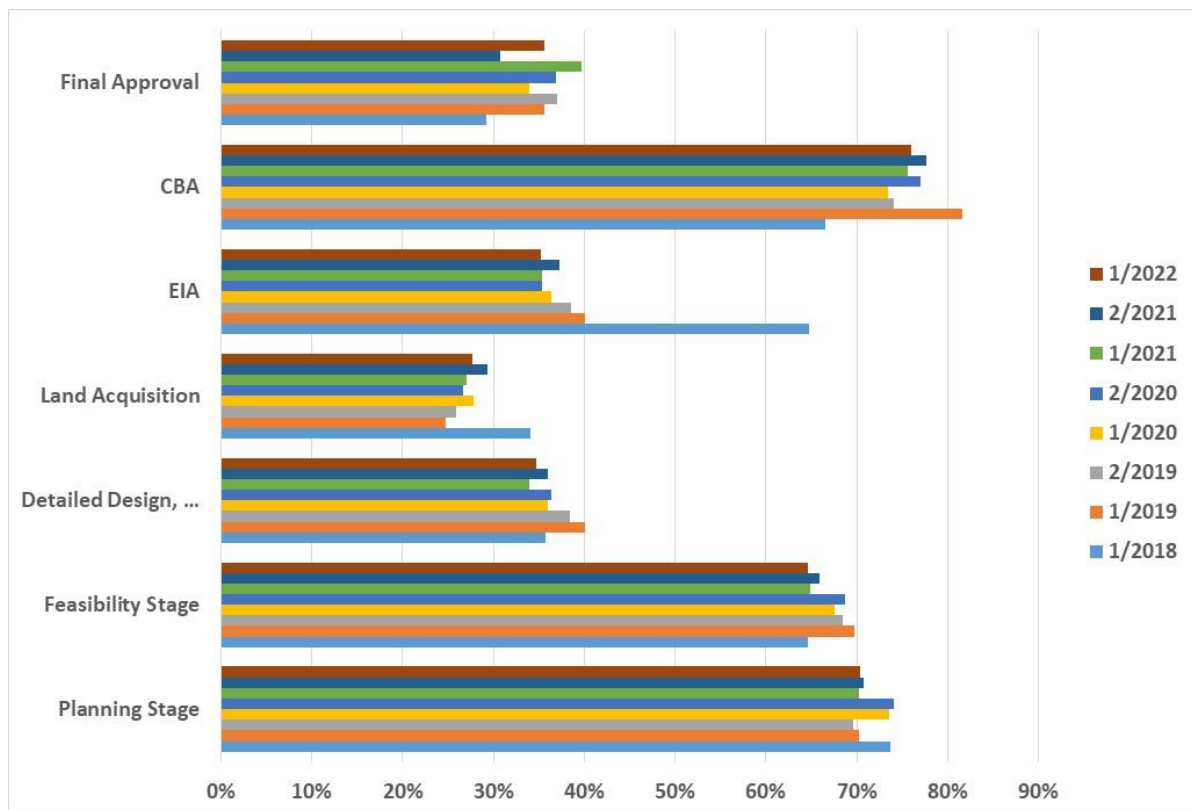
As Table 4 shows, the share of "relevant" projects (i.e. the relation of the relevant projects to the number of ongoing/planned projects) increased for all the parameters

compared to the first PIR in September 2018, it is however lower compared to PIR 2/2021. This is a result of significant number of projects added to the project list over the course of the study and number of projects completed since the last PIR 2/2021, and not included in the analysis any more. The shares indicate some progress regarding the analysed maturity parameters, especially the final approval.

Figure 5 also indicates that most of the highest maturity levels show some variations compared to PIR 1/2018 and PIR 2/2022. Again, "Planning stage", "Feasibility stage" and "CBA" show particularly high maturity grades. The low maturity level of "land acquisition", "Detailed Design" and "EIA" is plausible as well, as this issue tends to be long-lasting and complicated in many projects. All these parameters show slightly lower results in relative terms, than the ones presented in the PIR 2/2021.

On the other hand, the "Final project approval by relevant governmental & administrative authorities" increased compared to PIR 2/2021 and reached the level of 36%. A cross-check with the planned start-date of the projects with a lower maturity level reveals that about 39% of these projects have indeed not started yet (related to the reference date 31.12.2021); pending final decisions by the authorities are therefore plausible.

Figure 5 Status and evolution of maturity parameters (share of projects with highest maturity level by parameter)



Source: tplan analysis based on project list 2021 updated at March 2022

Compared to the first PIR 1/2018, the parameters presented in the PIR 1/2022 appear to show some higher maturity, in particular for the "Planning stage", "Feasibility stage", "CBA" as well as "Detailed Design", but also with reference to "Final Approval". This is mainly due to continuity of project implementation observed in the project list, for major infrastructure projects.

4 Monitoring of Project Finance

This chapter presents the results of the monitoring of the project financial status where two groups of parameters are relevant:

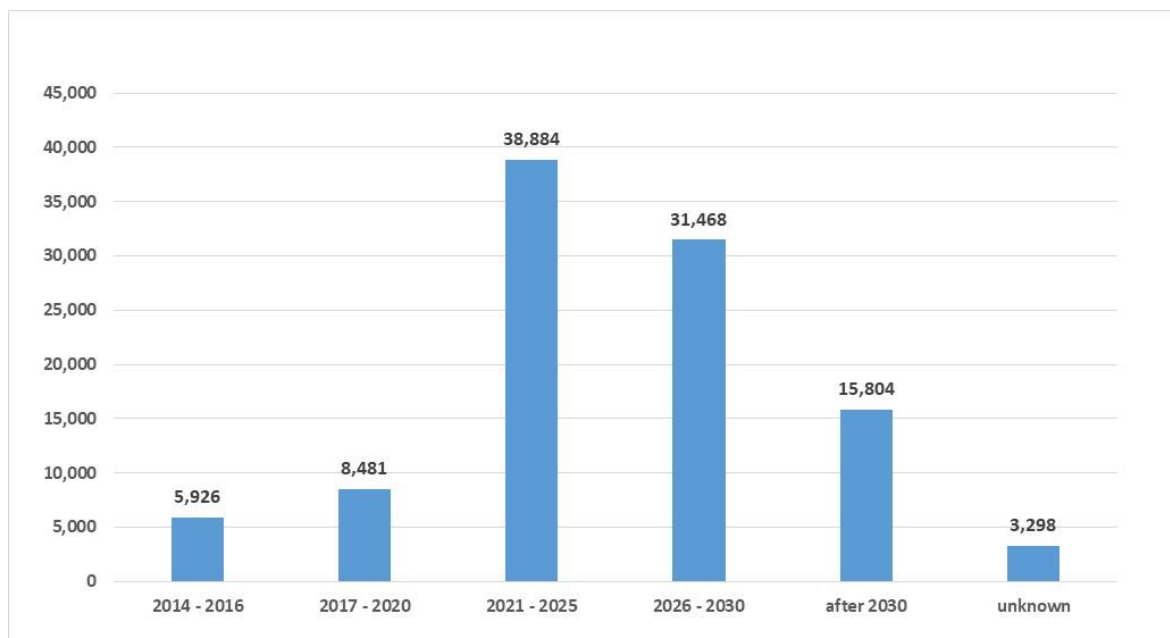
- The total costs by completion time cluster; and
- Other project finance parameters.

These results are based on the 2021 project list of the BA Corridor updated in March 2022.

4.1 Completion Time Cluster

The most important “financing” parameter is the amount of total project costs. The following figure visualises the distribution of the known total costs to the envisaged completion time of the projects.

Figure 6 Total project costs by completion time cluster (total = € 103.9 bn)



Source: tplan analysis based on project list 2021 updated at March 2022

In total, the project costs of the project list sum up € 103.9 bn. This figure represents “official values” of 768 projects, validated by the stakeholders. In turn, for 26 projects no official cost figures are available.

The total official project costs are nearly the same (increased by approximately € 411 million) compared to the June 2021 project list (PIR 2/2021). The total average costs per project amounting to € 135 mln, is the same as in PIR 2/2021 and slightly higher than in PIR 1/2018 (€ 131 mln).

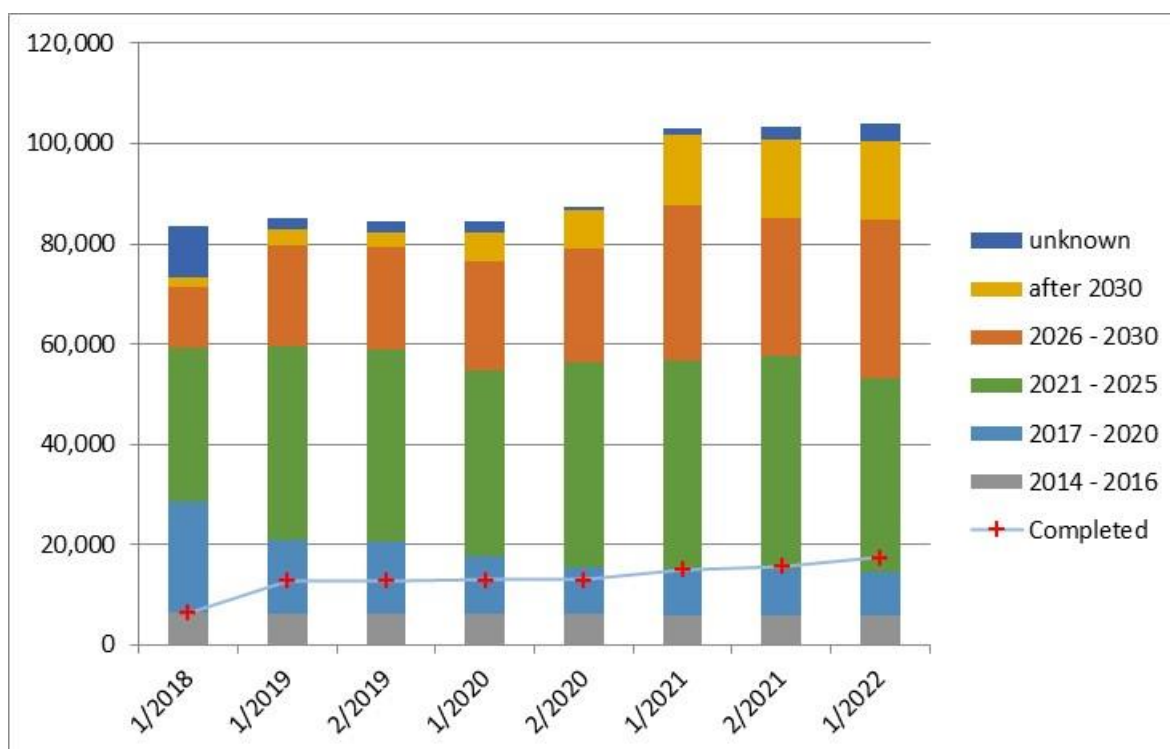
However, the project specific costs show a large variety, ranging from € 5,000 up to € 6 bn. Particularly Innovation, Multimodal, Airport and IWW projects are mostly assigned to the lower costs’ classes (majority of projects do not exceed € 100 mln). In contrast, projects with more than € 100 mln of investment are mainly represented by Rail, Road and Maritime initiatives. In total, about 46% of the overall projects’ costs refer to Rail, followed by Road (28%) and Maritime transport (17%).

Similarly to the analysis of the number of projects, the review of the investment costs and their allocation to the completion time clusters are captured in a tabular (see Table 5) and graphic way, the latter based on the absolute costs (Figure 7) and on the standardised values (showing the relative share cumulating to 100% (see Figure 8).

Table 5 Monitoring the official project costs by completion time cluster since the first Implementation Report [mln EUR]

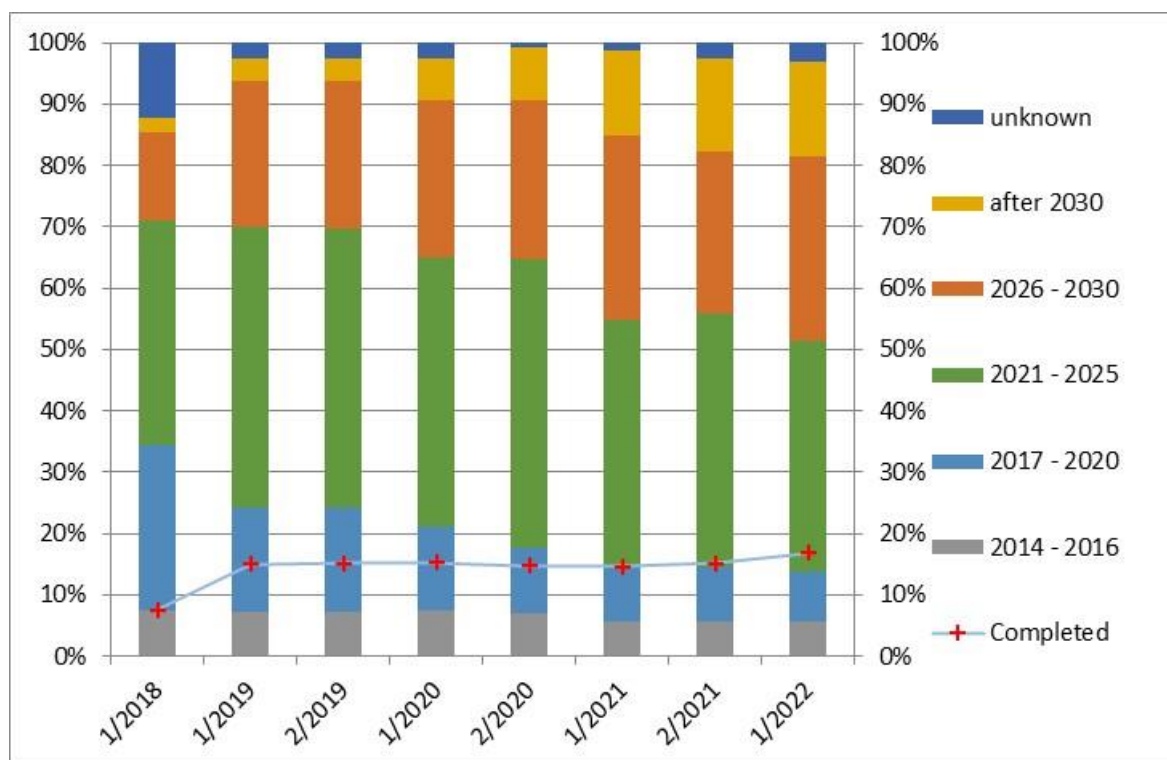
Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022
List Status	06/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021
2014 - 2016	6,355	6,176	6,144	6,227	6,052	5,927	5,924	5,926
2017 - 2020	22,279	14,539	14,312	11,493	9,341	9,154	9,062	8,481
2021 - 2025	30,707	38,873	38,510	37,078	41,110	41,609	42,767	38,884
2026 - 2030	11,972	20,154	20,310	21,543	22,540	30,934	27,337	31,468
after 2030	1,997	3,000	3,000	5,931	7,625	14,261	15,650	15,804
unknown	10,141	2,281	2,276	2,071	639	1,292	2,709	3,298
Total	83,450	85,023	84,551	84,344	87,307	103,176	103,450	103,861
Thereof completed	6,355	12,802	12,769	12,942	12,878	15,080	15,637	17,481

Source: tplan analysis based on project list 2021 updated at March 2022

Figure 7 Graphical presentation of finance criterion “project costs (official)” by completion time in the Implementation Reports [mln EUR]


Source: tplan analysis based on project list 2021 updated at March 2022

Figure 8 Graphical presentation of finance criterion “project costs (official)” in the Implementation Reports [share of completion time clusters]



Source: tplan analysis based on project list 2021 updated at March 2022

Compared to the first PIR 1/2018 and the subsequent PIRs, the following main developments are observed:

- In general, the cost time clusters show the same tendency as the completion time ones: a general shift from 2017-2020 towards the subsequent time clusters. Against the PIR 1/2018, the cost peak moved from 2021-2025 to 2026-2030. Similarly, very clear tendency can also be observed in the PIR 1/2022. The reason is related to partial prolongation of already existing projects, with approximately 15% of projects expected to be completed after 2030, which is the same as registered in the PIR 2/2021;
- Costs allocated to projects with late finalisation (2026-2030, after 2030) refer mostly to Rail (45% share), Road (25%) and Maritime (19% share);
- Similarly to PIR 2/2021, about 68% of the known overall project costs are expected to be incurred between 2021 and 2030, against 82% noted in PIR 1/2021 and 51% observed in the PIR 1/2018. Compared to the number of projects by completion time (Figure 2), the peak values of the cost diagram are about five to ten years later. This is according to expectation, since expensive projects normally show longer project durations;
- Completed projects account for 17% (higher than 15% as reported in PIR 2/2021) of the overall projects' costs, compared to 8% in PIR 1/2018. The share of completed projects in financial terms (17%) is clearly below the share of completed projects in absolute number (39%) (see Chapter 3.1). This fact is due to the completion of small size projects (including many CEF studies for infrastructure development projects and/or studies with pilot initiatives related to deployment of ICT, ITS and alternative clean fuels). It seems also confirming the general trend that investment needs are not evenly distributed over time, but more and more shifted towards 2030;
- In the 2017 project list (basis for PIR 1/2018), the costs of ongoing and planned projects resulted in an average annual investment need of € 5.5 bn until 2030. For

the PIR 2/2020, this figure was slightly higher, equalling € 6.1 bn per annum. It increased for the PIR 1/2021, reaching approximately € 7.2 per annum, and it remained at the same level for the PIR 2/2021. It increased up to nearly € 7.5 for PIR 1/2022. This means that predominantly state budgets and EU programmes will have to cope with relatively stable and increasing funding needs in the future, if all projects shall be realised until 2030;

- Costs of projects for which the completion time is not known, decreased from € 10.1 bn (PIR 1/2018) to € 2.3 bn (1/2019 and 2/2019), to € 2.1 bn in PIR 1/2020, to € 0.6 bn in PIR 2/2020 and increased up to € 1.3 bn in PIR 1/2021 and up to € 2.7 bn in PIR 2/2021 and finally up to € 3.3 bn in PIR 1/2022; the share of these projects on the total costs decreased from 12% (PIR 1/2018) to 3% (PIR 1/2022).

4.2 Other Project Finance Parameters

Similarly to the maturity parameters (see Chapter 3.2), also the finance parameters were subject of harmonisation procedure, performed within the PIR 1/2018 and continued in subsequent PIRs, including the present one. The following table provides an overview of these standard values, which are embedded in the project list structure as selection lists (dropdown lists). In addition, empty fields associated with funding sources were interpreted as potential to the purposes of the analysis presented in this report. The table below summarises the main assumptions adopted to “clear” the information provided in the project list for the analysis of the finance parameters in the project list.

Table 6 Finance parameters - allowed and harmonised values

Parameter PL columns CL- DJ		Allowed values	Values harmonised/ interpretation
	Total costs (official)	Free entry [mln €] [empty]	Free entry [mln €] unknown
	Total costs (estimated)	Free entry [mln €] [empty]	Free entry [mln €] [empty] / unknown
	Explanation of project costs	Free text	Free text
	Project with potential revenues	3 standard entries: - yes - no - unknown [empty]	3 standard entries: - yes - no - unknown [empty] / unknown
	Explanation on potential revenues	Free text	Free text
	Expenditures until reference time of information	Free entry [mln €] [empty]	Free entry [mln €] [empty] / Unknown, not applicable
Funding source "State"	Amount in Million Euro	Free entry [mln €]	Free entry [mln €]
	Funding programme name	Free text	Free text
	Indicate potential or approved funding	2 standard entries: - approved - potential [empty]	2 standard entries: - approved - potential [empty] / Unknown, not applicable
Funding source "Regional /Local"	Amount in Million Euro	Free entry [mln €]	Free entry [mln €]
	Funding programme name	Free text	Free text
	Indicate potential or approved funding	2 standard entries: - approved - potential [empty]	2 standard entries: - approved - potential [empty] / Unknown, not applicable

Funding source "EU"	Amount in Million Euro	Free entry [mln €]	Free entry [mln €]
	Funding programme name e.g. TEN-T funding, ERDF, CEF, ...	4 standard entries: - CEF/TEN-T - ESIF (ERDF, CF, ...) - Other - Unknown	4 standard entries: - CEF/TEN-T - ESIF (ERDF, CF, ...) - Other - Unknown
		[empty]	[empty] / unknown
	Indicate potential or approved funding	2 standard entries: - approved - potential	2 standard entries: - approved - potential
		[empty]	[empty] / Unknown, not applicable
Funding source "IFI"	Amount in Million Euro	Free entry [mln €]	Free entry [mln €]
	Funding programme name	Free text	Free text
	Indicate potential or approved funding	2 standard entries: - approved - potential	2 standard entries: - approved - potential
		[empty]	[empty] / Unknown, not applicable
Funding source "Private"	Amount in Million Euro	Free entry [mln €]	Free entry [mln €]
	Funding programme name	Free text	Free text
	Indicate potential or approved funding	2 standard entries: - approved - potential	2 standard entries: - approved - potential
		[empty]	[empty] / Unknown, not applicable
Funding source "Other"	Amount in Million Euro	Free entry [mln €]	Free entry [mln €]
	Funding programme name	Free text	Free text
	Indicate potential or approved funding	2 standard entries: - approved - potential	2 standard entries: - approved - potential
		[empty]	[empty] / Unknown, not applicable

The following exhibits show the results of the analysis related to the allocation of the official project costs to the financing and funding sources, regardless whether this financing was classified as "approved", "potential" or "unknown". The results of this analysis are shown in a tabular overview (Table 7) as well as in two graphic presentations (Figure 9, Figure 10).

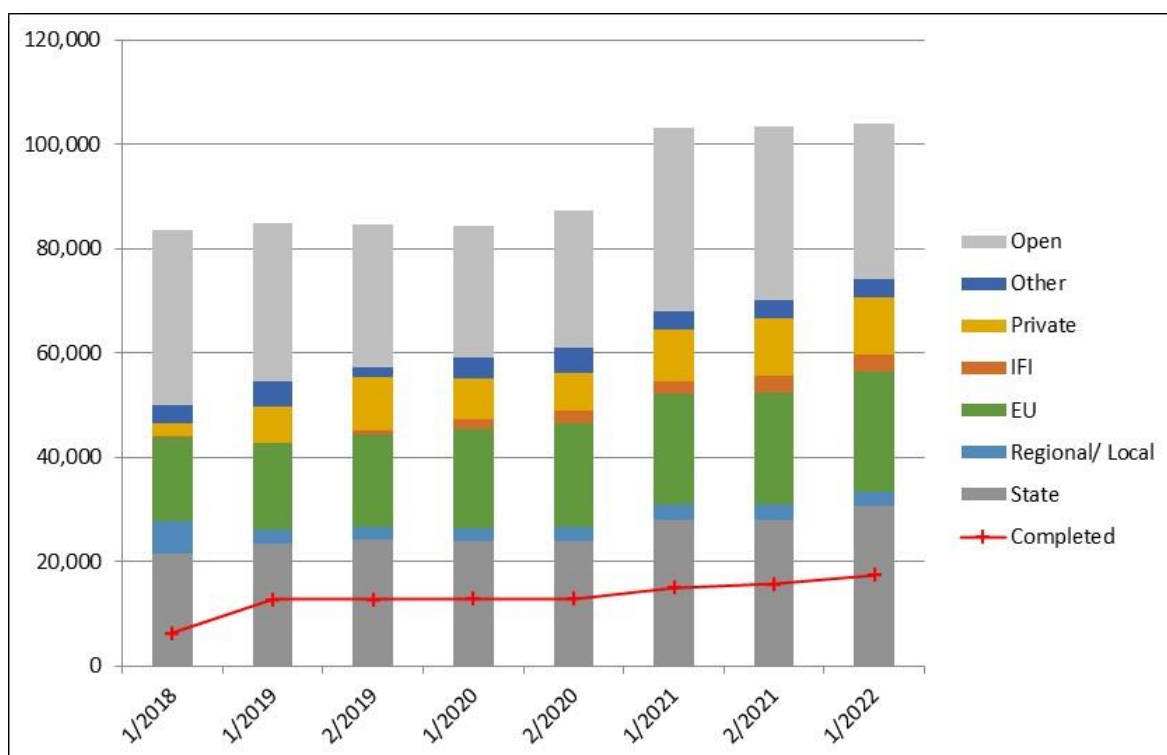
As Table 7 overleaf indicates, state budgets (29%) and EU funding (22%) are the main contributors to the project cost coverage. Compared to the PIR 1/2018 the share of state as well as EU financing increased by 3% in both categories; and in comparison to the PIR 2/2021 it increased slightly for state budget (from 27% in the PIR 2/2021); and it increased by 1% for the EU. Beyond this, "Private" financing is at the same level compared to PIR 2/2021 and accounts for 11% share of the overall financing. Furthermore, "Regional/local" financing plays only a minor role (3%) and its share is stable compared to the PIR 2/2021, the same as the "Other" category, which accounts for 3% similarly to PIR 2/2021. Finally, "IFI financing" also remains stable at the level of 3% in PIR 1/2022 as in PIR 2/2021. 29% of the official project costs are not assigned to any financing source, which is lower than 32% in PIR 2/2021 and less than 40% in PIR 1/2018.

Table 7 Status of project financing sources (official costs only) [€ mln]

Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022
List Status	06/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021
State	21,571	23,375	24,257	23,936	24,003	28,062	27,974	30,618
Regional/local	6,129	2,701	2,337	2,560	2,667	2,819	2,826	2,825
EU	16,201	16,612	17,861	18,857	19,815	21,199	21,477	22,910
IFI	314	184	814	2,028	2,511	2,556	3,303	3,286
Private	2,314	6,890	10,075	7,613	7,225	9,853	10,924	11,016
Other	3,329	4,851	2,008	4,106	4,846	3,464	3,581	3,510
Open	33,592	30,410	27,200	25,244	26,240	35,223	33,364	29,696
Total official costs	83,450	85,023	84,552	84,344	87,307	103,176	103,450	103,861
Thereof completed	6,355	12,802	12,769	12,942	12,878	15,080	15,637	17,481

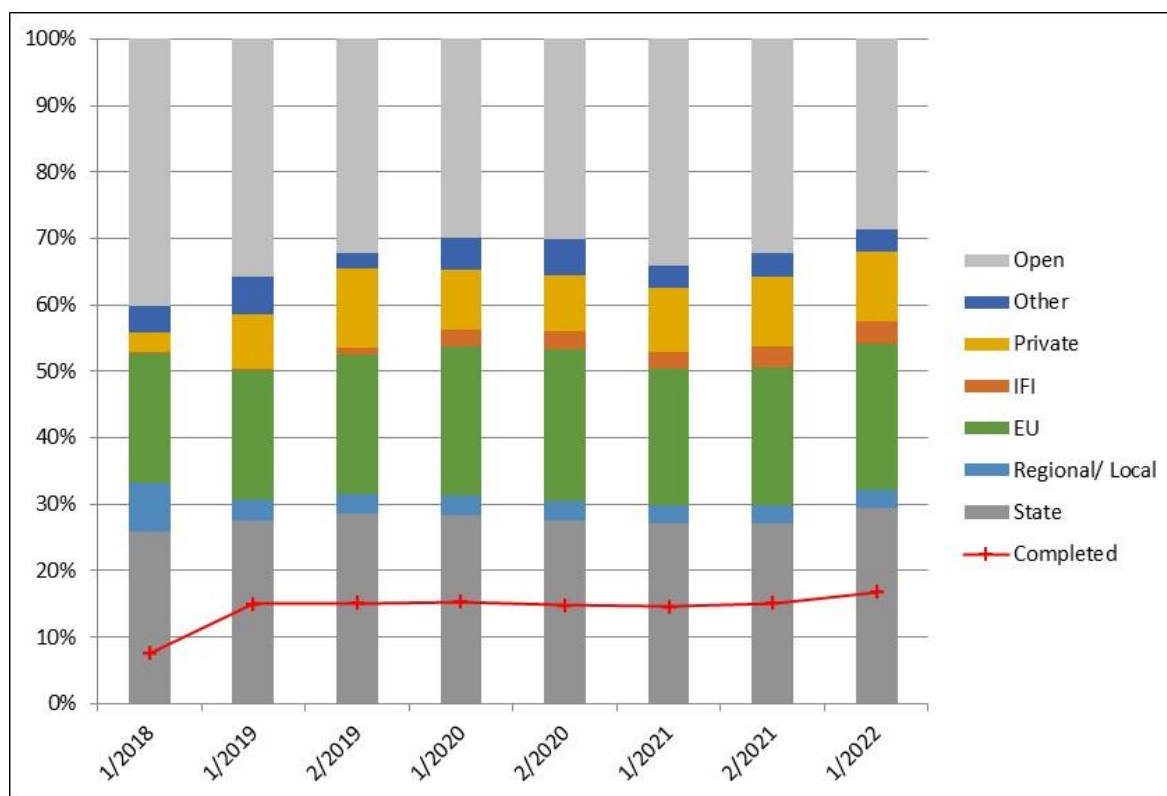
Source: tplan analysis based on project list 2021 updated at March 2022

Figure 9 and Figure 10 visualise these developments in absolute and relative values. The diagrams illustrate the overall increase over time of state and EU funds as well as private sources of financing, meaning that higher number of projects have their financing source defined. Also, open sources of financing have decreased. It is however worth underlining that the comparison between the PIR 1/2018 and PIR 1/2022 is based on different number of projects, due to the complete update of the project list in 2021, and most likely not all of the newly added initiatives have their financing sources defined.

Figure 9 Evolution of project financing sources and value of completed projects (official costs only) [€ mln]


Source: tplan analysis based on project list 2021 updated at March 2022

Figure 10 Shares of project financing sources [shares] and value of completed projects (official costs only)



Source: tplan analysis based on project list 2021 updated at March 2022

As already shown for the analysis of the maturity parameters, the highest level of financing commitment is an important indicator for the evaluation of the projects' implementation. Regarding financing, this is expressed by the share of "approved" financing. This analysis excludes completed projects, as these projects must have already been financed completely. Thus, the calculation comprises the following steps:

- the total cost of projects is provided (as a reference);
- only projects with "official" costs are considered;
- the total costs of ongoing or planned projects is provided (clear marking of MM/YYYY, which distinguished "completed" projects) = "relevant costs";
- for each financing source the total value is provided as a reference;
- for each financing source the total value of "approved" finance is calculated in value;
- and finally the Ratio $E / D * 100$ can be calculated to demonstrate the financial status per financial source.

The application of this procedure to the projects relevant for the development of the BA Corridor reveals the approval rates as displayed in Table 10 and Figure 11.

- The overall "official" costs of the ongoing and planned projects decreased from € 77.1 bn (PIR 1/2018) to € 72.2 bn (PIR 1/2019), € 71.8 bn (PIR 2/2019), € 70.7 bn (PIR 1/2020), and increased to € 74.4 bn (PIR 2/2020) and further to € 88.1 bn in PIR 1/2021, then it decreased to € 87.8 bn in the PIR 2/2021 and finally slightly decreased to € 86.4 bn in the current PIR 1/2022, mainly due to completion of some projects during the current update of the project list, as well as to costs' amendments undertaken in the recent project list update;

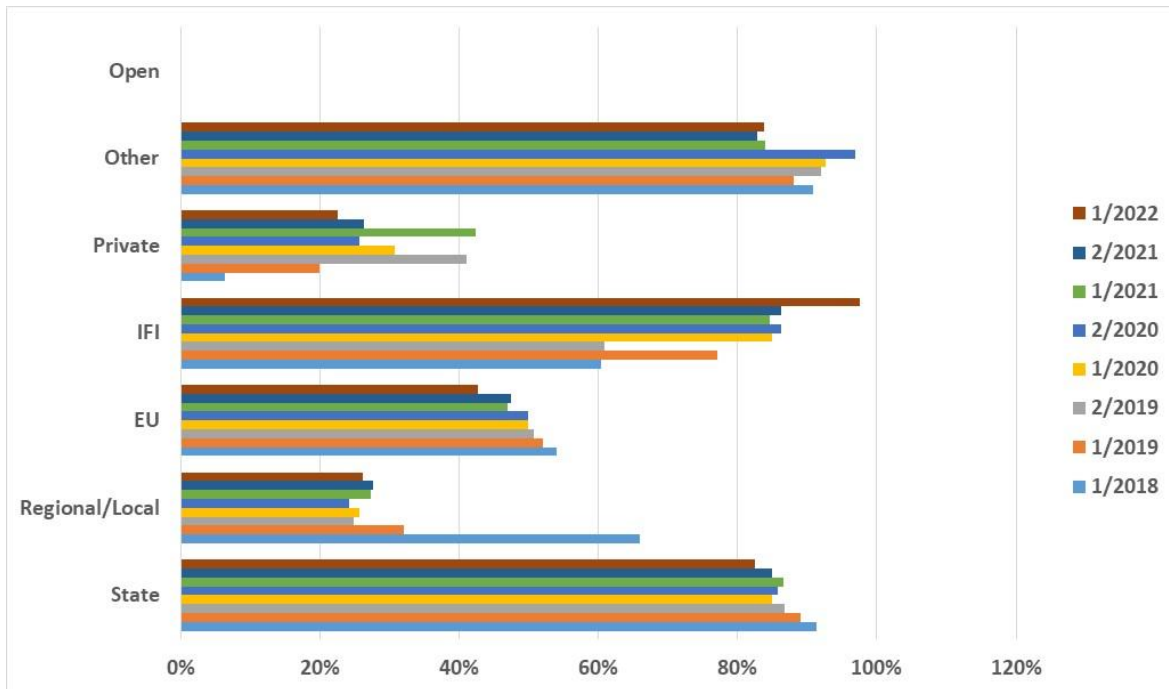
- In total, the approval rate of the funds remains stable since the last PIR. € 35 bn of the “relevant” costs are covered by “approved” funding, following reporting by the project promoters in the last project list update of 2022. This means that 40% of the official costs are currently covered by reliable funding commitments, compared to 34% in PIR 1/2018, 40% in PIR 1/2019, 42% in PIR 2/2019, 44% in PIR 1/2020, 44% in PIR 2/2020, 41% in PIR 1/2021 and 40% in PIR 2/2021;
- In turn, 60% of the planned/ongoing projects’ official costs are either not financed, or the financing has not been approved yet, or no information about funding approval has been provided;
- The increase of approval in absolute values refers to categories “State” and “EU”, for the other financing sources decrease is noticeable (resulting from moving some projects to the completed section as well as moving some of the projects to other categories of financing). Particularly EU funding has been approved for more projects in the meantime.

Table 8 Share of “approved” financing of official project costs by source on the CNC Baltic-Adriatic

Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022
List Status	06/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021
Total official costs [mln EUR] thereof:	83,450	85,023	84,552	84,344	87,307	103,176	103,450	103,861
- completed projects	6,355	12,802	12,769	12,942	12,878	15,080	15,637	17,481
- ongoing or planned projects	77,095	72,222	71,803	70,718	74,429	88,095	87,813	86,379
State								
- Relevant costs [mln EUR]	17,354	20,143	21,007	20,442	21,069	24,820	25,338	27,207
- thereof covered by “approved” financing	91%	89%	87%	89%	86%	87%	85%	82%
Regional/local								
- Relevant costs [mln EUR]	5,075	2,466	2,109	2,247	2,352	2,432	2,446	2,397
- thereof covered by “approved” financing	66%	32%	25%	32%	24%	27%	28%	26%
EU								
- Relevant costs [mln EUR]	10,353	11,320	12,575	13,513	15,114	15,103	15,225	15,985
- thereof covered by “approved” financing	54%	52%	51%	52%	50%	47%	47%	43%
IFI								
- Relevant costs [mln EUR]	199	184	814	2,028	2,221	2,243	2,270	2,039
- thereof covered by “approved” financing	60%	77%	61%	77%	86%	85%	86%	98%
Private								
- Relevant costs [mln EUR]	2,265	6,612	9,195	6,619	6,210	8,719	8,181	7,808
- thereof covered by “approved” financing	6%	20%	41%	20%	26%	42%	26%	22%
Other								
- Relevant costs [mln EUR]	1,422	3,543	1,070	3,126	3,486	1,653	1,761	1,555
- thereof covered by “approved” financing	91%	88%	92%	88%	97%	84%	83%	84%
Open								
- Relevant costs [mln EUR]	40,428	27,935	25,453	22,743	23,977	33,126	32,593	29,388
- thereof covered by “approved” financing	0%	0%	0%	0%	0%	0%	0%	0%
Total								
- Relevant costs [mln EUR]	77,095	72,222	71,803	70,718	74,429	88,095	87,813	86,379
- thereof covered by “approved” financing	34%	40%	42%	44%	44%	41%	40%	40%

Source: tplan analysis based on project list 2021 updated at March 2022

Figure 11 Evolution of share of “approved” financing by source on the CNC Baltic-Adriatic



Source: tplan analysis based on project list 2021 updated at March 2022

5 Monitoring of difficulties

This chapter provides results on the monitoring of difficulties jeopardising the completion of the BA Corridor at standard by 2030, possibly requesting action by the European Coordinator.

5.1 Project affected by implementation issues jeopardising the completion of the Corridor by 2030

According to the methodology defined to respond to the above question, as part of the updating process of the project list, project promoters are asked to state any difficulty in the implementation of a specific project by answering the following questions for each investment included in the list (Columns CJ and CK on the project list):

- Does (a/this) project have any difficulty jeopardising the completion of the Corridor by 2030 and where you are requesting action from the European Coordinator?
"If yes:
- Please describe the nature of the difficulty, why it jeopardizes the completion of the Corridor as well as why and how the European Coordinator should act."

The relevance of the above question affects specifically those projects that are required to complete the corridor at standard by 2030 (i.e. impacting on corridor's Key Performance Indicators – KPIs) and the assessment under this chapter shall focus on this target.

The 2021 project list updated in March 2022 includes indications from the project promoters concerning problems jeopardising the completion of the BA Corridor by 2030, for the following four projects, also impacting on KPIs:

- 1049 Works on railway line no. 139, section Czechowice Dziedzice - Bielsko Biała - Zwardoń (state border);
- 1044 Works on railway line E 59, section Kędzierzyn Koźle - Chałupki (state border);
- 1076 Ostrava node modernisation;
- 9739 Construction of the LNG Terminal in public port of Bratislava.

As indicated by the project promoters as presenting difficulties jeopardising the completion of the Corridor by 2030, the first two cross-border initiatives face possible risk of implementation due to reduced available financial resources. The Ostrava node modernisation will be completed only in 2033, and the construction of the LNG Terminal in the public port of Bratislava experienced some issues in the timely completion of the EIA, therefore the project was prolonged until 2023. The promoters do not mention whether they need the support of the European Coordinator to solve project development and implementation difficulties, albeit in case of the last project it has been specified that no EC support is necessary, as in fact the completion of the investment is envisaged to occur well before 2030.

The first three projects are located along the itinerary of the critical cross-border sections between Poland and the Slovak Republic (1049) and between Poland and the Czech Republic (1044 and 1076). By reviewing the project maturity and financial parameters of these initiatives, it is noticed that the project for the modernisation of the Ostrava node is currently envisaged to be completed after 2030, whereas the projects on the Polish side do not have implementation dates defined. These three projects and particularly projects 1049 and 1044 are already monitored by the European Coordinator as part of the activities related to the assessment of the progresses of the critical cross-border sections, which are a priority of the work plan, together with the development of the integration and interconnection of the corridor at core urban nodes, including in the Ostrava node. Particularly for the projects related to the cross-border sections, meetings with the concerned project promoters may be organised to better understand the status of the development of these initiatives and

the issues potentially affecting their implementation, as further discussed in the following sections below.

The initiative related to the development of the LNG terminal in the port of Bratislava appears to be affected by low maturity, as costs for such investment are not defined. The Baltic-Adriatic Corridor is very marginally involved in the development of the CNC Inland Waterways (IWW), and it might be more appropriate that this project is monitored and followed by the European Coordinators of the Rhine-Danube or Orient East-Mediterranean CNCs. The European Coordinator of the BA Corridor and her Technical Adviser may coordinate with the other coordinators and their advisers in this regard, as appropriate.

5.2 Project impacting on KPIs that might not be completed by 2030

Other than the projects declared by the project promoters to be affected by implementation issues, the project list actually includes several initiatives which are impacting on the achievement of Key Performance Indicators (KPIs) and thus on the completion of the corridor at standard by 2030, for which a project end date is still to be defined, or that are currently expected to be completed after 2030. These are listed below:

▪ **Rail and rail ERTMS projects:**

- 1049 Works on railway line no. 139, section Czechowice Dziedzice - Bielsko Biała - Zwardoń (state border);
- 1044 Works on railway line E 59, section Kędzierzyn Koźle - Chałupki (state border)
- 1048 Works on main passenger lines (E 30 and E 65) in Śląsk area, phase II: line E 30, section Katowice - Chorzów Batory and Gliwice Łabędy;
- 1527 Works on main passenger lines (E 30 and E 65) in Śląsk area, phase III: line E 30, section Chorzów Batory - Gliwice Łabędy;
- 1076 Ostrava node modernisation;
- 1073 Blažovice - Nezamyslice: railway modernisation to 200 km/h;
- 1917 ETCS at Brno node;
- 9452 Rail Node Bratislava – Works;
- 1098 Upgrade Nordbahn Wien Süßenbrunn – Bernhardsthal;
- 9464 ETCS deployment in ETCS gap between Westbahn and Ostbahn;
- 1144 Upgrading of the section Trieste-Divača (Divača-state border).

▪ **Road projects:**

- 1191 A5 Construction Poysbrunn - Border AT/CZ 2nd Part.

Projects 1527, 1076, 1073 and 1917 concern the modernisation of the critical cross-border section between Katowice-Ostrava-Brno, which in the Czech Republic overlaps with the critical cross-border section Opole-Ostrava-Brno between the two nodes of Ostrava and Brno. Project 9452 refers to the node of Bratislava, which is also involved in many cross-border itineraries of multiple CNCs; whereas project 1144 relates to the modernisation of the critical cross-border section between Venezia and Ljubljana. These projects are monitored as part of the activities organised by the European Coordinator(s) to support the development and implementation of the corridors' cross-border sections. Together with urban nodes projects, cross-border initiatives are more complex to be prepared and implemented, and it is more likely that they are subject of longer development times and implementation delays. By organising dialogues on cross-border sections and at urban nodes, the European Coordinator of the BA Corridor is already giving special attention to these (type of) projects. Projects 1098 and 9464 concern the achievement of the KPIs for train length and ERTMS in Austria on sections that are already at standard concerning the other KPIs, specified that at least for train length the Austrian authorities consider their network at standard under the operational point of view, whereas the deployment of ERTMS is also monitored by

the European Coordinator for the ERTMS horizontal priority. In addition to rail and rail ERTMS initiatives, a road project concerning the completion of the upgrading to two lanes per direction of the road critical cross-border sections between Brno and Wien on the Austrian side, has its completion date after 2030. This initiative, which is strictly related to the progresses of the works on the Czech side, and potential future traffic on the road, is monitored as part of the activities already planned and ongoing by the European Coordinator for the development of the corridor critical cross-border sections.

5.3 Project impacting on KPIs with unknown investment costs

Other than issues related to the completion time of the projects, for the following initiatives included in the project list, also impacting on the achievement of the KPIs, investment costs are unknown at present, indirectly reflecting their low maturity status:

▪ **Rail and rail ERTMS projects:**

- 1070 Upgrade of Brno - Breclav line as a High Speed Rail line;
- 1808 ERTMS deployment Bruck a.d.Mur – Mürzzuschlag;
- 1809 ERTMS deployment Mürzzuschlag – Gloggnitz;
- 1810 ERTMS deployment Gloggnitz - Wiener Neustadt;
- 1838 ERTMS deployment Wien – Marchegg;
- 9414 ERTMS deployment Wien – Parndorf;
- 9415 ERTMS deployment Parndorf – Kittsee / Petrzalka (border AT/SK);
- 1837 ERTMS deployment Wampersdorf – Gramatneusiedl;
- 1836 ERTMS deployment Wampersdorf – Wien;
- 1835 ERTMS deployment Wr. Neustadt – Wampersdorf;
- 1834 ERTMS deployment Graz – Bruck a.d.Mur;
- 1842 ERTMS deployment Werndorf – Graz;
- 1833 ERTMS deployment Sentilj / Spielfeld-Strass (border AT/SLO) – Werndorf;
- 1841 ERTMS deployment Klagenfurt – Werndorf;
- 1840 ERTMS deployment Border AT/IT – Klagenfurt;
- 5674 ERTMS Implementation- Scandinavian-Mediterranean- Completion.

▪ **IWW projects:**

- 9739 Construction of the LNG Terminal in public port of Bratislava.

Project 1070 is impacting on the achievement of the train length parameter along the itinerary of the cross-border section Brno-Wien on the Czech side, whereas all other parameters are already at standard on this line. Project 5674 is related to the achievement of the KPI for ERTMS on several CNC lines in Italy, including sections interconnecting to the port of Ancona on the BA Corridor. The remaining projects are all related to ERTMS deployment in Austria, and, as already mentioned above, they are also monitored by the European Coordinator of the ERTMS horizontal priority. In addition to rail and rail ERTMS projects the initiative for the construction of an LNG terminal in the port of Bratislava is also missing an official cost, which may also be the reason why it has been indicated by the concerned promoter as presenting difficulties jeopardising the completion of the Corridor by 2030. As mentioned above, the Baltic-Adriatic Corridor is very marginally involved in the development of the CNC Inland Waterways (IWW), and it might be more appropriate that this project is monitored and followed by the European Coordinators of the Rhine-Danube or Orient East-Mediterranean CNCs.

For the above listed projects included in the project list without official budgets, and required to reach the KPIs, investment costs have been estimated on the basis of a common methodology adopted by the 2018-2022 CNC Studies Contractors. This methodology is reported in Annex 1 to the Project Implementation Report 2/2019. Based on own estimates, the budget related to these initiatives would amount to

nearly € 2,900 million (see table overleaf). This budget is however including the cost of project 1070, *Upgrade of Brno-Břeclav line as a High Speed Rail line*, totalling nearly € 2,200 million. Albeit impacting on the train length parameter on part of the railway line subject of upgrading, the costs actually required to achieve the 740 meters train length standard would represent a significant lower amount than the one for the modernisation of the line at 200 km/h. The costs for the deployment of ERTMS on the BA Corridor lines is estimated to be slightly more than € 660 million. However this amount also includes the costs of project 5674, amounting to € 360 million, that is only marginally related to the sections of the BA Corridor. Finally, the costs for the construction of the LNG terminal in the port of Bratislava are estimated at about € 50 million.

5.4 Action plan for the completion of the BA Corridor by 2030

In order to provide a better overview of the effectiveness of the project list to support the development of the BA Corridor and its completion by 2030, it is worth referring to the action plan for the development and completion of the BA Corridor as originally elaborated as part of the 2015-2017 study, and updated over the course of the 2018-2022 study. The action plan updated on the basis of the 2021 project list (status at March 2022) is provided in Table 9 below and described in the subsequent paragraphs.

In line with the approach developed as part of the 2015-2017 BA Corridor study, initiatives included in the project list have been grouped by section and node of the corridor and relevant theme of the TEN-T policy as identified in the Regulation (EU) 1315/2013. This exercise results in the definition of a detailed set of actions, that together constitute the action plan for the development of the BA Corridor. The plan includes a description of the actions by transport mode, providing an indication of the impact of each action on the improvement and/or achievement of the KPIs set according to Regulation (EU) 1315/2013. Grouping initiatives by section and node, the plan also allows for the analysis of the impacts of the projects on the synchronised development and implementation of the BA Corridor, which is particularly relevant for cross-border sections. The number of projects by action and the timing of the start and completion of each action, together with the involved Member States is indeed also specified for each action, together with the total budget of the action and the ratio of approved funds to the total cost.

The plan has been updated over the course of the years, adjusting the structure and names of the actions in order to reflect the changes in the project list and in the development of the corridor, and more recently, the extension of the BA Corridor to Kraków in Poland and Ancona in Italy. The action plan currently consists of 90 different actions, including a total of 466 ongoing and planned projects, for an overall budget of € 86,379 million. Among the 90 actions, 4 do not include any initiative at present, namely the three actions relating to the development of the Szczecin, Ostrava, and Bratislava airports and one action concerning the urban node of Wrocław, for which there are no ongoing and planned projects in the list.

To the scope of the analysis subject of this report, dates have been highlighted in orange in the action plan, which relate to those actions that have a direct impact on the completion of the BA Corridor at standard and that are currently envisaged to be completed only after 2030.

Table 9 Action plan for the completion and development of the BA Corridor

GROUP		ACTIONS	MS	IMPACT OF THE ACTION ON KPIS TO ACHIEVE TEN-T REQUIRED STANDARDS	START	END	NUMBER OF PROJECTS	TOTAL BUDGET	% APPROVED FUNDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET	ADDITIONAL PROJECTS REQUIRED TO FULLY REACH STANDARDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET AND OF ADDITIONAL PROJECTS TO REACH KPIS			
1	Railways	1.1 Cross-border	1.1.01	Upgrading of the corridor cross-border connection: Katowice (PL) – Ostrava (CZ) – Brno (CZ), between Katowice and Ostrava	PL	Line Speed, Train Length	2022	2026	4	1.542,6	8%	0,0	0	0,0	
			1.1.02	Upgrading of the corridor cross-border connection: Opole (PL) – Ostrava (CZ) – Brno (CZ), between Opole and Ostrava	PL	Line Speed, Train Length	2022	2023	3	223,9	81%	0,0	4	270,2	
			1.1.012	Further upgrading of the cross-border connections Katowice (PL)/Opole (PL) – Ostrava (CZ) – Brno (CZ) in the Czech Republic, including upgrading to HS of the Brno - Přerov (Ostrava) rail line	CZ	Train Length	2022	2031	11	4.459,5	27%	0,0	1	82,3	
			1.1.03	Upgrading of the corridor cross-border connection: Katowice (PL) – Žilina (SK) [Zwardoń (PL) – Skalítě (SK)]	PL, SK	ERTMS, Line Speed, Axle Load, Train Length	2023	2027	3	1.002,8	4%	0,0	2	204,9	
			1.1.04	Further upgrading of the corridor cross-border connection: Brno (CZ) – Wien (Stadlau) (AT)	CZ, AT	Train Length	2030	2032	2	1.006,6	100%	2.188,2	1	2.307,9	
			1.1.05	Upgrading of the corridor cross-border connection: Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)]	SK, AT	Electrification, ERTMS	2023	2024	2	644,3	98%	0,0	1	35,3	
			1.1.06	Upgrading of Railway Cross-Border Connection: Graz (AT) – Maribor (SI)	SI	ERTMS, Line Speed, Axle Load	2023	2030	2	432,3	59%	0,0	0	0,0	
			1.1.07	Upgrading of the corridor cross-border connection: Venezia (IT) - Trieste (IT) - Divača (SI) – Ljubljana (SI), between Trieste and Divača	IT, SI	ERTMS, Train Length, Line Speed	2024	2050	2	116,1	56%	0,0	2	66,2	
			1.1.07.1	Further upgrading of the cross-border connection: Venezia (IT) - Trieste (IT) - Divača (SI) – Ljubljana (SI) on the Italian side up to Venice	IT		2031	2031	1	1.800,0	15%	0,0	0	0,0	
			1.1.07.2	Further upgrading of the cross-border connection: Venezia (IT) - Trieste (IT) - Divača (SI) – Ljubljana (SI) on the Slovenian side up to Ljubljana	SI	Line Speed	2023	2024	2	253,0	22%	0,0	0	0,0	
		1.2	Missing links	1.2.01	Alpine Rail Crossings (Semmering Base Tunnel, Koralm railway line and tunnel)	AT	Electrification, ERTMS, Line Speed, Axle Load, Train Length	2025	2028	2	9.660,8	100%	0,0	0	0,0
				1.2.02	Second track of the Koper - Divača railway line	SI	Electrification, ERTMS, Line Speed, Axle Load, Train Length	2025	2025	1	1.194,0	89%	0,0	0	0,0
		1.3	Modernization and upgrading of the national railway networks	1.3.04	Upgrading and modernization of the Corridor lines in Poland	PL	ERTMS, Line Speed, Axle Load, Train Length	2022	2030	13	3.300,4	74%	0,0	2	414,0
				1.3.09	Upgrading of the corridor lines in the Czech Republic (including the Brno node)	CZ	ERTMS, Line Speed, Train Length	2024	2030	2	1.766,0	0%	0,0	1	39,4
				1.3.07	Upgrading of the Corridor lines in Slovakia	SK	ERTMS, Line Speed, Train Length	2022	2024	2	685,0	53%	0,0	0	0,0
				1.3.08	Upgrading of the Corridor lines and stations reconfiguration in Austria	AT	ERTMS	2023	2034	9	2.867,3	100%	0,0	0	0,0
				1.3.12	Upgrading of the Corridor lines in Italy	IT	Train Length	2024	2030	10	1.655,9	65%	0,0	0	0,0
				1.3.13	Upgrading and modernisation of the Corridor lines in Slovenia	SI	Line Speed, Axle Load (Pragersko Railway Station)	2022	2030	3	281,8	53%	0,0	2	423,9
		1.4	Technological upgrades, telematics applications (including ERTMS), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34,	1.4.01	ERTMS deployment on the Baltic - Adriatic corridor	PL, CZ, SK, AT, IT, SI	ERTMS	2022	2031	26	1.580,5	54%	660,9	0	660,9
				1.4.07	Horizontal measures for the deployment of ERTMS	MULTI-COUNTRY		2022	2025	7	138,6	96%	0,0	0	0,0

GROUP				ACTIONS		MS	IMPACT OF THE ACTION ON KPIS TO ACHIEVE TEN-T REQUIRED STANDARDS	START	END	NUMBER OF PROJECTS	TOTAL BUDGET	% APPROVED FUNDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET	ADDITIONAL PROJECTS REQUIRED TO FULLY REACH STANDARDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET AND OF ADDITIONAL PROJECTS TO REACH KPIS	
	1,5	35, 37) Other operational or service improvements		1.5.01	Other operational or service improvements	MULTI-COUNTRY		2022	2023	4	205,7	12%	0,0	0	0,0	
2	2,1	Cross-border		2.1.01	Road section Katowice (PL) – Žilina (SK)	PL, SK	Express road/motorway	2023	2030	5	1.826,8	67%	0,0	0	0,0	
				2.1.02	Brno (CZ) – Wien (AT): Road section Pohořelice (CZ) – Schrick (AT)	CZ, AT	Express road/motorway	2030	2031	2	462,9	18%	0,0	0	0,0	
				2.1.03	Road section Trieste (IT) - Sežana (SI)	IT, SI		2024	2030	2	19,9	0%	0,0	0	0,0	
	2,2	Completion and upgrading of the national road networks		2.2.03	Completion of the Corridor road network in Poland (S3, A4, A1 and S7)	PL	Express road/motorway	2022	2030	8	5.503,4	22%	0,0	0	0,0	
				2.2.05	Completion of the Corridor road network in the Czech republic (D1)	CZ	Express road/motorway	2026	2032	3	661,5	44%	0,0	0	0,0	
				2.2.06	Upgrading of the Corridor road network in Slovakia (D1 and D3)	SK		2025	2033	3	271,9	71%	0,0	0	0,0	
				2.2.07	Upgrading of the Corridor road network in Austria (A2 and A4)	AT		2022	2027	3	253,3	100%	0,0	0	0,0	
				2.2.08	Upgrading of the Corridor road network in Italy (R.A. 13 and A14, A4, A14)	IT, SI		2022	2028	17	1.805,6	38%	0,0	0	0,0	
				2.2.09	Upgrading of the Corridor road network in Slovenia	SI		2022	2025	8	233,1	41%	0,0	0	0,0	
				2.3	Telematics applications (including ITS and ETC), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)		2.3.01	Deployment of ITS and other telematics applications in the Corridor Member States	CZ, AT, IT, SI		2022	2026	12	2.044,7	15%	0,0
					2.3.02	Development of alternative clean fuels in the Corridor Member States	PL, CZ, SK, IT	Availability of clean fuels	2022	2026	18	1.951,7	4%	0,0	0	0,0
					2.3.05	Development of safe and secure parking areas in the Corridor Member States	IT		2024	2024	1	27,5	100%	0,0	0	0,0
					2.3.03	Cross-corridors and multi-country ITS and other telematics application measures	MULTI-COUNTRY		2022	2023	3	309,7	62%	0,0	0	0,0
					2.3.04	Cross-corridors and multi-country alternative clean fuel measures	MULTI-COUNTRY	Availability of clean fuels	2022	2023	6	326,8	100%	0,0	0	0,0
3	3,1	Developing hinterland interconnections inside and outside port areas		3.1.01	Development of interconnections: Port of Gdynia	PL		2027	2030	4	696,4	0%	0,0	0	0,0	
				3.1.02	Development of interconnections: Port of Gdańsk	PL		2022	2023	4	472,1	95%	0,0	0	0,0	
				3.1.03	Development of interconnections: Ports of Szczecin and Świnoujście	PL		2022	2024	4	376,8	95%	0,0	0	0,0	
				3.1.04	Development of interconnections: Port of Trieste	IT		2023	2026	3	151,1	83%	0,0	0	0,0	
				3.1.05	Development of interconnections: Port of Venice	IT		2023	2030	10	175,2	20%	0,0	0	0,0	
				3.1.06	Development of interconnections: Port of Ravenna	IT		2024	2026	3	113,1	90%	0,0	0	0,0	
				3.1.08	Development of interconnections: Port of Ancona	IT		2025	2025	1	12,0	100%	0,0	0	0,0	
		3.1.07	Development of interconnections: Port of Koper	SI		2024	2031	3	294,8	0%	0,0	0	0,0			
	3,2	Modernization / Expansion of the infrastructure		3.2.01	Infrastructure development: Port of Gdynia	PL	Availability of clean fuels	2022	2027	14	1.662,9	18%	0,0	0	0,0	
				3.2.02	Infrastructure development: Port of Gdańsk	PL		2022	2040	9	3.833,8	8%	0,0	0	0,0	
				3.2.03	Infrastructure development: Ports of Szczecin and Świnoujście	PL		2022	2027	10	1.417,9	43%	0,0	0	0,0	
				3.2.04	Infrastructure development: Port of Trieste	IT		2023	2026	6	561,0	1%	0,0	0	0,0	
				3.2.05	Infrastructure development: Port of Venice	IT		2023	2026	10	2.924,7	8%	0,0	0	0,0	
				3.2.06	Infrastructure development: Port of Ravenna	IT		2024	2027	4	392,4	73%	0,0	0	0,0	
				3.2.08	Infrastructure development: Port of Ancona	IT	Availability of clean fuels	2025	2027	3	152,4	36%	0,0	0	0,0	
				3.2.07	Infrastructure development: Port of Koper	SI		2022	2040	10	379,0	1%	0,0	0	0,0	
	3,3	Telematics applications (including ITS and ETC), sustainable freight services, innovation (Art. 31, 32, 33) and specific		3.3.01	Telematics applications in the corridor seaports (including VTMS)	PL, IT		2022	2027	6	40,1	50%	0,0	0	0,0	
				3.3.02	Deployment of alternative clean fuel facilities at the corridor seaports	PL, IT, SI	Availability of clean fuels	2023	2033	7	303,2	35%	0,0	3	285,0	
			3.3.03	Cross-corridors and multi-country alternative clean fuel measures	MULTI-COUNTRY	Availability of clean fuels	2022	2026	7	1.914,3	8%	0,0	0	0,0		

GROUP				ACTIONS		MS	IMPACT OF THE ACTION ON KPIS TO ACHIEVE TEN-T REQUIRED STANDARDS	START	END	NUMBER OF PROJECTS	TOTAL BUDGET	% APPROVED FUNDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET	ADDITIONAL PROJECTS REQUIRED TO FULLY REACH STANDARDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET AND OF ADDITIONAL PROJECTS TO REACH KPIS
		3,4	security, safety and accessibility measures (Art. 34, 35, 37)	3.4.01	Cross-corridors and multi-country measures for the development of the maritime infrastructure and operations, including MoS initiatives	PL, SE, PL		2022	2027	2	20,9	2%	0,0	0	0,0
			Cross-corridors and multi-country measures for the development of the maritime infrastructure and operations, including MoS initiatives												
4	Inland waterways	4,1	Development of inland ports and their accessibility	4.1.01	Development of the port of Bratislava	SK	Availability of clean fuels	2023	2023	4	1,6	126%	49,1	0	49,1
			4.1.02	Development of the port of Vienna	AT		2022	2022	1	18,8	53%	0,0	1	10,0	
		4,2	Development of IWW	4.2.01	Cross-corridors and multi-country measures to promote and improve IWW transport	MULTI-COUNTRY		2023	2023	2	35,5	100%	0,0	0	0,0
5	Airports	5,1	Modernization / Expansion of the airport infrastructure	5.1.01	Modernization / expansion of the airport of Gdańsk	PL		2023	2023	2	34,8	71%	0,0	0	0,0
				5.1.02	Modernization / expansion of the airport of Warsaw	PL		2022	2022	1	286,3	0%	0,0	0	0,0
				5.1.03	Modernization / expansion of the airport of Katowice	PL		2023	2040	5	785,4	0%	0,0	0	0,0
				5.1.04	Modernization / expansion of the airport of Kraków	PL		2025	2032	4	384,3	4%	0,0	0	0,0
				5.1.05	Modernization / expansion of the airport of Łódź	PL		0	0	2	2,6	1%	0,0	0	0,0
				5.1.05	Modernization / expansion of the airport of Szczecin	PL		0	0	0	0,0	#DIV/0!	0,0	0	0,0
				5.1.06	Modernization / expansion of the airport of Poznań	PL		2025	2026	3	16,9	4%	0,0	0	0,0
				5.1.07	Modernization / expansion of the airport of Wrocław	PL		2022	2027	6	47,5	7%	0,0	0	0,0
				5.1.08	Modernization / expansion of the airport of Ostrava	CZ		0	0	0	0,0	#DIV/0!	0,0	0	0,0
				5.1.09	Modernization / expansion of the airport of Bratislava	SK		0	0	0	0,0	#DIV/0!	0,0	0	0,0
				5.1.10	Modernization / expansion of the airport of Vienna	AT		2023	2035	2	800,0	0%	0,0	0	0,0
				5.1.11	Modernization / expansion of the airport of Venice	IT		2031	2036	5	558,3	0%	0,0	0	0,0
				5.1.12	Modernization / expansion of the airport of Bologna	IT		2022	2026	17	102,0	0%	0,0	0	0,0
		5.1.13	Modernization / expansion of the airport of Ljubljana	SI		2022	2025	2	51,0	82%	0,0	0	0,0		
				5,2	Telematics applications (including SESAR), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)	5.2.01	Telematics applications (including SESAR) at corridor airports, including multi-corridor and multicountry initiatives	PL, IT		2022	2026	7	371,0	2%	0,0
				5.2.03	Deployment of alternative clean fuel facilities at the corridor airports	PL, IT	Availability of clean fuels	2024	2024	2	5,4	0%	0,0	13	0,0
6	Rail-Road Terminals	6,1	Development of the RRTs and their accessibility	6.1.01	Development of the terminal infrastructure, last mile connections and telematics applications	PL, CZ, AT, IT, SI	Capability of handling intermodal units, 740m train terminal accessibility, Electrified train terminal accessibility	2022	2030	11	388,2	34%	0,0	17	21,9
7	Urban Nodes	7,1	Development of the core network corridor within urban nodes and urban transport infrastructure ensuring interconnections between and within transport modes and	7.1.01	Urban node: Gdańsk	PL		2023	2023	2	92,0	0%	0,0	0	0,0
				7.1.02	Urban node: Warsaw	PL	Axle Load	2022	2030	8	1.065,6	44%	0,0	1	54,9
				7.1.03	Urban node: Katowice	PL	Line Speed, Axle Load, Train Length, Connection to rail, Express road/motorway	2023	2023	2	279,0	85%	0,0	0	0,0
				7.1.04	Urban node: Kraków	PL		2037	2037	1	972,5	0%	0,0	0	0,0
				7.1.04	Urban node: Łódź	PL	ERTMS, Line Speed, Axle Load, Train Length	2022	2029	12	1.564,9	34%	0,0	0	0,0
				7.1.05	Urban node: Szczecin	PL		2023	2028	2	1.362,8	14%	0,0	0	0,0

GROUP				ACTIONS		MS	IMPACT OF THE ACTION ON KPIS TO ACHIEVE TEN-T REQUIRED STANDARDS	START	END	NUMBER OF PROJECTS	TOTAL BUDGET	% APPROVED FUNDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET	ADDITIONAL PROJECTS REQUIRED TO FULLY REACH STANDARDS	COSTS OF OFFICIAL PROJECTS WITH NO BUDGET AND OF ADDITIONAL PROJECTS TO REACH KPIS
			a seamless connection between long distance and regional or local traffic flows	7.1.06	Urban node: Poznań	PL	Line Speed, Axle Load, Train Length	2025	2025	3	818,7	0%	0,0	2	101,7
				7.1.07	Urban node: Wrocław			0	0	0	0,0	#DIV/0!	0,0	1	28,2
				7.1.08	Urban node: Ostrava	CZ	Line Speed, Train Length	2024	2032	3	1.168,6	0%	0,0	0	0,0
				7.1.09	Urban node: Bratislava	SK	Electrification, ERTMS, Line Speed, Train Length	2022	2040	7	2.544,5	34%	0,0	1	34,0
				7.1.10	Urban node: Vienna	AT		2023	2023	3	1.891,7	100%	0,0	1	0,0
				7.1.11	Urban node: Venice	IT	Connection to rail	2023	2027	4	785,0	67%	0,0	0	0,0
				7.1.12	Urban node: Bologna	IT		2026	2028	7	2.632,5	38%	0,0	0	0,0
				7.1.13	Urban node: Ljubljana	SI		2022	2030	10	784,9	26%	0,0	0	0,0
8	Other	8,1	Studies and supporting actions	8.1.01	Cross-corridors and multi-country initiatives for the promotion of intermodal, innovative and interoperable solutions	MULTI-COUNTRY		2022	2023	4	117,4	100%	0,0	0	0,0
									466	86.379,4		2.898,18	56	5.089,8	

Source: tplan analysis based on project list 2021 updated at March 2022; Notes: n.a.: not applicable

Furthermore for each corridor section and node an analysis of the expected impact of the ongoing and planned projects has been performed aimed at identifying gaps with reference to the requirements set in the Regulation (EU) 1315/2013 (gap analysis). For the identified gaps, additional projects not included in the 2021 project list have been identified. The number of additional projects under the scope of each action has been also indicated in the above action plan, which have also been highlighted in orange.

Costs have been estimated for the additional projects identified by means of the above-mentioned gap analysis on the basis of the same methodology adopted for the estimation of the costs of the projects required to reach the standards set in the Regulation (EU) 1315/2013 and included in the project list, but with no official budget. Cost estimates under each action for both official and additional projects have been also included in the action plan and marked orange. For some projects, due to a lack of relevant information, it was not possible to estimate project costs.

Based on the developed estimates, further to the € 86,379 million budget summing up the official costs of the initiatives on the 2022 project list, for which costs are available, at least € 5,089.8 million additional financial resources would be required to implement a) the projects included in the project list impacting on KPIs, but with no official costs provided by the promoters (totalling € 2,898.2 million); and b) the additional projects required to reach the TEN-T standards (amounting to € 2,191.6).

Concerning the project costs estimates developed as part of the 2018-2022 CNC studies, it is noticed that a degree of uncertainty limits the reliability of this exercise. Uncertainties are partially inherent to the adopted approach based on the use of unit costs per km with very limited real knowledge of the characteristics of the sections subject of estimate and/or the strategy/solution to be possibly adopted. Other limits applicable to the estimate of the costs for the projects already included in the list are related to the need to price also the works not required to reach the KPIs, but associated with the solution adopted by the concerned promoter (e.g. project 1070, impacting on the achievement of the 740 meters train length standard, but primarily related to the development of a high-speed rail for passenger transport). Finally, for some projects costs were not possible to be estimated because of a lack of detailed information on certain feasibility aspects, including available spaces, particularly affecting the expansion of terminals and/or infrastructure projects in urban areas, or the availability of alternative clean fuels at airports, which may be achieved also by means of investments in facilities, not necessarily requiring infrastructure projects.

Notwithstanding the limitations associated with the current estimates of the costs for the additional projects, the following considerations are worth to be reported on the implementation difficulties and gap analysis related to the actions that are required to complete the corridor at standard by 2030 (according to a full Regulation 1315/2013 implementation scenario). In this respect, the table overleaf includes the 18 actions for which implementation issues and or gaps towards the completion of the corridor fully at standard by 2030 are present, based on the project list from March 2022.

▪ **Development of rail critical cross-border sections:**

- *Upgrading of the corridor cross-border connection: Opole (PL) – Ostrava (CZ) – Brno (CZ), between Opole and Ostrava.* The project list includes three projects for the modernisation of this cross-border section on the Polish side. The speed standard is not expected to be achieved on the entire sections and gaps are also expected to persist with reference to train length. Three additional projects have thus been identified to fully reach the required standards, with respect to the speed and train length standards on the Polish side. On the Czech side, an additional project has also been identified to achieve the train length standard on the sections between the border with Poland and Ostrava. Costs for these 4 initiatives are estimated at about € 270 million.

Table 10 Actions impacting on KPIs presenting implementation issues and related additional projects

ACTIONS		END DATE OF PROJECTS INCLUDED IN THE OFFICIAL PROJECT LIST, IMPACTING ON KPIs	ESTIMATES OF INVESTMENT COSTS OF PROJECTS IN THE OFFICIAL PROJECT LIST WITH NO BUDGET, IMPACTING ON KPIs	ADDITIONAL PROJECTS REQUIRED TO FULLY REACH STANDARDS	COSTS OF ADDITIONAL PROJECTS REQUIRED TO FULLY REACH STANDARDS	COSTS OF PROJECTS IN THE OFFICIAL PROJECT LIST WITH NO BUDGET AND OF ADDITIONAL PROJECTS TO FULLY REACH STANDARDS	MS AFFECTED BY ADDITIONAL PROJECTS TO FULLY REACH STANDARDS	KPIs AFFECTED BY ADDITIONAL PROJECTS IDENTIFIED TO FULLY REACH STANDARDS
1.1.02	Upgrading of the corridor cross-border connection: Opole (PL) – Ostrava (CZ) – Brno (CZ), between Opole and Ostrava	2023	0,0	4	270,2	270,2	PL, CZ	Train Length, Line Speed
1.1.012	Further upgrading of the cross-border connections Katowice (PL)/Opole (PL) – Ostrava (CZ) – Brno (CZ) in the Czech Republic, including upgrading to HS of the Brno - Přerov (Ostrava) rail line	2031	0,0	1	82,3	82,3	CZ	Train Length
1.1.03	Upgrading of the corridor cross-border connection: Katowice (PL) – Žilina (SK) [Zwardoń (PL) – Skalitz (SK)]	2027	0,0	2	204,9	204,9	PL, SK	Line Speed, Train Length
1.1.04	Further upgrading of the corridor cross-border connection: Brno (CZ) – Wien (Stadlau) (AT)	2032	2.188,2	1	119,7	2.307,9	CZ	Train Length
1.1.05	Upgrading of the corridor cross-border connection: Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)]	2024	0,0	1	35,3	35,3	SK	Train Length
1.1.07	Upgrading of the corridor cross-border connection: Venezia (IT) - Trieste (IT) - Divača (SI) – Ljubljana (SI), between Trieste and Divača	2050	0,0	2	66,2	66,2	SI, IT	Line Speed
1.3.04	Upgrading and modernization of the Corridor lines in Poland	2030	0,0	2	414,0	414,0	PL	Line Speed, Train Length
1.3.09	Upgrading of the corridor lines in the Czech Republic (including the Brno node)	2030	0,0	1	39,4	39,4	CZ	Train Length
1.3.13	Upgrading and modernisation of the Corridor lines in Slovenia	2030	0,0	2	423,9	423,9	SI	Line Speed
3.3.02	Deployment of alternative clean fuel facilities at the corridor seaports	2033	0,0	3	285,0	285,0	IT, SI	Availability of clean fuels
4.1.02	Development of the port of Vienna	2022	0,0	1	10,0	10,0	AT	Availability of clean fuels
5.2.03	Deployment of alternative clean fuel facilities at the corridor airports	2024	0,0	13	0,0	0,0	CZ, PL, SI, IT, AT, SK	Availability of clean fuels
6.1.01	Development of the terminal infrastructure, last mile connections and telematics applications	2030	0,0	17	21,9	21,9	CZ, PL, IT, AT, SK	Electrified train terminal accessibility, 740m train terminal accessibility
7.1.02	Urban node: Warsaw	2030	0,0	1	54,9	54,9	PL	Line Speed
7.1.06	Urban node: Poznań	2025	0,0	2	101,7	101,7	PL	Line Speed
7.1.07	Urban node: Wrocław	0	0,0	1	28,2	28,2	PL	Line Speed, Axle Load, Train Length
7.1.09	Urban node: Bratislava	2040	0,0	1	34,0	34,0	SK	Line Speed
7.1.10	Urban node: Vienna	2023	0,0	1	0,0	0,0	AT	Line Speed

Source: tplan analysis based on project list 2021 updated at March 2022

- *Further upgrading of the cross-border connections Katowice (PL)/Opole (PL) – Ostrava (CZ) – Brno (CZ) in the Czech Republic, including upgrading to HS of the Brno - Přerov (Ostrava) rail line.* Following the extension of the two critical cross-border sections Katowice (PL)/Opole (PL) – Ostrava (CZ) up to Brno, these two cross-border sections also involves all the projects in the Czech Republic for the further improvement of the corridor lines up to Brno and their upgrading to high speed standards for passenger transport. Given that the sections between Ostrava and Brno are common to both cross-border sections, a separate action has been defined, which already includes 12 projects for the modernisation and further upgrading of stations and railway lines on this routing. However these projects may not allow fully achieving the train length standard on the entire extent of the line. Accordingly an additional project has been identified to this purpose for the sections between Ostrava and Přerov. The total cost of this additional project amounts to € 82.3 million.
- *Upgrading of the corridor cross-border connection: Katowice (PL) – Žilina (SK) [Zwardoń (PL) – Skalité (SK)].* Three projects are included in the project list for the modernisation and upgrading of this cross-border section. These initiatives are expected to improve and achieve the speed standard and the train length parameter on several stretches of the cross-border lines. Additional works would however be needed to fully achieve the speed standard on the Polish side and both speed and train length standards on the Slovak side. Investment costs for these works have been estimated at about € 205 million.
- *Upgrading of the corridor cross-border connection: Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)].* Initiatives are already included in the project list for the electrification of this line both on the Austrian and Slovak sides. An additional project has been identified for this section to reach the train length standard on the section Devinska Nova Ves – Bratislava, which is also used for freight traffic. The costs for this additional project have been estimated at € 35.3 million.
- *Upgrading of the corridor cross-border connection: Venezia (IT) - Trieste (IT) - Divača (SI) – Ljubljana (SI), between Trieste and Divača.* The Italian Authorities are considering to submit a request for derogation for the speed standard for freight transport, on the existing line between Bivio Aurisina and the border with Slovenia. On the Slovenian side the achievement of the speed standard for freight transport at 2030 according to the projects included in the list is uncertain and a derogation request for compliance purposes might be issued also by the Slovenian Authorities. Two additional projects have accordingly been identified which may be required to fully achieve the speed standard for freight transport on this critical cross-border section. For the initiative to be implemented on the Slovenian side costs have been estimated at € 66.2 million. Costs for the works required on the Italian side were not possible to be estimated.
- **Modernisation of corridor railway lines outside critical cross-border sections and core urban nodes:**
 - *Further upgrading of the corridor cross-border connection: Brno (CZ) – Wien (Stadlau) (AT).* This cross-border section is already at standard except for the achievement of the train length standard, and it was thus not considered among the critical ones for the development of the BA Corridor. Three projects are already included in the project list for the further upgrading of this line, to achieve high speed standard for passenger transport and the 740 meter train length standard for freight transport. Of these projects one does not include the investment costs, which concerns the upgrading of the Brno - Breclav line as a high speed rail line. Accordingly, the budget of this initiative has been estimated, amounting to about € 2.2 billion. Furthermore the projects included in the list at present may not allow reaching the train length standard on the whole extent of

- the section. An additional project has thus been identified to this purpose, for a total investment cost of about € 120 million.
- *Upgrading and modernization of the Corridor lines in Poland:* the project list includes 13 initiatives for the modernisation and upgrading of the corridor lines in Poland, to improve and achieve the ERTMS, line speed, axle load, train length and intermodal gauge standards. Projects are however still missing for the modernisation of the central branch of the corridor between Tarnowskie Gory and Chorzow Batory and of the western branch of the corridor between Swinoujscie and Szczecin Port Centralny to achieve the speed and train length standards for freight transport. The costs for these additional projects amount to € 414 million.
 - *Upgrading of the corridor lines in the Czech Republic (including the Brno node).* This action includes two initiatives, already encoded in the project list for studies and works related to the modernisation of the Brno railway node, which interconnects three cross-border sections of the BA Corridor: Opole/Katowice-Ostrava-Brno and Brno-Wien. An additional action could be also included in this action to reach the 740 meter train length standard for freight transport on the freight itinerary Prerov-Breclav. The cost of this additional project is estimated at € 39.4 million.
 - *Upgrading and modernisation of the Corridor lines in Slovenia.* Although the project list already includes initiatives for the modernisation and upgrading of the Divača-Ljubljana-Pragersko-Maribor rail line, the achievement of the speed standard for freight transport on all sections is uncertain and a derogation request for compliance purposes might be requested by the Slovenian Authorities. Additional projects to fully reach the speed standards on all sections have thus been identified, for a total cost of about € 424 million.
 - **Modernisation of corridor railway lines at core urban nodes.** Initiatives are already included in the project list for the improvement of the interconnection between the core urban nodes and the links and nodes of the core network, also aimed at achieving line speed, axle load, train length and intermodal gauge standards for freight transport, and ensure rail connectivity to airports for passenger transport. These initiatives are located in the following urban areas: Warsaw, Katowice, Łódź, Poznań, Ostrava, Bratislava and Venice. In the previous paragraphs implementation issues have been mentioned concerning the completion dates of the works for the modernisation of the railway networks in the nodes of Ostrava and Bratislava, also included in several cross-border sections. Further to these implementation issues, the gap analysis performed with reference to the impact of the projects included in the project list on the corridor KPIs shows that in the core urban nodes of Warsaw, Poznań, Bratislava and Wien, the speed standard for freight transport may not be achieved. Furthermore there are no projects on the list for the modernisation of the Wrocław bypass to achieve the speed, axle load and train length standards. Accordingly 6 additional projects have been identified to achieve these standards, for a total cost of about € 219 million, specified that for the achievement of the speed standard on the section Wien Meidling - Wien Inzersdorf investment costs were not possible to be estimated.
 - **ERTMS deployment on the Baltic - Adriatic corridor.** As already commented in previous sections above, there are 14 projects in Austria and one multi-corridor project in Italy that are related to the deployment of ERTMS, for which project costs have not been defined by the concerned project promoters. The implementation costs of these projects have been estimated, totalling about € 660 million. In addition to these projects, the initiative for ETCS deployment in the Brno node has no implementation dates defined as yet.
 - **Modernisation of railway infrastructure at Rail-Road Terminals.** Initiatives have been identified as additional projects that could be possibly implemented to achieve 740 meters train terminal accessibility and/or increase the length of loading/unloading tracks inside terminals up to 740 meters, as well as to provide

electrified train terminal accessibility at terminals. About 16 terminals along the corridor may indeed require one or more of these interventions. Accordingly initiatives have been identified to reach the standards foreseen in the regulation and investment costs have been also estimated for some of these nodes, totalling about € 20 million. Among the identified additional projects for the promotion of multimodal transport, two projects have been proposed by other CNC studies Consortia which relate respectively: a) to upgrading measures for the terminal Wien Freudenau Hafen to achieve 740 meters train terminal accessibility; and b) to upgrading measures for the terminal Bratislava ÚNS to achieve 740 meters train and electrified terminal accessibility. While it might be relevant to consider that these two nodes are primarily used for the transshipment of cargo units between the road and rail transport modes, these are terminals located inside two core IWW ports. As such the KPIs applicable to these nodes are not exactly the ones strictly applying to Rail-Road Terminals.

▪ **Development of critical road cross-border sections:**

- *Brno (CZ) – Wien (AT): Road section Pohořelice (CZ) – Schrick (AT).* As already commented above one road project concerning the completion of the upgrading to two lanes per direction of the road critical cross-border section between Brno and Wien in Austria has its completion date set at 2031. This cross-border section is monitored by the European Coordinator as part of the activities dedicated to the monitoring of the critical cross-border sections.
- **Achievement of the standards required for seaports.** Projects to ensure availability of alternative clean fuels in the ports of Trieste, Ancona and Koper are not included in the project list. Accordingly, dedicated initiatives have been identified in this respect as additional projects. Costs for these initiatives have been estimated at € 285 million.
- **Achievement of the standards required for IWW ports.** Projects to ensure availability of alternative clean fuels in the port of Wien are not included in the project list. Accordingly a dedicated initiative has been identified in this respect as an additional project. Costs for this initiative have been estimated at € 10 million by the Consortium responsible for the analysis of this project. Furthermore, as already mentioned above, the project list includes a project for the construction of an LNG terminal in the port of Bratislava, for which official costs are not provided by the concerned project promoter. Accordingly, the budget of this initiative has been estimated, totalling about € 50 million.
- **Achievement of the standards required for airports.** Projects to ensure availability of alternative clean fuels at all the core airports of the Baltic-Adriatic Corridor, except in Kraków are not included in the project list. Accordingly 13 additional projects have been identified. Costs for these initiatives have not been so far estimated as the strategies to achieve this standard may imply the development and implementation of different solutions, including non-infrastructure measures.

The analysis related to the monitoring of the difficulties and issues affecting the development and completion of the BA Corridor at standard by 2030 shows that there are 18 actions affected by low technical and financial maturity (end dates unknown or set after 2030 and project costs not yet defined) or requiring additional projects to fully achieve the requirements set in the Regulation (EU) 1315/2013. Overall, 56 additional projects have been identified that should be integrated into the project list for a full implementation scenario of the TEN-T Regulation. At the same time the following elements shall be considered for a more appropriate analysis of the current status of the official project list and relevance of the additional projects:

- The additional projects relating to the rail sector mainly concern the speed and 740 meters train length parameters. With reference to speed, Member States and Infrastructure Managers are also considering to apply for derogation, as in many circumstances lack of compliance is limited to short sections and/or sections located in urban areas, or in mountain areas. Urban context and mountain areas represent

indeed a challenge to the technical and economic viability of projects aimed at increasing the speed standard. Yet it would be important to clarify the procedures related to the request for derogation and engage in discussions with the Member States and project promoters to identify the sections possibly subject of these procedures, for a better understanding of the extent and relevance of the problem. Concerning train length, the interpretation so far given to the achievement of the 740 meters train length standard along the CNC over the previous BA Corridor studies since 2014 is that this standard may be achieved by adopting a functional and market oriented approach. In line with this interpretation infrastructure investments may not be required at each station along the corridor to achieve the standard, but improvements may be considered where appropriate, also taking into account requests from the market. It is worth adding in this respect that the Austrian and Slovenian Authorities have already asked the European Commission and the European Coordinator(s) to consider and accept what may be defined an “operational compliance”, according to which long trains are possible to be operated on the corridor lines subject to traffic conditions and permissions. Whilst this approach may create confusion under the analytical point of view and the market (railway undertakings and users of rail freight transport services) may complain about its use, this solution has been already adopted in several work plans and CNC studies. Several RFCs are also using this approach, which may reduce the relevance of additional investments required for infrastructure upgrading purposes (unless it is made more explicit that the “operational compliance” principle is not acceptable). Specifically, concerning the Wrocław bypass, where axle load is also missing in addition to train length and the speed standard, it shall be noticed that an alternative line to the bypass is available for use.

- Whereas electrified train terminal accessibility and 740 meter train length accessibility are relevant to be achieved up to handover stations, the electrification of the tracks and 740 meters long train operations after handover stations and up to inside the terminals may be challenged by several factors, such as land availability and economic viability, and may be only required based on market conditions and perspectives. Accordingly, the interpretation of the Regulation (EU) 1315/2013 over the course of the BA Corridor studies since 2014 about the achievement of the standards at the terminals has not been as strict as for the corridor railway lines, albeit desirable. In line with this, also the additional projects identified for these nodes may not be strictly required for the completion of the corridor at standard by 2030.
- Concerning the other identified additional projects, the ones related to the availability of alternative clean fuels at the corridor ports and airports appear to be crucial, especially in view of the implementation of the TEN-T policy in the framework of the targets of the European Green Deal. The same consideration also applies to road transport, although no methodology has been adopted yet to measure compliance in this regard.
- Low technical and financial maturity of projects, particularly of those initiatives impacting on the achievement of the KPIs remains a key implementation issue, as relevant as, or may be even more relevant than the need for additional projects for the BA Corridor. It is thus important to continue monitoring the implementation of the projects along the corridor by means of the analysis performed as part of the elaboration of Project Implementation Reports, and organisation of dialogues with the stakeholders, to track progresses of studies and works, as well as identify implementation problems and issues at their early stage of occurrence, with specific reference to the actions directly associated with the work plan priorities.

5.5 Analysis of delayed projects

In addition to the analysis presented in the previous sections about the project technical and financial maturity and gap analysis, an analysis of the completion dates of the projects included in the 2021 project list updated at March 2022 have been also performed, comparing these dates with the ones included in the 2019 project list of March 2019. This scrutiny was aimed at identifying delays in the development and implementation of projects, focussing on those required to reach the TEN-T standards, thus impacting on at least one KPI.

The results of this analysis are presented in the table overleaf, with reference to the actions included in the action plan for the development of the BA Corridor by 2030. The table includes the actions that include at least one project whose completion date has been delayed by at least two years. Further to the number and completion date of the action, the number of delayed projects, the impacted KPIs, the budget and project promoter are specified.

The findings from the completion dates comparison analysis of the projects included in the PIR 1/2022 vs the PIR 1/2022 project lists together with the outcomes of the analysis of the technical and financial maturity of the projects and of the gap analysis illustrated in the previous paragraphs, seem suggesting the opportunity to visit the BA Corridor railway infrastructure managers to discuss about the preparation, development and implementation of the projects both relating to cross-border sections and national railway lines. Visits may be performed in the following order of relevance:

- PKP Polskie Linie Kolejowe S.A./Polish Railway Infrastructure Manager;
- Ministrstvo za infrastrukturo/Ministry of Infrastructure of Slovenia, DRI upravljanje investicij, d.o.o./DRI Investment Management L.t.d. (Consultancy Body of the Ministry), Slovenske železnice – Infrastruktura, d.o.o./Railway Infrastructure Manager, Javna agencija za železniški promet Republike Slovenije/Public Agency of the Republic of Slovenia for Railway Transport;
- ÖBB Österreichische Bundesbahn/Austrian Railway Infrastructure Manager;
- Železnice Slovenskej republiky/ Slovak Rail Infrastructure Manager;
- Správa železniční dopravní cesty, s.o./Czech Railway Infrastructure Manager;
- Rete Ferroviaria Italiana/Italian Railway Infrastructure Manager.

Whilst visits may be performed individually to each infrastructure manager during the transition period up to the entry into force of the new TEN-T Regulation, in view of organizing cross-border dialogues as soon as the new legislative framework will be in place. The analysis is indeed also showing the relevance of organizing dialogues on the progresses of both rail and road critical cross-border sections.

Table 11 Actions including projects impacting on KPIs whose completion has been delayed by two years or more

ACTIONS		End date of projects included in the official project list, impacting on KPIs	No of projects delayed by two years or more impacting on at least one KPI	Involved KPIs	Responsible Promoter	Budget of those projects
1.1.01	Upgrading of the corridor cross-border connection: Katowice (PL) – Ostrava (CZ) – Brno (CZ), between Katowice and Ostrava	2026	1.0	Line Speed, Axle Load, Train Length	PKP Polskie Linie Kolejowe S.A.	760.3
1.1.012	Further upgrading of the cross-border connections Katowice (PL)/Opole (PL) – Ostrava (CZ) – Brno (CZ) in the Czech Republic, including upgrading to HS of the Brno - Přerov (Ostrava) rail line	2031	1.0	Train length	Railway Infrastructure Administration, state organization (Správa železnic)	1,985.3
1.1.05	Upgrading of the corridor cross-border connection: Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)]	2024	1.0	Electrification	Železnice Slovenskej republiky (ŽSR)	14.0
1.1.07	Upgrading of the corridor cross-border connection: Venezia (IT) - Trieste (IT) - Divača (SI) – Ljubljana (SI), between Trieste and Divača	2050	1.0	Line speed	Ministry of Infrastructure of Slovenia	53.0
1.2.01	Alpine Rail Crossings (Semmering Base Tunnel, Koralm railway line and tunnel)	2028	1.0	Electrification, ERTMS, Line Speed, Axle Load, Train Length	ÖBB-Infrastruktur AG	3,365.2
1.3.04	Upgrading and modernization of the Corridor lines in Poland	2030	3.0	Line Speed, Train Length	PKP Polskie Linie Kolejowe S.A.	1,168.3
1.3.13	Upgrading and modernisation of the Corridor lines in Slovenia	2030	2.0	Line Speed, Axle Load (Pragersko Railway Station)	Ministry of Infrastructure of Slovenia	258.1
1.4.01	ERTMS deployment on the Baltic - Adriatic corridor	2031	6.0	ERTMS	ÖBB-Infrastruktur AG, RFI S.p.A.	125.8
2.1.01	Road section Katowice (PL) – Žilina (SK)	2030	3.0	Expressway/motorway	National motorway company (NDS)	785.2
2.1.02	Brno (CZ) – Wien (AT): Road section Pohořelice (CZ) – Schrick (AT)	2031	2.0	Expressway/motorway	Road and Motorway Directorate (RSD), ASFINAG (Austrian Road Infrastructure Manager)	462.9
2.2.03	Completion of the Corridor road network in Poland	2030	1.0	Expressway/	GDDKiA (national road	629.2

ACTIONS		End date of projects included in the official project list, impacting on KPIs	No of projects delayed by two years or more impacting on at least one KPI	Involved KPIs	Responsible Promoter	Budget of those projects
	(S3, A4, A1 and S7)			motorway	infrastructure manager in Poland)	
2.2.05	Completion of the Corridor road network in the Czech republic (D1)	2032	1.0	Expressway/ motorway	Road and Motorway Directorate (RSD)	290.9
3.1.04	Development of interconnections: Port of Trieste	2026	1.0	-	RFI S.p.A.	112.0
3.3.02	Deployment of alternative clean fuel facilities at the corridor seaports	2033	1.0	Alternative clean fuels	Venice LNG	0.0
4.1.01	Development of the port of Bratislava	2023	1.0	Alternative clean fuels	Verejné prístavy, a.s. (Public ports, jsc)	0.0
7.1.02	Urban node: Warsaw	2030	1.0	Axle Load	PKP Polskie Linie Kolejowe S.A.	467.5
7.1.04	Urban node: Łódź	2029	1.0	ERTMS	PKP Polskie Linie Kolejowe S.A.	322.8
7.1.08	Urban node: Ostrava	2032	1.0	Line Speed, Train Length	Railway Infrastructure Administration, state organization (Správa železnic)	989.0

Source: *tplan analysis based on project list 2021 updated at March 2022*