BENEFIT

Business Models for Enhancing Funding & Enabling Financing for Infrastructure in Transport

Deliverable: D 4.1 – Lessons Learned Stage 1

European Commission

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Deliverable: D 4.1 – Lessons Learned Stage 1

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The Partnership

University of the Aegean,
Department of Shipping, Trade and Transport

Project Coordinator

TPR
Department of Transport and Regional Economics
University of Antwerp

PA&M
Public Administration & Management
University of Antwerp

UNIVERSITY of OULU
OULUN YLIOPISTO

Cerema

KIT
Karlsruhe Institute of Technology

TRT

UNIVERSITY OF TWENTE.

Road and Bridge Research Institute

TÉCNICO LISBOA

TIS
TRANSPORTES, INOVAÇÃO E SISTEMAS

Bartlett School of Construction & Project Management UCL

omega centre
Centre for Mega Projects in Transport and Development
UCL

uclan

Faculty of Civil Engineering University of Belgrade 1846

UNIVERSIDAD DE LAS PALMAS DE GRAN CANARIA

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Document summary information

Initials	Contributing Authors	Organisation	Key Contributions (Chapters/Sections)
MB	Silvia Maffii	TRT	Coordination of work. Chapters from 1 to 7 and 9.1. Appendixes from A.1 to A.9.
SM	Marco Brambilla	TRT	
RP	Riccardo Parolin	TRT	
FT	Fabio Torta	TRT	
JB	João Bernardino	TIS	Chapter 8 and 9.2
DC	Daniela Carvalho	TIS	

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Quality Control

	Who	**Date**
Checked by External reviewer	Prof. Werner Rothengatter	30/11/2015
Checked by External reviewer	Prof. Werner Rothengatter	18/11/2015
Checked by Internal reviewer	Prof. Rosário Macário	21/09/2015, 26/11/2015
Checked by Internal reviewer	Prof. Athena Roumboutsos	28/06/2015, 15/09/2015, 26/11/2015
Checked by Internal reviewer	Prof. Kay Mitusch	26/11/2015
Checked by Internal reviewer	Prof. Thierry Vanelslander	24/07/2015
Checked by Internal reviewer	Prof. Aris Pantelias	24/07/2015
Checked by Task Leader	Dr. Silvia Maffii	22/01/2016
Checked by WP Leader	Dr. Silvia Maffii	22/01/2016
Checked by Project Coordinator	Prof. Athena Roumboutsos	

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Glossary

Within BENEFIT certain terms are used throughout. These are described here.

Collective BENEFIT database: This is the BENEFIT database consisting, at the start of the project, of seventy-five case studies of funding transport infrastructure and twenty-four country profiles. These are published data from COST Action TU1001 and the OMEGA Centre megaprojects. During the course of the project, the database will be supplemented with at least twenty-eight more cases of funding/financing infrastructure (in particular public funding/financing, which are less represented).

Funding Scheme: A funding scheme is considered to be any combination of private and public income generated by or towards the infrastructure over its life cycle. These may include any combination of user contribution (tolls, fees, fares etc.) or public contributions based on direct and indirect taxation etc. Public funding may also take on the form of availability fees, shadow tolls etc.

Financing Scheme: A Financing scheme is considered to be any combination of public and/or private financial investments required by the infrastructure over its life cycle.

Business model: The business model describes the business case of the overall investment in the project. Depending on the context, it may be narrowed, including strictly the infrastructure projects considered, or it may be widened, including other planned and commonly designed activities in order to capture other "planning gains" (and other value-added services) and even exploiting synergies across the sectors (e.g. transport, energy, ICT). The latter incorporates the notion of innovative procurement and other approaches to infrastructure delivery, now in the pilot phase.

Key Elements: Elements are groups of variable project dimensions of the same context, which influence the performance of the funding scheme and financing scheme. Elements, as noted in Figure 1.1.1 [of the proposal/contract], are the implementation environment (socio-political, micro and macroeconomic, institutional, regulatory, etc.); the transport mode (functionality; natural and contractual exclusivity, etc.); business model structure; funding scheme; financing scheme and governance and institutional arrangement (risk allocation; decision making processes; ownership rights, etc.).

Typology: A typology concerns groups of factors describing a project that contribute in demonstrating a particular behaviour. Example: Negative Private investment environment type in the implementation context typology. The group of factors leading to the demonstration of this behaviour may be: poor growth forecast, lack of enabling legal framework etc. Typologies for every element (context) will be generated during the project using the collective BENEFIT database (country profiles and case studies) as field examples and desk research. Quantitative and qualitative analysis are the analytical tools that may be used.

Decision Matching Framework: This is the Analysis and Decision Framework to be developed by the BENEFIT project. The framework will contain typologies influencing the overall performance of the investment. It will initially be developed using hypotheses of optimum matching between types, which are confirmed as Matching Principles (rules describing how optimum performance may be achieved) during the course of the project. As such, it could be used as an analysis tool (e.g. identification of "mismatches") or decision tool (e.g. given the types of elements, which funding scheme type or project rating framework (expressed as the risk to match a specific financing scheme) or project rating enhancing framework (which types may be changed and in which direction to improve project rating) is most appropriate).

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Executive Summary

According to the EU aim of Topic MG 9.3 “Analysis of funding schemes for transport infrastructure”, this Deliverable has been conceived in view of formulating a structured, integrated, comprehensive and extensive information for policy makers and providers of financing and funding, which facilitates design and implementation and rises awareness.

The starting point of the work is the collective database of case studies and knowledge base of almost twenty years of EC and national funded research on funding and financing schemes for transport infrastructures, pricing of transport infrastructure investment assessment and transport policy, as well as the results of the COST Action TU1001.

According to the overall objectives of providing structured, integrated and comprehensive analysis with findings that may be transferable and objective, this work aims to provide a policy tool, guidelines and recommendations on financing and funding the design, implementation and maintenance of investments in transport.

In this process the Decision Matching Framework guides the work implemented in form of two steps, namely an ex-post analysis and an ex-ante assessment.

The ex-post assessment consists of the analysis of the actual experience. Lessons learned are drawn on “mismatches” of funding and financing schemes, identifying the underline sources; typological settings are related through a set of rational hypotheses of causal effects based on risk profiles and risk appetites. The ex-ante assessment works on the potential of transport investments and the related funding schemes; the hypotheses of the Decision Matching Framework are conclusively tested and maybe used as “matching principles”.

The Deliverable D4.1 has been developed within frame of the ex-post analysis and assessment of the actual experience. As part of the activities of Work Package 4 – Stage 1, it concerns the comprehensive analysis of financing schemes based in different parts of Europe and in different transport modes. In this Deliverable D4.1, the BENEFIT case studies have been scrutinised under the perspective of the lessons learned, analysing mismatches and identifying underlining sources, like: implementation context, transport mode, governance, procurement and contracting arrangements, business models and performance with respect to the actual outcomes. A mix of analyses constitute the baseline from which findings may be transferred.

The ex-post analysis and assessment of the actual experience draws upon the extensive BENEFIT database updated starting from COST Action TU1001 and OMEGA case studies. The database has been assembled making the best use of the information from both previous projects and identifying additional cases. Data has been updated through two protocols specifically tailored on both financing schemes. Additionally, directs interviews have been carried out with stakeholders to finalise. The database assembled includes 81 cases studies, of which 53 PPPs and 28 public projects.

Firstly, to draw lessons learned, the outcomes of the case studies have been compared with their initial objectives in order to identify influencing variables. The methodology has been conceived in form of a stepwise approach, of which the third and final is the core of the Descriptive Statistics analysis.

The Descriptive Statistics analysis stems from the review of the literature on lessons learned on PPPs and, to some extent, also on public projects. The review of the literature discusses the most relevant topics worth being considered and provides guidance to identify the variables to be used during the elaboration of the analysis. Across the dimensions considered, recurring variables have been identified with respect to the

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deviations of investment cost, transport demand and time schedule of completion of work, namely the actual outcomes achieved compared to the initial assumptions. Therefore, the Descriptive Statistics analysis helped to identify what variables may play in determining such deviations and that be put in relation to the performance.

The database assembled is the best and largest available, but it contains those projects for which details were available. Therefore, it cannot be considered a fully random sample in statistical terms and not representative of the universe of transport infrastructure projects delivered. From this perspective, the results of the Descriptive Statistics analysis are indicative and should be generalised with caution.

From this analysis lessons have been drawn on the relevance of the following aspects.

- A low level of complexity and well-delineated boundaries of implementation (i.e., spatial and technical) are advantages compared to more complex situations. Relatively smaller projects, instead of a totally new ones, could be more beneficial in order to meet initial costs and demand forecasts. The risk of deviations implementing for example non-standard technologies could be reduced. Besides, availability of historical data on construction and traffic could be another advantage. The case studies seem not confirming the hypothesis that small projects are less likely to exceed costs forecasts, compared to those larger. Concerning the financing schemes, PPPs perform more in line and public cases more exceeding outcome forecasts. This suggests that PPPs are less likely to underestimate costs and delivery time and public projects are more incline to underestimate transport demand.

- The analysis on the physical description suggests that cases within nodes and links are less susceptible to cost overruns and delays and more consistent with demand forecasts. Projects like bridges and tunnels, technically more difficult that other infrastructures might be designed with more attention to avoid cost and time overruns. In this dimension, there is not a significant difference amongst financing schemes.

- The specialisation in terms of transport demand served. Projects conceived for a user-specific purpose are more likely to perform according to forecasts, compared to those designed for a mix use. Amongst modes, although based on a very limited number of observations, dedicated freight projects generally perform better. In freight specific projects, operations can be more easily kept separated from other functional and complementary assets that need large investment.

- The type of repayment revenues foreseen during the operating phase emerged as an incentive to avoid deviations from forecasts, notably concerning the implementation schedule, which may trigger “debt traps”. Projects that recover costs through user charges generally perform better, especially if PPPs.

- The appropriateness of the allocation of construction and commercial/revenue risks. With respect to the construction risk, the contractor performs better than the public party. On commercial/revenue side, the public party performs better, especially implementing PPPs. According to the review of the literature, this result might be explained possibly because of higher charges levied by the contractor to the users, to achieve cost-coverage.

Secondly, funding sources and issues have been investigated. This analysis should not be read strictly in relationship with the previous, but rather linked with the previous and future work in BENEFIT.

The approach developed gives an overview on the quantitative structure of funding schemes and a qualitative discussion on their effects on the outcomes of the case studies, like for instance revenue risk, or incentives.

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The review of the qualitative identification of funding scheme related issues, which were identified in Deliverable 2.2, has found several examples of manifestation of these issues, as relevant aspects for a project's economic and political feasibility and for its overall performance.

The validation through examples was strongest on the issues of risk of revenues, allocative efficiency and acceptability. It was weaker in the scope of the revenue incentives issue. On the specific issue of the application of value capture approaches, while this has not been a specific aim of the cases, the contents of a few cases allowed to identify some potential for the application of value capturing to agents which indirectly benefit from the project. Additionally, the review allowed to identify a close linkage between revenue risk and the acceptability and allocative efficiency issues. For example:

- A lack of acceptability for the user charging scheme may reduce demand and even exacerbate the use of alternative (free to use) infrastructure; these two aspects will in turn into reduced revenues, as people refrain from using the infrastructure and give preference to alternatives (not necessarily rationally but instead to reflect their lack of acceptability of tolls or user charges).

- The use of brownfield infrastructure charges to finance greenfield infrastructure appears to bear additional acceptability risks and accordingly revenue risks.

- The "optimism bias" together with the ability to increase user charges often leads to increases in prices; this both aggravate eventual opposition to the project and generate acceptability problems and further reducing demand, eventually leading to increased revenue risks.

Another aspect worth noting is the role of the economic crisis in affecting the acceptability and revenue risk profile of projects. In many cases it was observed that the economic crisis led to either lower demand (due to reduced economic activity) and/or increased user charges (due to State's inability to cover the infrastructure costs). This has generated, in-turn, acceptability problems and led to the renegotiation of contracts. The detailed analysis of the specific impacts of the economic crisis will be performed in Task 4.3.

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1. Introduction to the BENEFIT Project

BENEFIT takes an innovative approach by analysing funding schemes within an inter-related system. Funding schemes are successful (or not) depending on the Business Model that generates them. The performance of the Business Model is affected by the implementation and the transport mode context. It is matched successfully (or not) by a financing scheme. Relations between actors are described by a governance model (contracting arrangements). These are key elements in Transport Infrastructure Provision, Operation and Maintenance, as illustrated in Figure 1.1.

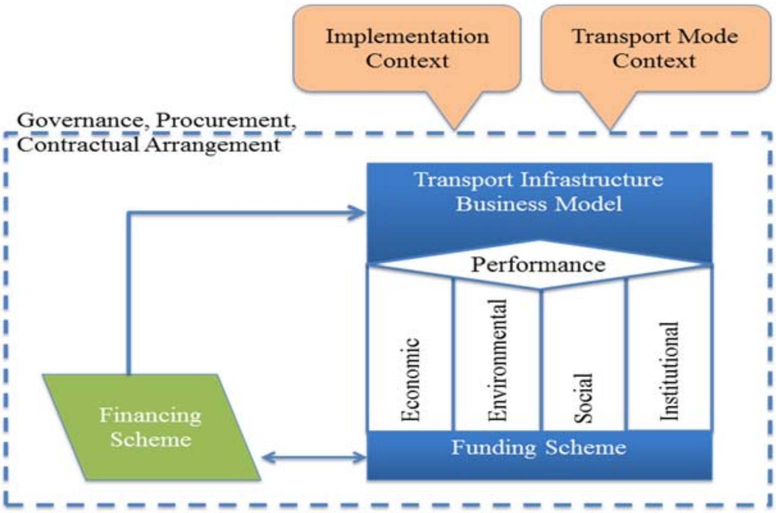

Figure 1.1: BENEFIT Key Elements in Transport Infrastructure Provision, Operation and Maintenance

Success is a measure of the appropriate matching of elements. Within BENEFIT funding and financing schemes are analysed in this respect. Describing these key elements through their characteristics and attributes and clustering each of them into typologies is the basis of, first, developing a generic framework. Identifying best matches in their inter-relations (matching principles) leads to move from a generic framework to a powerful decision making one (Decision Matching Framework) that is developed to guide policy makers and providers of funding (and financing) extensive comparative information on the advantages and limitations of different funding schemes for transport infrastructure projects and improve the awareness of policy makers on the needs of projects serving an efficient and performing transport network within the horizon 2050. Besides, the framework allows policy makers to identify changes that may be undertaken in order to improve the potential of success, such as improving the value proposition of the business model.

In developing this framework, BENEFIT takes stock of case studies known to its partners in combination with a meta-analysis of relevant EC funded research and other studies carried out with respect to funding schemes for transport (and other) infrastructure and direct contact with key stakeholder groups.

More specifically, BENEFIT uses the published case study descriptions of seventy-five transport infrastructure projects funded and financed by public and private resources from nineteen European and four non–European Countries covering all modes of transport. It also exploits twenty-four European country profiles with respect to contextual issues (institutions, regulations, macroeconomic and other settings) influencing funding and financing of transport infrastructure. This data has been produced within the framework of activities undertaken by the OMEGA Centre for Mega Projects in Transport and Development and the COST Action

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TU1001 on Public Private Partnerships in Transport: Trends and Theory. In addition, BENEFIT, through its partnership and respective experts, consolidates almost twenty years of successful European Commission research with respect to issues related to transport infrastructure and planning, assessment and pricing of transport services. Therefore, its approach is supported by the tacit knowledge and insights of the BENEFIT partnership with respect to infrastructure projects in transport.

By applying the Decision Matching Framework, BENEFIT will undertake:

- An ex-post analysis and assessment of alternative funding schemes (public, PPP and other) based on existing experiences in different transport sectors and geographical areas and their assessment with respect to economic development, value for public money, user benefits, life-cycle investment, efficiency, governance and procurement modalities, etc.; and, provide lessons learned, identification of the limitations of the various schemes and the impact of the economic and financial crisis[1].
- An ex-ante (forward) analysis and assessment of the potential of transport investments and the related funding schemes, including innovative procurement schemes still in a pilot phase, to contribute to economic recovery, growth and employment, in view of future infrastructure needs with a 2050 horizon for modern infrastructure, smart pricing and funding.

BENEFIT is concluded within twenty one months and bears the following innovative aspects:

- Transport infrastructure business models and their project rating: improved value propositions lead to funding schemes with enhanced creditworthiness enabling viable financing, balancing of project financing and funding risks, increasing the value basis of stakeholders and highlighting the potential of transport investments.
- Transferability of findings with respect to lessons learned, limitations and the impact of the economic and financial crisis through the introduction of typologies.
- Open-access case study database in a wiki format, allowing for continuous updates and providing a knowledge base serving both practitioners and researchers.

[1] Throughout the text, *Italics* are used when including *words* extracted from MG 9.3 – 2014 “Analysis of funding schemes for transport infrastructure”.

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2. The objectives of WP 4

2.1 Description of work

WP4 concerns the comprehensive analysis of funding schemes based on actual experience in different parts of Europe and in different transport modes. WP4 is articulated in three subtasks:

1. Task 4.1 regards “Lessons learned” and is articulated in two stages. Stage 1 studies a database of case studies through a desk analysis. Stage 2 completes the work of Task 3.1 on Matching Principles, pulling together the typologies identified in WP2 and creating a set of hypotheses to guide the matching of the basic elements of WP2;
2. Task 4.2 focuses on “Limitations and Tolerance to Change”. It aims to identify limitations of funding and financing regimes and mitigate their effects and provide with best practices;
3. Task 4.3 concludes on the “Effects of the recent Economic & Financial Crisis” taking stock of the analyses on lessons learned and limitations, emphasising on the types and typological settings mostly influenced by the crisis. This work includes a comparative analysis of resilience and robustness of different business models and respective funding schemes, and in the context of specific transport modes.

These subtasks are carried out sequentially with slight overlap, so as to transfer input from one task to the next.

The analysis is based on the respective methodological framework devised in WP3. Through an ex-post analysis of existing experience the matching principles (hypotheses) are applied and tested. Feedback from this process is used to finalise the Decision Matching Framework in its function as a policy guiding tool. Eventually, conclusions are delivered in terms of typological settings so as to allow for the transferability of findings.

The study analysis is based on the collective BENEFIT database developed in Task 2.1 and refined in Stage 1 of WP4 through semi-structured interviews and additional data collection (i.e., online search and project reports). The analysis is empirical and structured using the Matching Framework developed in Task 3.1. With respect to testing of hypotheses the BENEFIT database allows for the use of semi-quantitative methods in the middle between a qualitative and quantitative approach and offers a systematic approach that at the same time can examine extensive numbers of different combinations but does not disaggregate the case as a variable-based approach would.

2.2 Task 4.1 Lessons learned: Stage 1

The purpose of the first stage within Task 4.1 is to perform a scrutiny of the case studies made available in BENEFIT database[2], under the perspective of the lessons learned, with respect to the impacts generated on both financing schemes applied and revenue stream models (funding schemes). This activity has been carried out by deploying two sources:

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[2] See Appendix A.7.

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- A detailed desk analysis (Descriptive Statistics) of BENEFIT database, focusing on the key elements, in line with the analyses carried out in WP2. This activity has been done making the best use of the information from COST Action TU1001 and OMEGA projects and having identified additional cases. Data has been updated and obtained through two protocols tailored for private co-financed and public financed transport infrastructures (see Deliverable D2.1). The structure of the protocols and the sections organised for the purpose of the analysis are presented in Chapter 3.

- Direct interviews (mostly managed electronically and through phone calls, leaving direct interviews as an exception) have been carried with stakeholders (public concession authorities, concessionaires and financers). Topics worth being considered have been also classified depending on the relevance of the practices emerged in successful transport infrastructure investments (especially PPP projects), namely: procedures, financial interest rates, credit availability, technical and environmental issues, cost overruns, delays occurred, etc.

The Descriptive Statistics analysis of the BENEFIT database (Chapter 7) has been carried out jointly with main findings obtained from a review of the literature (Chapter 4). This has been used as a starting point to identify best practices and successful cases and to highlight the reasons why a project should be regarded as good/bad practice. In this view, one could anticipate that relevant variables could be for example: transport demand below forecasts, the size of the investment (considering the life-cycle of the structures), the value for money under the public perspective, unforeseen changes of the context (e.g., change in taxes, input prices, modification of laws, political interference), etc.

In parallel with the Descriptive Statistics analysis a specific aspect has been investigated to draw further conclusions under a different perspectives and in view of the next stages of the BENEFIT project. It consists of an overview throughout the case studies of the application of the income streams and related issues.

2.3 Report Structure[3]

This report concerns the analysis of the actual case studies made available in the collective BENEFIT database.

The content of the deliverable is organized to provide with the main findings obtained. To achieve this goal, Chapter 3 introduces to the structure of the protocols used to gather data on the cases and presents the variables with respect to which the information has been collected.

The starting point of the quantitative analysis is the literature review presented in Chapter 4. Such review discusses the most relevant topics worth to be considered and provides guidance to identify the variables to be used during the elaboration of the analysis and in view of providing lessons learned.

Chapter 5 presents the methodology conceived to perform the desk analysis of the case studies. The methodology has been structured in form of a sequence of three levels. The first level consists of an assembling phase in which an appropriate shape is given to the database using suitable classification variables. The second level introduces the outcome variables and further elaborations for the purpose of the analysis in the next two levels. Level three analyses the influence of the classification variables on the outcomes of case studiesand considers these effects separately. Eventually, in a fourth level, the influence of the classification variables on the outcomes of the cases has been investigated simultaneously. Since

3 Chapters 1, 2 3, 4, 5, 6 and 7 have been developed by TRT Trasporti e Territorio, with contributions from all the partners to build the database of the case studies. Chapter 8 has been developed by Consultores em Transportes, Inovação e Sistemas, s.a. (TIS).

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such further level of analysis did not allow to clearly derive lessons learned, the additional work is not documented the main text, but in Appendix A.5.

Chapter 6 gives an overview of the content of the database assembled, provides relevant summary statistics of the case studies and discusses the appropriateness of quality and quantity of the information gathered. This section anticipates also on the manipulations done on the variables used to carry out the analysis (explanatory details are shown in Table A.2 of the Appendix).

Chapter 7 concerns the Descriptive Statistics analysis of the BENEFIT cases. It is structured in three parts, in which paragraph 7.2 discusses only the cross-tabulations for which substantial findings can be presented and paragraph 7.3 summarises the conclusions and lessons learned.

Chapter 8 focusses on the application of income streams and issues affecting funding schemes that were identified in Deliverable 2.2, namely: revenue risk, incentives, allocative efficiency and acceptability/equity. The purpose of this analysis is to give an overview on the quantitative structure on funding schemes (8.1) and a qualitative discussion on their effects on the outcomes, like for example revenue risks, or incentives (8.2). In addition to these, the qualitative analysis also provides insights for discussing the issue of value capturing and its potential contribution to cost recovery. This analysis should not be read strictly in relationship with the Descriptive Statistics one, but rather linked with the previous and future work in BENEFIT.

Other data, tables and descriptions used are gathered in the appendices from A.2 to A.7.

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3. Preparatory steps

According to the purpose of Task 4.1, two protocols have been designed to collect data on the case studies[4]. The protocols have been organised to include information to scrutinise the case studies under the perspective of the lessons learned, with respect to the impacts generated on both financing schemes applied and revenue stream models (funding schemes). As several case studies were already available from COST and OMEGA projects, in the definition of the data needed for Task 4.1 an effort has been made to make the best use of the information already existing. This allowed minimizing the need for the search of new data.

This initial combination of projects has been enriched with additional cases for which data and relevant information could be accessed. Since the sample contains those projects for which details were available, it cannot be considered a fully random sample in statistical terms, therefore it is also not representative of the universe of transport infrastructure projects delivered. From this perspective, the results of the analysis are indicative and should be generalised with caution.

The content of the two protocols is largely shared across financing schemes. They have been tailored to incorporate differences where necessary. The protocols are structured in sections. Each section addresses a specific topic as listed below.

- WHAT provides a general introduction of the case study in terms of physical characteristics (e.g. node, link within a network), the level of exclusivity (monopoly status, natural and contractual), level of functional integration with other networks and the weight of other transport modes with respect to the principal one;

- WHO describes the contracting authority, the level from which the project was driven, the level of Government involvement, the maturity of PPP's policy, programme, political support, commitment, evaluation, legislation and contract used in the country;

- WITH WHO/WHAT presents project sponsors, the entity responsible for the implementation of the project (SPV), subcontracting, financing structure, capital structure, supporting aspects and instruments and a description of the private sector (in case of a PPP project);

- WHO FOR describes project's users (passengers, freight and mix uses);

- WHY presents the reason for selecting the delivery method/financing scheme in terms of being part of TEN-T and finance and service needs (in case of a PPP project);

- WHEN refers to timing of the project, as regards the economic context and with respect to per capita GDP, per capita income and unemployment rate in the region wherein the case study has been implemented;

- WHERE describes the locality at different scales, spanning from urban to cross-border and international, and the market geography providing about the population density and level of industrialisation (including the possibility of specific production activities);

- WHICHWAY is the most articulated section of the protocols and needed adaptations amongst financing schemes to take into account of differences on: procurement, tendering, contracting,

[4] Make reference to Deliverable D2.1 for more details.

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income sources (funding agent and indexation), claims and re-negotiations (number, reason, duration and impact on costs). The rest of the information refers to the revenue stream during the operating phase, risks (allocation, assessment and mitigation), performance (with respect to selected indicators, costs and revenues). Depending on the complexity of the project, the protocols allow to introduce information according to the actual number of contracts.

- Project Outcomes identify the factors that have contributed in making a project a successful case, or a failure. The protocols of PPP cases include additional questions on: cost recovery, incentives, conflicting pricing objectives and acceptability.

- Assessment with respect to transportation goals can be described in terms of: reduction of travel time, reduction of travel costs, relieving of congestion, improvement of reliability and improvement of safety;

- The final section on other details gives the possibility to complete the description of the case study including narrative information on three important categories of impact that a project can generate, namely: economic, social and environmental.

The protocols have been used to gather information on the case studies made available on a dedicated section of BENEFIT's website. To facilitate the procedure to input the data, several questions have been organised in form of multiple choice, allowing the possibility to enclose additional explanations in the form of free text. Such structure has been organised also in view of possible manipulations needed to carry out the analysis foreseen.

The structure of the protocols is therefore complex and includes a number of elements. Not all these elements are equally relevant for the application of the methodology that will be presented in Chapter 5. The analysis of the protocols has been therefore concentrated on the sections reporting the more relevant information. The relevance of the information has been defined also building on the review of literature presented in Chapter 4.

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4. Literature review

The purpose of this chapter is to present a review of the literature on lessons learned on PPPs and, to some extent, also on public projects. The review of the literature has been carried out in view of providing support on the analysis of the case studies that is performed following the methodology presented in Chapter 5. Matching with the results of the Descriptive Statistics analysis, the literature review allows identifying some findings that are in accordance with previous empirical researches and reports on other achievements worth being presented and discussed. Previous research also provides initial guidance as to the selection of key variables to be used.

The review of the literature considered relevant empirical findings from projects implementation and from a number of sources including: reports published by international financing institutions and donors (i.e., the World Bank and the European Investment Bank), works of national authorities and researches published in academic journal articles, books and deliverables. Table A.1 in the Appendix shows the documents examined and their contribution to lessons learned.

The review of the literature has been focused on the most notable characteristics reported in the protocols designed to collect information. More specifically:

- With respect to the general description of the case studies (section WHAT), the review concentrated on the findings of previous research achieved regarding transport modes, projects' physical characteristics (i.e., link and node) and size of the investment.
- The timing of the project (section WHEN) has been analysed looking for the effects of the macro-economic context on projects' implementation and performance. Deviations from the expected trends of the economy in the region where a project is developed may have a strong influence on the actual outcomes (e.g., transport demand and revenues generated).
- A project delivery structure is certainly a dimension of interest (section WHICHWAY) and this is well demonstrated in the literature. In turn, the delivery structure involves several fields of research, embracing: procurement and tendering procedures (i.e., construction and maintenance contracts), level of competition in the tendering process, allocation of risks between private and public parties, funding schemes in term of combination of income sources (i.e., users, public funds, mixed, etc.) and project performance with respect to costs, revenues and time to completion.

The main outcomes of the review of the literature are presented in the two following sections. The first section presents the main lessons learned in general terms and emphasises recurrent findings, like the importance of accurate estimates and causes of errors in estimations. The second section details the findings by project influencing characteristics.

4.1 Lessons learned – Recurring issues

In general for both PPP and publicly financed projects the starting point of the analysis is - and therefore the lessons learned are - derived from the **actual outcomes achieved**. In this view, it can be assumed that a project is successful if it has been completed according to the forecast time schedule at the forecast costs

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and that it delivers the expected services, at the expected quality and for the expected users (i.e., transport demand)[5].

Furthermore, since public financing is always involved, either partially or in total, another relevant question regarding the success of a project is whether the use of public funds could be justified, looking at the expected outcomes. In other words, projects should first fulfil government objectives and demonstrate sufficient Value for Money (VfM) for implementation.

The main lessons learned from literature review regarding the outcomes of the projects refer to the following aspects:

- Need of appropriate feasibility study and especially demand forecasts;
- Appropriate definition of financing scheme (PPP or public procurement).

Need for appropriate feasibility study

In general, projects have more chance of success when due attention is paid to planning and a detailed feasibility study has been undertaken also according to EIB (2004)[6] that recommended that projects must be financially robust and economically and technically viable to obtain financial support.

Poor feasibility studies often resulted in financially unsustainable projects. These failures might have been avoided with better project preparation (Cuttaree et al., 2009).

Priemus, Flyvberg and van Wee (2008) emphasized that problems of cost overruns and demand shortfalls start already in the initial stages of the decision-making process mainly due to: lack of appropriate problem analysis, poor option analysis, ambiguities about scope, absence of programme of functional requirements, and imperfect process architecture. Therefore, it would be important to devote more attention especially to forecasts of transport demand and investment costs. On the basis of a statistically significant study Flyvberg (2008)[7], showed that forecasts' inaccuracy is a constant over time and space. Flyvberg (2014) concluded that it is also independent from the type of project ownership (public, or private). In particular, major, greenfield and complex projects shown an high degree of uncertainty that made their implementation a challenging task.

With respect to forecasts of transport demand, a point worth to be stressed is that accurate estimates of transport demand are important in particular about user-charged projects (the World Bank, 2005(a)). Monsalve (2009) and Costantini et al. (2012) remarked that sensitivity and risk analyses carried out on transport demand might support the appraisal the robustness of the financial model with respect to changes of the initial assumptions. Such analysis is critical, for example in a context where road usage was free before the implementation of a toll project; according to users' willingness to pay (WTP), part of the transport demand may, switching to parallel roads or free routes, reduce the revenues foreseen.

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5 This assumption finds support also in Leijten et al. (2010). It was suggested that the analysis of cases should be based on objectifiable variables, like time and costs, instead of non-objectifiable such as quality and safety, which are more difficult to defend. See also van Wee and Flyvberg (2010).

6 See also Clifton et al. (2013).

7 See Chapter 7 in Priemus, Flyvberg and van Wee (2008). Inaccuracy has been demonstrated across the 20 nations and five continents.

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Similarly, Cuttaree and Mandri-Perrott (2010) concluded that when subject to financing scarcity, projects must be well-dimensioned to respond to existing needs and appraised through adequate and robust feasibility studies. To avoid over-dimensioned/optimistic projects, traffic forecasting should be based on WTP of the users for tariff proposals, like in case of tolled motorways. A similar concern emerges also from the final recommendations of the report of Committee of Public Accounts (2005). With respect to the development of UK high speed rail network, it was acknowledged that a good planning and preparation process influences the success of major infrastructure programmes.

The main causes of error in costs estimation can be referred to changes in the project specifications and design and changes in quantity and prices (EVA TREN, 2008 and Queiroz, 2005). However when accounting for costs overruns, political explanations seemed dominant (van Wee and Flyvberg and 2010, Cantarelli, et al., 2010).

The lack of attention to project evaluation may support a willingness to use ever-larger amounts of debt in project capital structures. Even high-risk projects faced heavy debt servicing burdens (Estache, Juan and Trujillo, 2007). Accuracy of traffic forecasts is relevant for example for tolled roads to prevent financiers against underperformance leading to default (Bain, 2009 and Monsalve, 2009) and delays (Cuttaree et al., 2009).

4.2 Lessons learned and project characteristics

This section presents findings that have emerged from the review of the literature that are related to the **influencing variable** used to investigate the deviations from the expected outcomes. It is worth remarking that every dimension cannot be assumed as totally independent from the others. Overlaps and relationships amongst them exist and different levels of analysis are possible. The structure assumed has been used in view of the methodology of analysis of the case studies presented in Chapter 5.

4.2.1 Transport modes

Transport mode is relevant for both PPPs and all public investments, even though their influence is different: PPPs tend to concentrate on revenue generating projects, and on some modes (road links, airport and port nodes) leaving the non-revenue generating projects mainly to public financing. The review of the literature with respect to the transport mode aims to highlight the relevant differences and how their characteristics may correlate to funding and financing schemes.

Amongst transport modes, **road** projects seem more suitable for PPPs, as technically straightforward, relatively low budget and characterised by a low pace of development. According to Bain (2009), it is considered a strong candidate sector for the early roll-out of a PPP programme and also very good to lock-in the maintenance phase, often an early victim in times of public sector financial stress.

In relation to the **port** sector, because of long lead times, risk quantification and allocation is reported as the most impacting issue (Major Projects Association, 2013).

Interesting findings come from the analysis of COST (2013) case studies. **Ports and airports** are more likely to attract private capital, because of the ease with which profitable terminal operations can be separated

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from expensive items of infrastructure[8], from which it is difficult to generate revenues. Meunier and Quinet (2010) emphasised that amongst the risks, while the construction risk is rather low, the most important is that related to transport demand and that private, or private-like, management is better to cope with it.

Dealing with **rail** projects, the size of the investment matters when procuring in form of PPPs, as usually bigger and more risky (Bain, 2009). Rail projects hardly attract private finance, particularly for track and other basic infrastructure. This occurs not only because of the size of investment needed, but also for the complexity of the networks, uncertainties surrounding the interface with rail services and the high level of regulations (COST, 2013). Short and Kopp (2005) concluded similarly discussing about the political commitment to railways. From a private perspective investments could be hardly justified due to several reasons, like: declining market share, low rates of return, large sums needed to achieve impacts and high maintenance costs[9]. Therefore, rail investment and user charge in rail transport without accompanying policy measures might be costly and ineffective.

Eventually, **urban public transport** PPPs have been dominated by franchises or management contracts for bus networks, and schemes involving private investment in metros or light rail (COST, 2013). As regards tram and metro systems, the outcomes of projects financed by the EIB have been negatively influenced because of an unbalanced allocation of the obligations to the private sector. Moreover in the cases considered lengthy arrangements in the financing process were an indication of deeper difficulties.

4.2.2 Project size

The size of a project is a characteristic deserving attention for both PPPs and all public investments as it could be related to a higher level of complexity resulting in larger costs and longer implementation phase.

Project size has been identified as a critical variable, also because regardless of revenue potential, projects needing large investment costs are more difficult to finance (Cuttaree and Mandri-Perrott, 2010). Project size makes more difficult private investment due to longer planning horizons, design complexity[10], multi actor process involving and risks increase.

As project size increases, so does project risk. When a concessionaire finances a project through debt and equity, the larger the project is, the higher the borrowing needed, as PPP projects usually have a high proportion[11] of debt relative to equity. For instance, with respect to transport modes as most motorway PPP projects are expected to generate a significant share of revenue from tolls, there is a considerable risk in large projects that the traffic would prove insufficient for the concessionaire to service its debt. In such cases, lenders would be reluctant to provide large-scale financing (Cuttaree et al., 2009).

In order to mitigate size-related issues and risks, like cost overrun and delays due to an inherent level of complexity, large projects should be reduced in scale, giving preferences to a phased approach to construction (Cuttaree et al., 2009).

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[8] Like for example a runway of an airport, or a breakwater of a port. These items are functional and complementary for the operations of the profitable part of the project, but need large investments.

[9] For example, they supported this consideration with figures from German railways, where it was estimated that every 100 Euro invested in rail means annual maintenance costs of 40 Euro.

[10] Statistical evidence shows that complexity and unplanned events are often unaccounted, leaving budget and time contingencies inadequate. In this regard, big projects need non-standard technology, increasing the risk that unforeseeable event may occur during implementation.

[11] But also in absolute values.

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4.2.3 Risks and their allocation

The return on equity required by the shareholders is directly linked to the perceived risk profile of the project, sector and country. The lenders also use project risk level as a basis to set the interest rate. As a result, the concessionaire cost of capital can increase by several percentage points because of the perceived risk of the project. The direct implication is that shareholders and investors ask for a higher payment (from users, or Government) because of the higher cost of capital and to compensate for the higher risk (Cuttaree et al. 2009).

Firstly, there are risks that design, construction or commissioning of the facility are carried out in a way that adversely affect cost and/or service delivery. These risks may occur due to faulty construction techniques, cost escalation and delays in completion of works.

Another risk is linked to the complexity of the project. Statistical tests showed there is a relationship between the length of the implementation phase and the cost escalation, where a longer implementation phase tends to result in a larger cost escalation (Flyvbjerg et al., 2004).

According to Flyvberg (2014), a vicious cycle may start if the implementation and construction phases take longer time than expected, ending in the so-called "debt trap". If a delay occurs, revenue inflows are postponed into the future and for debt-financed projects the following escalation may be triggered: debt grows, due to lack of revenue stream to service interest payments, which are then added to the debt, which increases interest payments, and so on. This issue was previously considered also in Estache, Juan and Trujillo (2007) and HM Treasury, (2012), wherein it was concluded that delays in completion of works can be caused also by constrained credit conditions generating shortage of financing resources for project implementation.

Risk allocation is another important topic, as it influences the mix of contributions from the private sector, the government and the tariffs charged to the users. While risk is an important issue for both PPPs and public projects risk allocation between public and private parties is an important topic especially dealing with PPP projects (Queiroz, 2005; HM Treasury, 2012; Dimitriou, Ward and Wright, 2013; Iossa, Spagnolo and Vellez, 2013; and the World Bank, 2014).

As a general principle, risks should be transferred to the parties that have relatively more control over the risk factor and that are more able to bear it. Allocating risks to those best able to manage them allows reducing the related costs[12]. This reduced cost of risk is the key mean of delivering Value for Money (VfM) to the public sector and in successful PPPs more than offsets any higher cost of finance from private vis-à-vis public borrowing (EIB, 2004).

Findings from past experiences led to the conclusion that how well risks are addressed is very important to manage uncertainties and complexities (Cuttaree and Mandri-Perrott, 2010).

The main risk faced by the public sector is that actual costs exceed the forecast. Cost and time overruns are commonplace in traditional procurement. The transfer of construction risk implies that the private sector partner prices such a risk. In other words, construction costs are expected to be higher in PPPs than in traditional public procurement (HMT, 2004). Blanc-Brude et al. (2009) have estimated that, on average and across more than 200 European road projects, the ex-ante cost of construction is 24% higher through PPPs than through traditional public procurement. This difference can represent the pricing of the construction risk

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[12] See also the World Bank, 2005(b) on whole-life approach and maintenance strategy.

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that is transferred to the private-sector partner, but could be also seen at least in part as a lower "optimism bias" of the private sector in comparison to the public one. Even though PPPs have lower cost overruns than public projects, they conclude that the cost efficiency of private management compared to the public one is probably limited.

In project structuring, one of the most controversial risks present in transport projects is related to the allocation of demand risk. This is even more pronounced in the case for new projects since, as discussed previously, demand is more difficult to predict accurately.

In most of the initial PPP projects in the ECA region[13], the demand risk was fully borne by the private sector. When traffic proved lower than forecast, the concessionaire had no other option but to ask for Government support. In the present investment climate, the toll road model that transfers demand risk to the private sector is considered no longer viable, even in developed markets such as the UK. In more recent years, there has been an increasing use of availability payments that, in practice, transfers all demand risk to Government, as the concessionaire will be guaranteed to receive a payment regardless of the level of use of the transport service (Bain, 2009 and Cuttaree et al. 2009).

When the private sector is fully charged of investment costs, a full transfer of demand risk to the operator might raise the cost of capital substantially, calling for higher user charges to reimburse investments. It may then happen that an excessive demand risk wipes out the project's benefits because the resulting cost-covering user charges are so large that users prefer to seek alternative services, thus making the project unbankable (Iossa, Spagnolo and Vellez, 2013).

As a general rule (Estache, Juan and Trujillo, 2007) demand risk tends to be lower where the end-user is represented by corporate, or commercial clients, given their higher payment capacity of tariffs and charges (i.e., airports, ports, cargo railways, etc.), while in transport infrastructure projects where the end-user is represented by consumers the risk tends to be higher (i.e., urban transport, toll roads, etc.).

4.2.4 Procurement and tendering

How procurement and tendering feature in the preparation phase of a PPP project may influence the completion within budget and time.

An open, competitive, transparent and flexible procurement process is an important factor and a key condition for success of a PPP. The tendering process can be a complex exercise, requiring highly skilled people on both public and private sides (EIB, 2004).

Cuttaree et al. (2009) argued that a non-competitive environment may hamper public acceptance and lead to costly negotiations and even in reversal of decisions in the case of a change of the government. Moreover, in the case that international financial institutions were prevented from advising about the structuring and co-financing of projects, because of their procurement rules, this led to unnecessary delays and cost increases.

Similarly, Cuttaree et al. (2009) reported cases of projects having a procurement process featuring limited, and sometimes opaque, competition that resulted in lower VfM, public resistance, contract renegotiations and failure.

[13] The ECA region is defined as Central and Eastern Europe (CEE), South Eastern Europe (SEE), the South Caucasus, Central Asia, the Russian Federation, and Turkey.

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The absence of competitive bidding also stretches negotiations longer than normal, due to increased uncertainty perceived by potential investors. Hence, higher levels of fairness and transparency can be reached through a procurement process finalised to test the market and involving project sponsors and lenders throughout the bidding process. Nevertheless, decisions about the procurement process should not be taken at an early stage, but after the development of a robust business case, or feasibility study, to avoid underperformances (KPMG, 2010).

Flexibility in the procurement process should be allowed to reach financial close and this can be obtained by giving more time to bidders to submit comparable proposals that consider financing uncertainties.

4.2.5 Institutional framework

Projects may be implemented in isolation from the sector policy, with the need for specific laws or regulations considered only late in the process. Therefore, appropriate governance, legal, regulatory and institutional frameworks specifying the "rules of the game" for the parties involved can mitigate project related risks and create a favourable environment for attracting private financing.

Whether projects are public, private, or PPPs, firstly they should be embedded within a sound governance framework in which the entity in charge of project's development is held accountable with respect to contractual agreements. The governance framework set should also avoid improper relationships, for example occurring when an entity is left operating for time exceeded real needs. If the institutions with responsibility for developing and building infrastructure projects effectively enforce measures of accountability, then the misrepresentation in cost, benefit and risk estimates, could be mitigated (Priemus, Flyvberg and van Wee, 2008).

Secondly, the legal and regulatory framework should provide adequate protection and obligations for all parties involved in PPP contract, considering in particular: the long-term nature of transport projects (Major Projects Association, 2013), the possibility of amendments during project's lifespan (the World Bank, 2014) and contract renegotiations (Cuttarre et al., 2009). Also the experience described in the World Bank (2006) proved that the best way to mobilize private capital is to guarantee a sustainable and credible policy and regulatory framework governing investments in the provision of public services. Besides, the institutional framework should support and give incentives for PPP implementation, with viable coordination between the different parts of government involved.

Thirdly, within the implementation framework assumed, the political decision makers need to have the authority to drive them throughout the entire implementation process (KPMG, 2010). Where a government lacks of control on the project, turbulence and instability of the context may raise issues (Queiroz, 2005), the extent of which is likely to be attributable in part to the long lead times of many transport projects, with the consequent likelihood of demographic, political or policy changes during the lifetime of the project.

Finally, a strong sector policy and regulation is essential for the sustainability of a PPP project. Some sectors such as railways are unlikely to attract private sector investment in the absence of reform and clarity regarding sector regulation. The financial sustainability of a light-rail, or metro, is a function not only of the specific characteristics of the project, but also of mobility policies (e.g., limitations against the use of car mode). A lack of clarity, consistency or fairness will increase the perceived risks of investing in the project (Cuttaree et al., 2009).

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4.2.6 Macro-economic context

Changes in macro-economic context became relevant since the global downturn occurred after 2008. Shocks can have unexpected effects on public finance sector and a government might not fulfil its PPP-related contractual obligations or cannot guarantee the financial flows necessary to complete ongoing public investments. Financial shocks can also hit private investors, however, even more likely than public budgets.

As demonstrated by the global economic crisis, exogenous uncertainties concerning aspects like the macro-economic trends and energy prices tend to grow. These uncertainties affect also elements relevant for transport projects, like cost of capital, or transport demand. Especially PPP schemes are more difficult to apply under uncertain conditions as they prefer stable country's macro-economic context (Queiroz, 2005). In this respect, countries with mature domestic capital market can reduce sensitivity to currency fluctuations (Cuttaree et al., 2009).

Since the financial crisis, the PPP market has changed in three main areas: project scope, funding and financing and commercial and procurement (Cuttaree and Mandi-Perrott, 2010). As private behaviour is pro-cyclical, the time of crisis has restricted the scope of financing, increased perception of risk and made the private sector more conservative with regard to project size and PPP type. Securing private financing has become more complex, requiring additional government financial support and guarantees, and reducing potential for PPP project off-balance sheet and PPP arrangements.

The perception of a higher risk influences its allocation between the government and the private sector, not only with respect to the demand risk, but also about other risks that the private sector would be willing to assume. Moreover, procurement process flexibility may need to increase to allow the concessionaire to reach financial close.

The policy approach adopted especially after the crisis that begun in 2008 reduced fiscal space for PPPs across Europe. As a result, both private and public are becoming more selective and a tendency can be observed towards smaller projects as concluded in Kappeler and Nemoz (2010). In general, shortage of public funds increases the need of improving the quality of the ex-ante analysis, to reduce the risk of investing scarce resources in lame ducks.

4.2.7 Social acceptance and opposition

The social environment of a project should also be considered an element affecting its final outcome, notably with respect to the level of satisfaction of those with a legitimate interest.

Projects should be supported and legitimated politically, otherwise the population involved, or affected, could not understand the purpose of the project and its related impacts (KPMG, 2010).

In relation to relatively expensive road projects, Bain (2009) noted that the strength of public opposition to some tolled projects may be underestimated. This frequently led to a tariff revision with knock-on effects on project cash flows, eventually requiring compensation from promoters.

4.3 Conclusions

Across the dimensions considered, recurring variables are the variations with respect to forecasts of investment cost, transport demand and time schedule of completion of works, **namely the actual outcomes achieved**. According to the findings on the lessons learned (section 4.1), through the outcome variables it

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must be demonstrated the soundness of the general objectives and VfM for implementation at the feasibility stage. This can ensure that all potential benefits can be obtained once the project is completed.

On the other hand, the review of the literature on project characteristics (section 4.2) allowed to identify a set of **variables that may influence the outcomes** a project can achieve and can be correlated to the overall level of performance. Some are related to inherent characteristics a project features, like transport mode and project's size, while others may give guidance on the deviation from the expected outcomes in relation to exogenous factors, like the macro-economic context and implementation frameworks.

This set of variables should not be assumed as exhaustive for the purpose of the analysis. There can be other influencing variables beyond those found in the literature review. For this reason, the analysis has been enlarged looking for other influencing variables in relation to: physical characteristics, type of field, level of competition, level of functional integration and type of users.

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5. Methodology

5.1 Introduction and approach

Usually the analysis of a project initiates from the decision to invest, but in this approach, the soundness of the general project objectives, and of the feasibility studies is not under scrutiny. These are assumed to be decisions concluded. Furthermore, the scope of the analysis is not to conduct an ex-post assessment as such. Rather, the purpose of the analysis is to check to what extent the outcomes of a set of case studies are different from forecasts in the most neutral way and whether relevant characteristics can contribute to explain these differences. Notably, cases may over-perform with respect to some criteria and under-perform with respect to other.

The main purpose of the approach is to compare a selected number of case outcomes with their initial objectives. Such approach requires to carefully consider and select the outcomes to be monitored, in order to minimize the risk of inconsistency and confusion that would undermine the outcome of the comparative analysis. As the review of the literature anticipated (section 4.1), the outcomes deserving more attention are those that fulfil government objectives and demonstrate that a project has VfM for implementation.

This is because both PPP and public projects involve public finance to different extents and their analysis must be performed in the perspective of VfM they can yield. In this view, the most important outcomes emerged from the lessons learned have been identified in the deviations from forecasts of project investment costs, transport demand and time schedule of completion of works. In addressing the reasons for deviations from these outcomes, these have to be investigated with respect to the variables that the review of the literature has identified as significant (section 4.2) and integrated with information on other influencing variables (e.g., physical description) and obtained from the protocols.

Given the above and in attempting to analyse the BENEFIT case studies and derive lessons from them, there are two main issues to be addressed.

The first issue is how to define good practices. As anticipated above, in this Task 4.1 the definition of good performance is based on a comparison between the project objectives and project outcomes, i.e. between the ex-ante design and the actual outcome, namely the ex-post situation, which includes also the project implementation phase. So the first question to be addressed is whether the final outcomes introduced above are the expected ones, and in the case they are not, assess to what extent they differ and thereafter investigate what variables might have played a major positive, or negative, role in determining this different performance.

The second issue is how to analyze and derive lessons from a heterogeneous number of investment projects, located in different countries and regions, with highly differentiated characteristics, belonging to different transport modes, and financed by private or public entities with different financing schemes. In order to be able to compare and draw lessons from such a diverse database, it is necessary to work progressively.

The first step consists of the identification of the potentially relevant characteristics that might affect the outcomes of a project. In this phase, guidance has been provided by the findings presented in section 4.2. and the protocols enclosed in the Appendix allowed to collect this set of ex-ante and ex-post data across all case studies made available.

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Once the necessary data has been assembled the following steps are:

- organize the data in a way that allows to highlight similarities or discrepancies and to link them to the projects' outcomes;
- ensure comparability and relevance providing a standard grid for processing the case studies;
- identify under- or over-performance and check whether the selected project characteristics play some role in influencing the outcomes;
- provide an interpretation of the results and draw the lessons learned.

Given the large number of cases, many of them showed mixed performance, over-performing with respect to some characteristics and under-performing in others.

The first goal of the present analysis is to explain reasons and provide lessons with respect to the outcomes achieved, highlighting the correlations amongst variables explaining these outcomes. As a second step and where possible, an overall assessment is produced, deriving comparative conclusions on the outcomes and enlarging the perspective of the analysis. According to the review of the literature by topic, the variables range from project characteristics (e.g. mode and project size) to the political, regulatory and economic context, to the funding and financing schemes and others.

Again, it is worth stressing that the analysis tries to detect whether some of these elements are associated with differences in the outcomes achieved. The analysis is not aimed at ranking the cases under study, nor to conclude with a comparison amongst them, but to draw conclusions with respect to variables influencing the outcomes.

5.2 Methodology of the Descriptive Statistics analysis

This analysis of the case studies has been performed in a stepwise approach within the framework shown in Figure 5.1.

As anticipated in Chapter 3, some limitations exist about the database assembled. The initial combination of projects from COST and OMEGA has been enriched with additional cases for which data and relevant information could be accessed. Information was not always readily available, or allowed to be registered due to reasons of commercial confidentiality. Since the sample contains those projects for which details were available it cannot be considered a fully random sample in statistical terms, therefore it is also not representative of the universe of transport infrastructure projects delivered. Hence, the analysis bears the inherent limitations of the database analysed and the results are indicative and should be generalised with caution.

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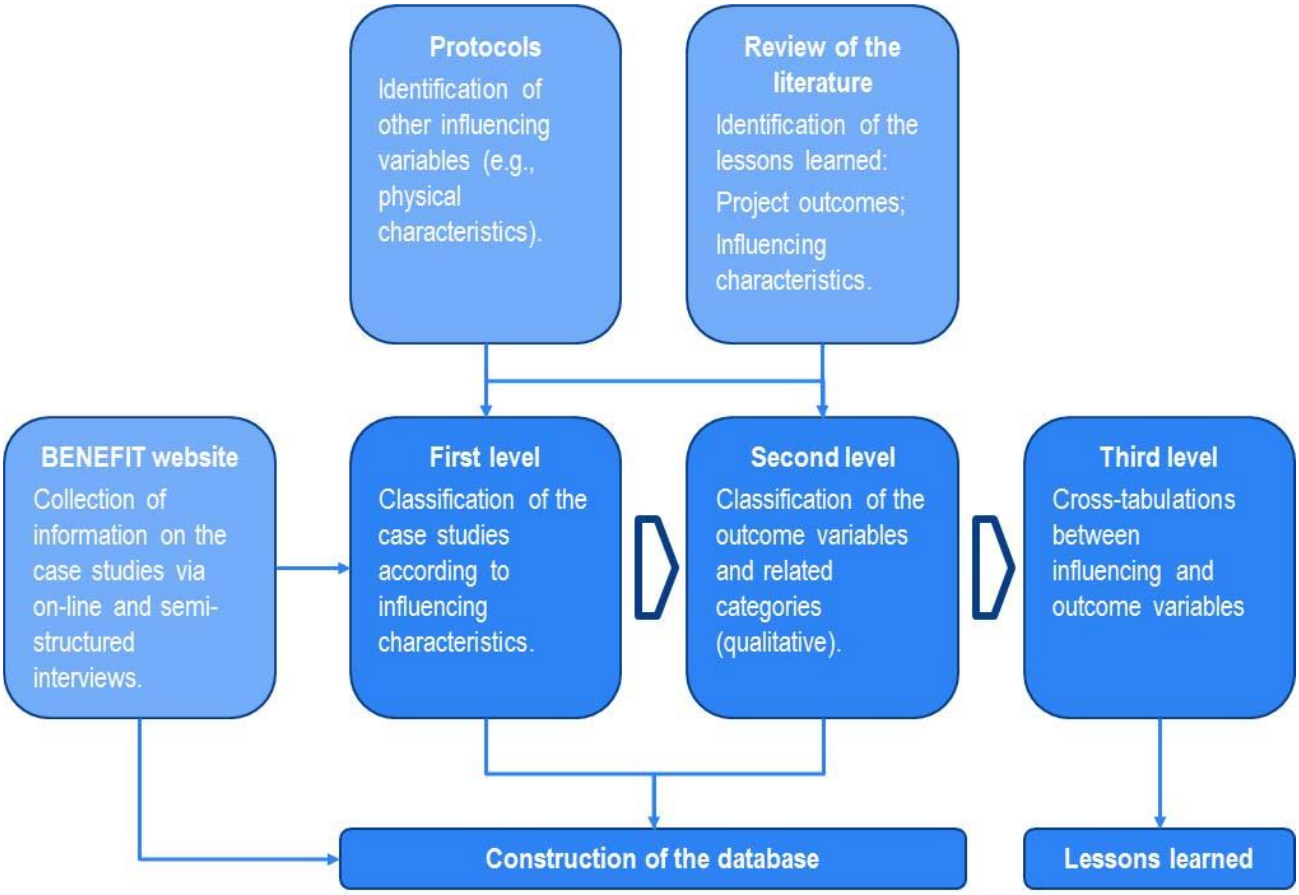

Figure 5.1: Framework and levels of analysis

The **first level of analysis** draws from the information collected through the protocols and consists of the classification of the case studies and their segmentation into categories, according to a number of influencing variables.

As anticipated, the influencing variables have been identified consistently with the sections of the protocols employed for the purpose of this task and according to the literature review presented in section 4. As an example, a few influencing variables are summarised in Table 5.1.

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Table 5.1: Example of influencing variables[14] and related categories

Influencing variables	Category
Financing schemes	PPP, Public
Principal transport mode	Road, Rail, Seaport, Inland port, etc.
Project size	Range of investment costs
Physical characteristics	Link, Node, etc.
Per capita GDP	Higher, in line and lower than expectations
Tendering	Two stage procedure, short list, negotiations, etc.
Type of expected revenues	User charges, usage payment, shadow tolls, etc.
Risks	Allocation, Assessment and Mitigation

In this approach, some of the influencing variables assume discrete values and groups can be immediately defined (e.g., the financing scheme identifies two groups: PPPs and public projects). Other variables are continuous (e.g., the total investment cost) and for them groups have been defined by adopting ranges (through meaningful thresholds) based on the distribution of the values in the whole sample. In other cases, the information remained at a purely qualitative level, for example describing the timing of the project with respect to per capita GDP, income, and unemployment rate (higher, in line, or lower than expectations).

The outcome of this first level of analysis takes shape in the form of the database wherein all case studies made available are described according to the influencing variables considered important for the purpose of the analysis. An example is shown in Table 5.2.

Table 5.2: Example of project classification according to the influencing variables

Nr.	Project	Financing scheme	Principal transport mode	Project size[15] [million €]	Physical characteristics	Per capita GDP	…
1	XXXX	PPP	Road	500-1.000	Link	Higher	…
2	YYYY	PPP	Road	lower than 100	Link	Below	…
3	ZZZZ	PPP	Rail	higher than 1.000	Link	Below	…
4	JJJJ	Public	Port	500-1.000	Node	In line	…
…	…	…	…	…	…	…	…

In the **second level of the analysis** the categories to summarise the outcomes of the case studies are defined and referred to the **outcome variables**, namely investment cost, transport demand and time schedule of completion of works.

Since sufficient quantitative information has not been made available across the influencing variables describing the outcomes, the categories have not been defined according to a quantitative numeric criteria comparing actual and forecast values (i.e., in terms of percentage variation).

The database shows many gaps and for some of the case studies only a qualitative assessment is available, hence a simpler categorisation has been preferred based on a qualitative scale. Therefore, also in cases where quantitative figures were made available, these have been translated into a qualitative scale (e.g.,

14 See Appendix A.6 for a complete list of the influencing variables.
15 Assumed projects' size depends on the distribution of values made available in the database.

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where the ratio between actual and expected demand is below fifty per cent then “demand is far below expectations” and so on). These qualitative categories are summarised in Table 5.3.

Table 5.3: Outcome variables and qualitative categories

<table>
<tr><th>Outcome variables</th><th>Qualitative category</th></tr>
<tr><td>Investment cost</td><td rowspan="3">• far below forecast;
• below forecast;
• in line with forecast;
• exceeded forecast.</td></tr>
<tr><td>Transport demand</td></tr>
<tr><td>Time schedule of completion of works</td></tr>
</table>

Once this second level of analysis is completed, the result is a refined database in which the influencing variables (shown in Table 5.2) are associated with the outcome variables and presented according to the categories assumed. An example is shown in Table 5.4.

Table 5.4: Example of projects classification according to categories

Nr.	Project	Influencing variables			Outcome variables		
		Financing scheme	Principal transport mode	…	Transport demand	Investment Cost	Time schedule of completion of works
1	XXXX	PPP	Road	…	below forecast	exceeded forecast	below forecast
2	YYYY	PPP	Road	…	below forecast	in line with forecast	exceeded forecast
3	ZZZZ	PPP	Rail	…	far below forecast	exceeded forecast	in line with forecast
4	JJJJ	Public	Port	…	exceeded forecast	exceeded forecast	below forecast
…	…	…	…	…	…	…	…

In the **third level of the analysis**, the two classifications obtained in the first two steps are compared formulating the core of the Descriptive Statistics analysis. The objective is to assess whether some groups of projects show significant difference for one or more classifications. This third level of analysis performs elaborations with respect to all case studies, but also keeps separated the analysis by financing scheme, in order to identify the level of performance and the influencing variables in these two major groups.

Based on categories assumed (like in Table 5.4), this analysis mainly consists of creating cross-tabulations between one outcome variable and the influencing variables. For instance, the indicator regarding the time schedule of completion of works can be cross-tabulated with the size of the project, as shown in Table 5.5[16].

[16] Chi-squared test can be used to check whether there are significant differences in terms of performance across the groups. Therefore this analysis will allow identifying what elements have a significant effect on the outcomes of the projects.

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Table 5.5: Example of cross-tabulation (absolute values of case studies falling in each category)

Project size [million €]	Time schedule of completion of works					
	Far below forecast	**Below forecast**	**In line with forecast**	**Exceeded forecast**	**Total**	Share
lower than 100	0	2	1	0	**3**	9%
100-500	1	2	4	4	11	31%
500-1.000	0	3	4	5	12	34%
higher than 1.000	0	1	2	6	9	26%
Total	**1**	**8**	**11**	**15**	**35**	100%
Share	3%	23%	31%	43%	**100%**	

Once the cross-tabulation has been assembled as in the table above, the absolute values are transformed into shares, to provide a discussion of the result obtained and highlight relevant patterns across the cases studied. An example is shown in Table 5.6[17].

Table 5.6: Example of cross-tabulation (shares of case studies falling in each category)

Project size [million €]	Time schedule of completion of works			
	Far below forecast	**Below forecast**	**In line with forecast**	**Exceeded forecast**
lower than 100	0%	67%	33%	0%
100-500	9%	18%	36%	36%
500-1.000	0%	25%	33%	42%
higher than 1.000	0%	11%	22%	67%

According to the example above, for instance one can argue that small projects perform better in the database made available, since there exists a decreasing pattern of the share of the category “below forecast” across the size of the project (from 67% to 11%). Another pattern emerges from the category “exceeded forecast”, as in such cases the larger the project, the higher is the corresponding share of cases (from 0% to 67%).

The results obtained implementing the methodology conceived, in particular with respect to the third level of analysis are presented and discussed in Chapter 7. Subsections, from 7.1 to 7.3 focus on the lessons learned, hence on the cross-tabulations from which relevant findings can be inferred.

As an attempt to extend the previous methodology, a fourth level of analysis has been conceived. It consists in analysing the influence of the three outcomes variables simultaneously and investigating the overall performance through a synthetic indicator.

In this view, an overall index has been designed to summarise the three aspects analysed separately at the third level. Specifically, if an influencing variable appears to have always a positive, or a negative, effect on the outcome considered, it can be concluded that such feature has a positive, or negative, influence in general. In cases, where an influencing variable influences the outcomes either positively, or negatively, the role played is less recognisable. Hence, a general conclusion cannot be readily inferred.

17 In order to facilitate the analysis of the results and avoid dispersion of the observations, the two categories “far below forecast” and “below forecast” have been merged. See section 7.2.

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In this extension of the methodology, the overall outcome index assumes a simplified form and it is obtained by adding the outcome index of each variable. The synthesis of an overall outcome index implies the assessment of the relative weight of each outcome variable, which is context and stakeholder specific. (i.e., in terms of perceptions and goals). The approach used to modify the influence of each outcome has been done variable-by-variable. This way has been deemed more appropriate to show the effects of different weigths and limit the arbitrary level on their allocation.

A detailed presentation of the extension of the methodology, the elaborations carried out and the discussion of the main findings are gathered in the appendices A.4 and A.5.

Two final remarks before entering into the description of the database assembled (Chapter 6) and the discussion of the results (Chapter 7). The definition of the overall outcome index lays down important questions on the structure of the aggregate index and hence on meaningful interpretations that can be inferred to discover lessons learned.

Firstly, in relation to the structure of the overall outcome index there exists a methodological limitation. The additive aggregation function assumed implies that the three outcome variables are independent amongst them. Practically, if one of the outcome variables is negative, the overall performace might be positive, as compensated by the positive performance of the others. To avoid such compensation effect another type of aggregation function would be needed[18].

Secondly, attention should be given to the value of the aggregation for lessons to be learned. This means that, the overall outcome index should allow for the interpreptation of the results depending on the financing scheme used.

For PPP projects, the overall outcome index would be determined according to the financial outcomes achieved (e.g., the return on the capital invested) and hence the aggregate indicator should be read in view of the financial performance. The three outcome variables should be used as sub-indicators, finding an aggregation scheme to link them to the overall financial performance[19].

As regards public projects, the overall index would be determined through the outcomes a project achieved in relation to the social welfare (i.e., users and producers variations of surplus). The aggregation scheme should be read as an approximation of the welfare performance and the three outcome variables again as the sub-indicators of this proxy.

Using a simplified approach, independent from the financing scheme, is an arbitrary procedure that reduces the extent to which plausible interpretations for the aggregate performance indicator could be given. More sophisticated schemes would be needed to assign appropriate weigths to each outcome variables, but in this case the size of the sample and quality of the information avaialble put strong limitations. Hence, the extension of the methodology presented in Appendix A.4 can be assumed as a starting point, when more data will be made available.

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18 Like for example, a Cobb-Douglas, or constant elasticity of substitution (CES) function. Assuming an appropriate normalisation of the outcomes, the zero performance of one outcome would lead to a zero performance of the aggregate performance. An appropriate aggregation scheme should be designed also to normalise and weigh each outcome variable.

19 For example, if the actual transport demand is lower than forecast implies that revenues are lower than expected. Delays in completion of works/opening of the operation also lead to revenue losses and cost overruns reduce the profit margin.

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6. The BENEFIT Case Studies

6.1 Introduction

This Chapter describes the BENEFIT case studies in terms of availability of data and statistical information. In this context, it corresponds to level 1 and 2 of the methodology of the Descriptive Statistics analysis presented in Chapter 5.

6.2 Database description

The database assembled for the purpose of the analysis includes **81** case studies, of which **53** PPPs and **28** public projects, and covers eighteen European countries[20]. With respect to the transport modes the road sector represents the relative majority with a share equal to 43%, followed by rail and seaport (12% each), tramway (7%), airport and metro (6% each), while freight terminal, mixed and others gather the remaining.

The database has been organised according to the structure presented in section 5.2 of the methodology (see Figure 5.1). In this respect, the data extracted from BENEFIT's website (initially, in form of .csv file) has been manipulated to obtain suitable spreadsheets and structured to become the source from which drawn data for the elaborations of the three levels three of analysis.

As anticipated, the identification of the classification variables for this analysis has been done on the basis of the literature review presented in Chapter 4. The corresponding classification variables have been identified and selected from the sections of the two protocols described in Chapter 3.

Before the implementation of the analysis, a preliminary check has been performed on cases' data availability, for both quantity and quality. Such check has been deemed necessary to verify that the three outcome variables assumed as starting point of the analysis (see conclusions of Chapter 4) and the other classification variables on influencing factors used for cross-tabulations were supported by appropriate data availability.

In this respect, a reference threshold for data availability equal to 50% was assumed appropriate, although classification variables with lower rates have been considered to investigate specific aspects.
All in all, **167** classification variables constitute the base for the analyses performed (Table A.2 in Appendix provides with the list of all the variables). A summary on the classification variables and related availability of the information by range is shown in Table 6.1. The number of variables having more than 50% of the information is **58%** of the total, hence on average above the threshold assumed.

[20] Sixteen EU Member States, plus Norway and Serbia.

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Table 6.1: Number of variables by range of data availability

Range	PPP		Public		All database	
[0%-45%)	46	32%	58	45%	34	32%
[45%-50%)	10	7%	5	4%	11	10%
[50%-100%]	89	61%	66	51%	62	58%
Sub-total	**145**		**129**		**107**	
not applicable	22		38		60	
Total	**167**		**167**		**167**	

More in detail, the availability of data has been checked throughout the sections of both protocols. As anticipated in Chapter 3, the variables have been judged as not being equally relevant for the application of the methodology presented in Chapter 5 and hence those deemed more important have been highlighted shading the sections wherein they are displayed. Notably. the attention has been focused on the variables emerged being relevant from the review of the literature presented in Chapter 4. A detailed description of the availability of the data obtained is provided in the points below, according to the order of the sections in the protocols.

- WHAT: within the first section of the protocol, fifteen[21] out of twenty-four variables have been deemed relevant. The level of availability of data is well above the threshold assumed with respect to almost all the variables used to carry out the Descriptive Statistics analysis. The availability of data is close to the threshold assumed for one variable (i.e., the ratio of civil structures) and for two only is significantly below[22]. Eventually, data availability does not change across financing schemes. Concerning the influencing variables that explain deviations from the expected outcomes (see section 4.2.2), this section of the protocol provides with information on the size of the projects. The distribution of the observations in the sample is shown in the Figure 6.1, according to the categories used.

21 The fifteen variables initially considered became twenty after manipulations needed to facilitate the implementation of the analysis.
22 Other transport modes infrastructure included in the project and the ratio of particular equipment on investment costs.

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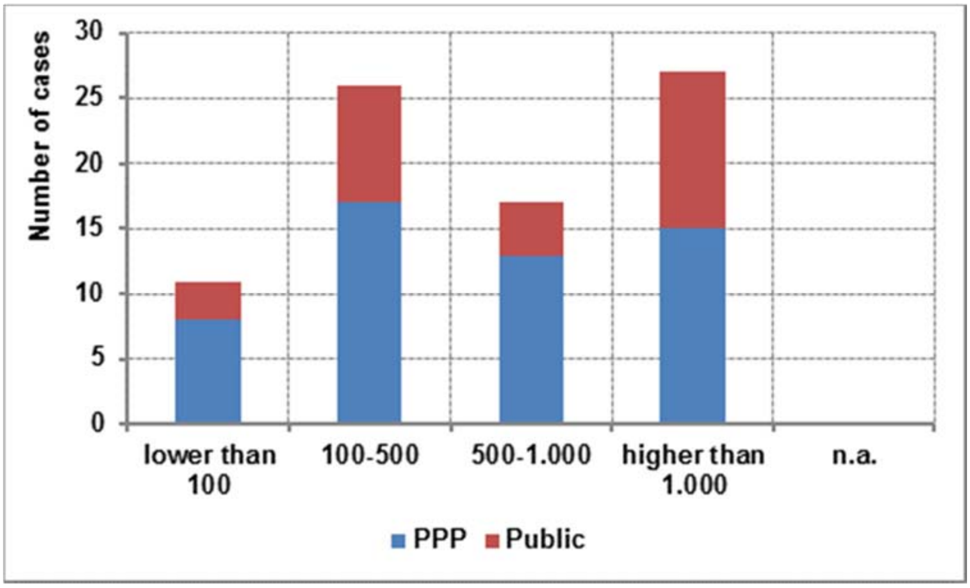

Figure 6. 1: Distribution of the case studies across categories of size

- WHO: this section was aimed to describe the Contracting Authority. The availability of data has not been checked in this section of the protocols, as none of the variables has been used to carry out the Descriptive Statistics analysis.

- WITH WHO/WHAT[23]: the availability of data has not been checked in these sections of the protocols, as none of the variables has been used to carry out the Descriptive Statistics analysis.

- WHO FOR: this section describes the users of the projects. In this section, only one variable out of three has been shaded and it refers to the type of users. In general, the information has been returned in 98% of the case studies. Referring to the financing schemes, PPP case studies obtained 100% of responses.

- WHY: this section includes information on the reason for selecting the delivery method/financing scheme. The availability of data of the variables in this section has been check, but none of them, neither belongs to shaded sections of the protocols, nor has been used for the purpose of the Descriptive Statistics analysis. In general, the level of information obtained is above the threshold assumed[24].

- WHEN: this section describes the timing in which a project has been developed. The three variables of this section have been shaded in the protocols to remark their relevance for the purpose of the Descriptive Statistics analysis. The information returned on the macroeconomic context of the region wherein a case study has been implemented is sufficient and above the threshold assumed, also

23 The section WITH-WHO concerns PPPs, while WITH-WHAT public cases.

24 The rate of availability of data shows a maximum of 96% for the variable describing whether a project is included in TEN-T, which is followed by a 84% rate of responses concerning the reason to choose Private (co)financing. Eventually, a 72% rate of responses has been gotten for Finance vs service needs (not available for public financed projects).

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across both financing schemes[25]. The distribution of the observations obtained in the sample assembled is shown in the Figure 6.2. From the left to the right hand side, three groups of four columns display the information across the categories used with respect to: per capita GDP (orange), per capita income level (blue) and unemployment rate (green). Within the groups, light colors identify PPPs, while dark colors identify public projects.

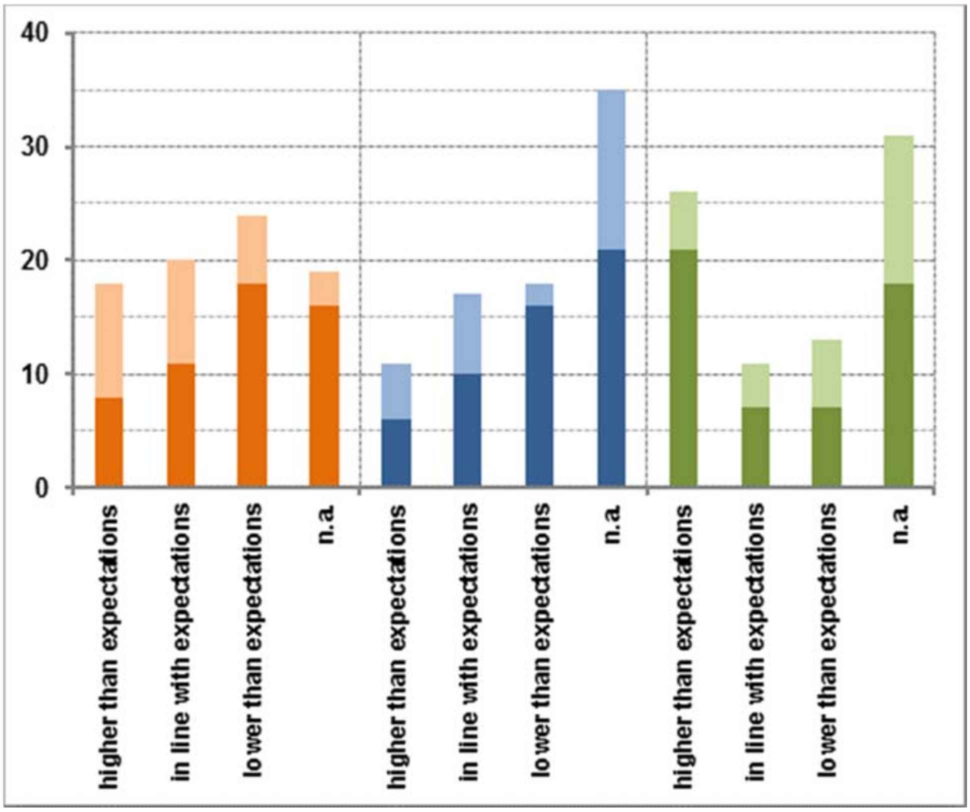

Figure 6. 2: Distribution of the observations across the variables of the section WHEN

- WHERE: this section gathers information on locality and market geography. All the variables in this section of the protocols (i.e., four) have been shaded for the purpose of the Descriptive Statistics analysis. The rate of availability of the information is always above the threshold assumed[26].

- WHICHWAY: the availability of data in this section is described through its subsections.

  → All in all, the variables concerning how project delivery has been structured obtained a good rate of responses. Although initially not included in the shaded sections, these variables have been used to some extent in the Descriptive Statistics analysis. With respect to the financing schemes,

---

[25] In general, the maximum (77%) has been reached on the per capita GDP, followed by the unemployment rate (62%) and the per capita income level (57%).

[26] The information on project locality and market geography has been returned almost for all case studies (95%), followed by population density (74%), level of industrialization (67%) and specific production activities started during/ after the completion of project (58%).

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the two protocols consider a different set of information. On the one hand, PPPs protocol concentrates on procurement/tendering and construction contract[27]. The information on public projects refers to procurement, tendering of construction and operation and maintenance. In this case, the rate of the information gathered is above the threshold assumed, excluding the set of variables on tendering of operation and maintenance (never higher than 11%) and the number of contracts (never higher than 7%).

→ With respect to the subsection on the revenue stream in the operating phase, all the variables have been included in shaded sections of the protocols. Despite their relevance, the rate of the availability of data is above the threshold assumed concerning two variables only, across both financing schemes[28]. Amongst them, the type of expected repayment revenues during the operating phase might be an important influencing variable. Although not explicitly emerged from the review of the literature, it can be put in relation with the dimensions of revenues risk allocation and public opposition to tolled projects (notably, in a context where usage was free before implementation). The distribution of the observations obtained in the sample assembled is shown in the Figure 6.3.

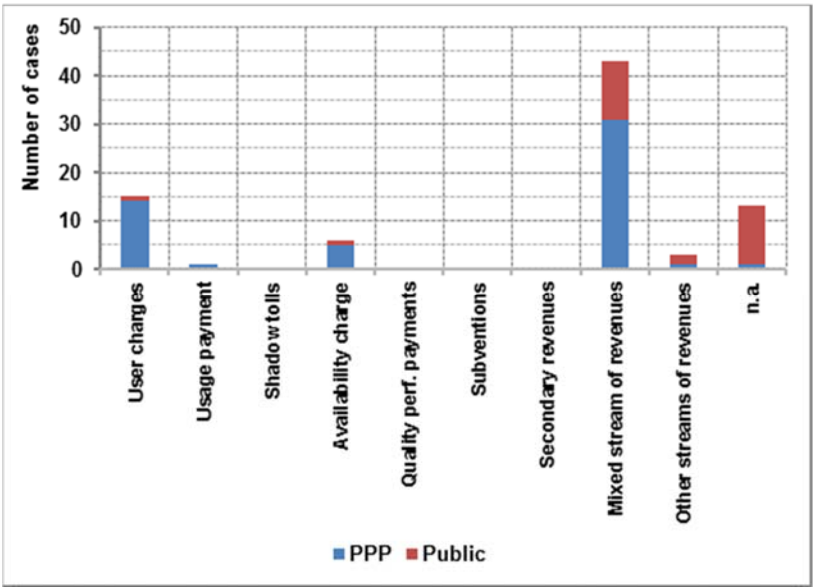

Figure 6. 3: Distribution of the case studies across the categories of type of expected repayment revenues during the operating phase

→ The availability of data in the subsection concerning the dimensions of the risk (i.e., allocation, assessment and mitigation) is above the threshold assumed for all the variables, but the one that refers to other risks. Although initially not included in shaded sections of the protocols, the dimension concerning the risks emerged, from the review of the literature, as an important

27 The rate of the information available is within the interval 62%-100%.

28 The variables refer to type of expected revenues during the operating phase and the information on the methodology to calculate user charges (imposed by the public authority, or other). Across the financing schemes, the information obtained on PPPs is above the threshold assumed for other four variables, while the coverage for public projects does not improve.

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influencing characteristic (see section 4.2.3). Hence, the data gathered has been used for the purpose of the Descriptive Statistics analysis. Across financing schemes, the rate of availability of data obtained for PPPs is generally higher than that of public projects and for these cases the threshold assumed is not reached describing the risks on exploitation, financial aspects and force majeure. The distribution of the observations in the sample, with respect to the allocation of the risk is shown in the Figure 6.4.

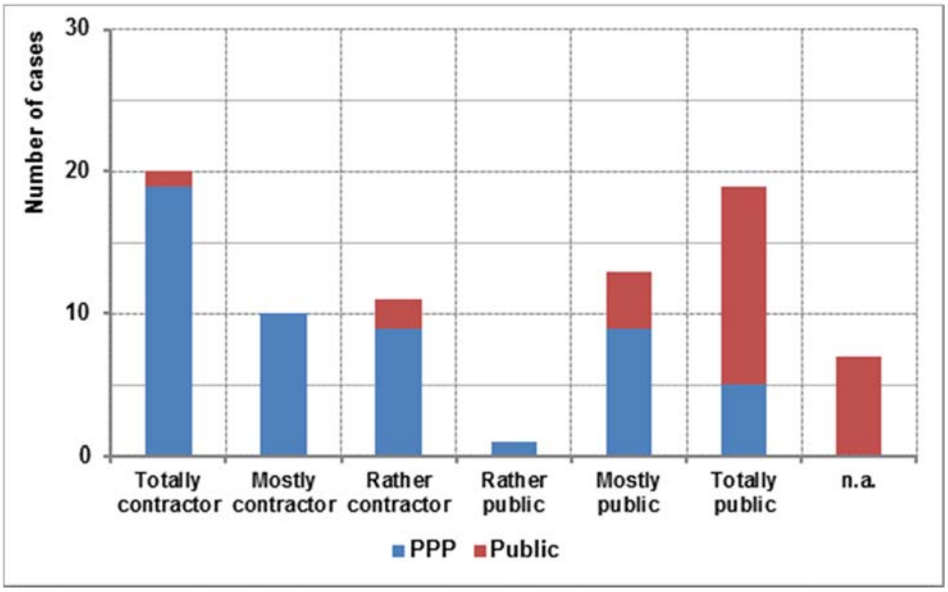

Figure 6. 4: Distribution of the case studies across the categories of allocation of risk

→ The subsection on project's income sources has been designed to gather information from PPPs case studies only. Out of five variables, the rate of the availability of data obtained is above the threshold assumed concerning the funding agent (i.e., the agent providing revenues) and the method of indexation[29]. None of the variables neither belongs to shaded sections of the protocols, nor has been used for the purpose of the Descriptive Statistics analysis.

→ The subsection on the performance indicators shows a rate of availability of data that changes across variables and financing schemes. In general, the rate obtained is higher than the threshold assumed about three out of eight variables and significantly improves for PPP case studies, wherein the threshold assumed is reached, excluding two variables. None of the variables neither belongs to shaded sections of the protocols, nor has been used for the purpose of the Descriptive Statistics analysis.

→ In the subsection of the protocols referring to the performance of the projects with respect to the costs, two out of nine variables have been included in shaded sections. In general, the availability of data has not reached the threshold assumed, excluding the variable on cost overruns (i.e., cost/budgeted of investment) that shows a rate equal to 52%. This dimension is one of the three classification variables used as starting point of the Descriptive Statistics analysis. As this

[29] The variable on which the charge is calculated, like for example the distance travelled, the number of passengers, the cargo loaded, etc..

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variable may be measured at different stages of the planning process a further investigation has been perfomed to infer on data comparability. In general, the information on the investment costs has been provided at an initial stage of the planning process, like for example: contract approval, concession contract ratification and date of financial close. Figure 6.5 shows the distribution of the observations across the categories.

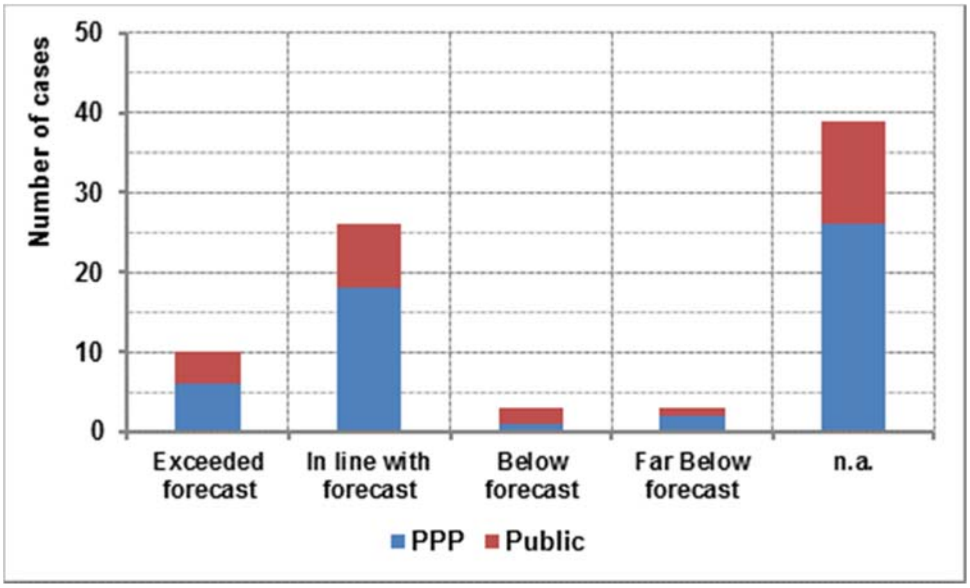

Figure 6. 5: Outcomes of the case studies with respect to forecast of investment costs

→ The following subsection was designed to gather information on the performance of the projects with respect to the revenues and five out of seven variables have been included in shaded sections. The rate of the availability of data is not even across the variables. In general, it is above the threshold assumed only with respect to the other two outcome variables used as starting point of the Descriptive Statistics analysis, namely the deviations from forecast of transport demand (79%) and time schedule of completion of works (56%). Across the financing schemes data availability slightly improves concerning the public projects. With respect to the stage of the timeline at which the information has been provided, transport demand (where available) cover the period of operation. The information on the completion of works can be readily elicited from the implementation process. Figure 6.6 and Figure 6.7 show the distribution of the observations across the categories.

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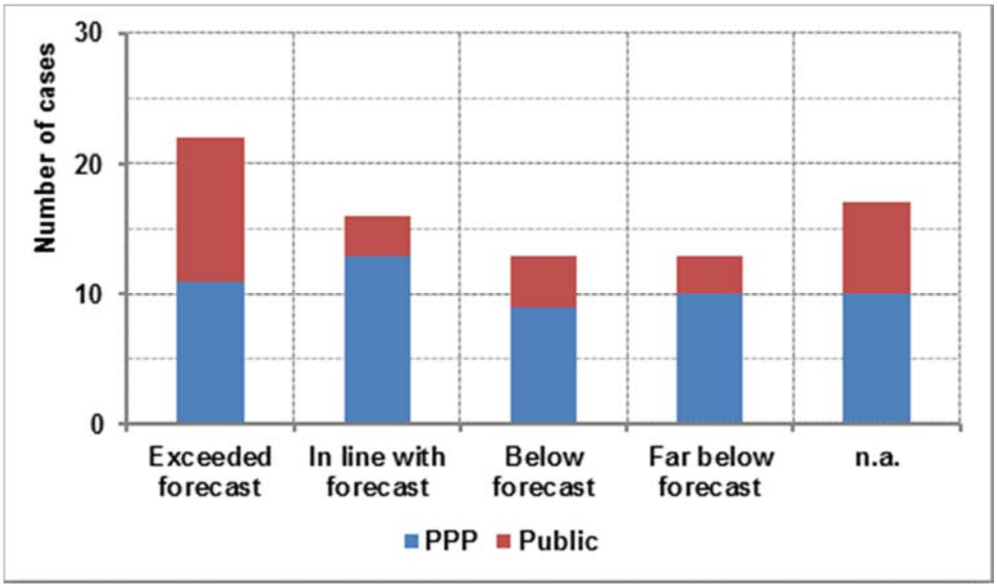

Figure 6. 6: Outcomes of the case studies with respect to forecast of transport demand

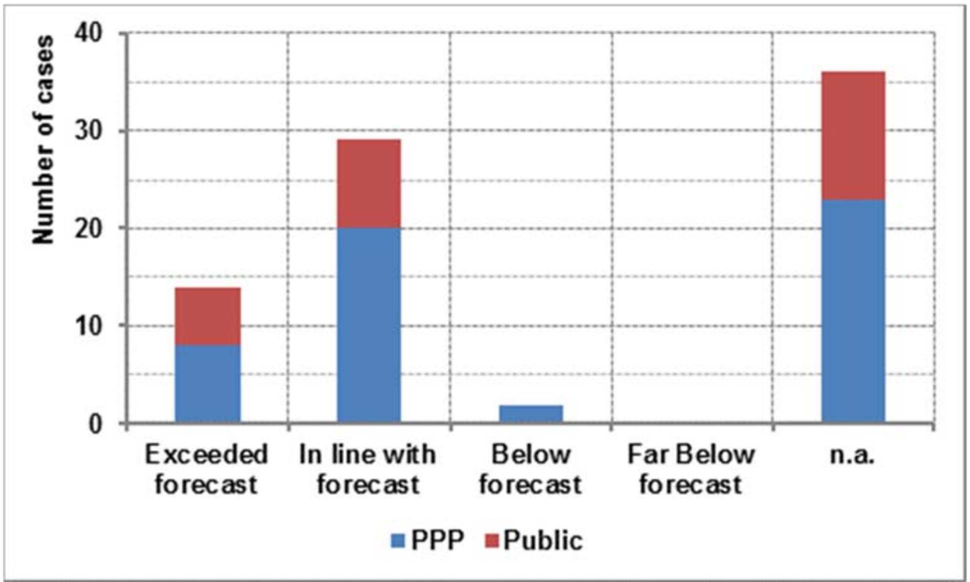

Figure 6. 7: Outcomes of the case studies with respect to forecast of time schedule of completion of works

→ The final subsection refers to re-negotiations of PPPs, after project awards. The rate of availability of data is significantly below the threshold assumed. None of the variables neither belongs to shaded sections of the protocols, nor has been used for the purpose of the Descriptive Statistics analysis.

- Data availability on project outcomes has been investigated with respect to four variables, of which one shared across financing schemes, namely the possibility of an early contract termination. In this respect, the level of availability of data obtained is slightly above the threshold assumed (55%). The

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other three variables considered concerns PPP case studies only and the information is always below the threshold assumed[30]. None of the variables neither belongs to shaded sections of the protocols, nor has been used for the purpose of the Descriptive Statistics analysis.

- In the subsection on the assessment with respect to transportation goals, all the variables (i.e., five) have been included in shaded sections. The rate of availability of data is above the threshold assumed only considering the variables referring to the main project purpose of the contracting authority (59%). The rate of responses returned for the other four did not reach the threshold assumed[31].

- The final section was aimed to gather other details on three specific impacts (i.e., economic, social and environmental). The level of availability of the data is always slightly below the threshold assumed. None of the variables neither belongs to shaded sections of the protocols, nor has been used for the purpose of the Descriptive Statistics analysis.

- Two additional variables not included in the protocols complete this summary on the availability of data. Raw information have been manipulated to elicit details on projects' maturity (i.e., the time between tender call and the date the project was conceived) and procurement (i.e., the time between tender call and project award). These have been obtained from the narrative sections of the timeline of the case studies used for the purpose of the Descriptive Statistics analysis. In general, the rate of availability of data is sufficient, but a distinction is needed across financing schemes, since PPP case studies are above the threshold assumed, while public cases are markedly below.

Data availability has been investigated also with respect to the case studies. The Table 6.2 gives an overview in this perspective, providing details on the number of cases by four availability ranges. With respect to the quantity of data, the number of projects having more than 50% of the information is **55%** in total[32], hence also in this case above the threshold assumed.

Table 6.2: Number of projects by range of data availability

Financing scheme	**Range of availability of data [%]**								**Total**	
	0-25		**25-50**		**50-75**		**75-100**			
	Value	**[%]**	**Value**	**[%]**	**Value**	**[%]**	**Value**	**[%]**	**Value**	**[%]**
PPP	0	0	21	40	25	47	7	13	**53**	**100**
Public	5	18	11	39	4	14	8	29	**28**	**100**
Total	**5**	**6**	**32**	**40**	**29**	**36**	**15**	**19**	**81**	**100**

With respect to the quality of the data, a more systematic and in-depth check has been carried out, notably concerning the case studies reported in the protocols as being "under construction", or "awarded not yet started". This step is deemed important in relation to the opportunity to include in the Descriptive Statistics analysis a not reliable information on outcomes related to planned, or forecasted figures.

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30 The rates of availability of data are: 21% for any incentives to any of the parties involved given during project's operation, 15% for conflicting objectives in relation to the pricing scheme and 28% on acceptability issues in relation to the funding scheme applied.

31 Reduction of travel time 38%, reduction of travel costs 31%, improvement of reliability 32% and improvement of safety 32%.

32 By adding the total percentages of data availability in the ranges 50-75 and 75-100 (see Table 6.2).

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Within the database contructed at the second level of analysis, eight case studies have been reported "under construction"[33] and one "awarded not yet started". Hence 9 out of 81, or 11%. The reliability of the outcomes is an important aspect to be considered before the implementation of the third level of analysis, where the information on the outcome variables are crossed with those on influencing varaibles.

The reliability on the information about the influencing variables is less critical. It mostly provides with a presentation on inherent features of a project that are not expected to be changed when the full operation will be achieved. On the other hand, the information related to the outcome variables is more crucial for the purpose of the Descriptive Statistics analysis.

Within the three outcome variables, the reliability of the information made available depends on the case study. The timeline can be exploited to perform this check. The state of progress of the works may provide with necessary information on actual investment costs borne and delays on time scheduled of completion of works. Transport demand should be treated more carefully. If a project is still under contruction and far from completion, the information provided is not realible and maybe concern an estimation. On the other hand, it could be considered to some extent reliable, if a project has been partially completed (e.g., opened in phases) and the context in which it operates supports the assumptions.

Table 6.3 gathers the case studies not yet operating. Amongst them, two projects do not provide with any information on the outcome variables. Such limited number of cases could not affect significantly the results of the analysis. Concerning the others, the information can be assumed reasonable in relation to the main points of interest of the timeline and hence sufficiently realiable.

Given the above, data availability can be assumed appropriate for the purpose of the Descriptive Statisctics analysis and refinements have not been introduced in the structure of the database assembled at the second level (in form of a unique spreadsheet). Besides in light of the size of the sample, further segmentations may reduce the possibility to draw lessons learned.

Eventually, another preparatory step regarded a number of intermediate elaborations to manipulate raw quantitative and qualitative inputs from the protocols. Raw data have been modified to obtain simplified indicators and categories (i.e., qualitative scales and ranges). Such preparatory elaborations have been carried out with respect to twenty-nine variables that have been listed in the Table A.2 of the Appendix. The table has been organised from left to right to present the variables: as from the protocol, the type of raw data needing manipulation, the final indicator assumed and the related categories.

[33] In the database assembled a tenth project has been reported "under construction". The check performed on the Bundesautobahn 20 highlighted that this project was completed in 2005 (see OMEGA Centre – Project Profile).

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Table 6.3: Projects of the database reported as being "under construction", or "awarded not yet started"

Project title	Variations of the outcome variables			Timeline (important dates)
	Transport demand	Investment Costs	Time schedule of completion of works	
Ionia Odos motorway	Far below	In line	Exceeded	2010: works halt/ commencement of contract renegotiations. 2013: announcement of agreement on basic renegotiation terms. EC (2013)[34] reported that themotorway suffers from reduced (actual and forecasted) revenue from its operation, which has decreased significantly its capacity to repay the commercial loans and to provide a return for the Concessionaire.
Central Greece (E65) motorway	Far below	In line	Exceeded	2008: start of construction. 2007: works halted due to a draw stop imposed by the lenders. 2013: final agreement on renegotiation terms announced and recommencement of construction works. EC (2013)[35] reported that since 2011, the motorway faced a significant decline in revenue through the reduction in traffic (at least 60% lower than envisaged), mainly due to the worsening economic conditions in Greece. The duration of the construction of the motorway was delayed by 27 months.
Elefsina Korinthos Patra Pyrgos Tsakona (Olympia Odos) motorway	Far below	n.a.	Exceeded	2010: date of works halt/commencement of contract renegotiations. 2013: date of announcement of agreement on basic renegotiation terms. EC (2013)[36] reported that since 2011, the motorway faced a significant decline in revenue through the reduction in traffic (at least 49% lower than envisaged), mainly due to the worsening economic conditions in Greece. As a result of the construction delays, including the suspension period, the duration of the construction of the motorway was delayed by 16,5 months.
Deurganckdoksluis-	n.a.	n.a.	n.a.	2011: start of building works.

[34] See European Commission, 2013, State aid SA.36893 (2013/N) – Greece – Reset of Greek Motorway concession projects – Central Motorway (E65), Brussels 13.12.2013, COM(2013) 9274 final.

[35] See European Commission, 2013, State aid SA.36893 (2013/N) – Greece – Reset of Greek Motorway concession projects – Central Motorway (E65), Brussels 13.12.2013, COM(2013) 9274 final.

[36] See European Commission, 2013, State aid SA.36878 (2013/N) – Greece – Reset of Greek Motorway concession projects – Olympia Odos S.A. Brussels, 13.12.2013, C(2013) 9253 final.

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Deurganckdock lock				2016: scheduled end of works.
Larnaca Port & Marina redevelopment	n.a.	In line	Exceeded	2010: termination of negotiations with the successful bidder. Invitation to the second preferred bidder for negotiations. 2012: financial close was to be accomplished within 6 months (date extended multiple times). 2015: last extension exhausted at the end of February, with no progress.
MXP T2-Railink-up	n.a.	In line	In line	2014: worksite delivery to the contractor. 2016: completion of work/beginning of operation.
Tram-Train Kombilösung Karlsruhe	n.a.	n.a.	In line	2010: construction works in Kaiserstrasse in four phases. 2012: begin of the second construction phase. 2013: begin of the third construction phase. 2014: begin of the fourth construction phase. 2015: start of the second partial project new tram line and car tunnel Kriegsstrasse. 2016: carcass works on underground stops are going to be terminated and technical components for all tunnel tracks and ramps are goign to be installed. 2018: Planned opening of the tram tunnel.
Berlin Brandenburg Airport	Below	n.a.	Exceeded	The construction works has been completed. The airport is set to open in the second half of 2017.
Koper - Izola Expressway	n.a.	n.a.	n.a.	Due to contractor company bankruptcy, the project is still not finished. Official opening was planned for June 2015.

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7. Descriptive Statistics analysis of BENEFIT cases database

7.1 Introduction

The analysis carried out in Chapter 7 follows the methodology described in Chapter 5. In addition, based on the findings highlighted reviewing the empirical literature, three outcome variables were identified as providing benchmark on the performance of each case. Their identification, in terms of success and failure factors should ultimately not be avoided in order to properly address conclusions.

The three **outcome variables** consider the variations of costs, transport demand and time schedule of completion of works (i.e. project's delivery) with respect to initial forecasts. As already anticipated, these variables are tentative and have been assumed as a starting point of the Descriptive Statistics analysis, on the basis of the review of the literature. Nonetheless, the perspective of the analysis could be enlarged to allow for further comparative conclusions with respect to other variables that may influence the outcomes.

As regards to the methodology presented in Chapter 5, level 1 and 2 of the analysis have been discussed at the beginning of section 5.2 referring to the preparation of the database. The present Chapter 7 implements level 3. In this final step, the three outcome variables are cross-tabulated with influencing **variables** worth being investigated and for which data availability has been deemed sufficient to perform the elaborations (see Table A.281 in the Appendix A.7). Following a short introduction to discuss on the distribution of the outcome variable under consideration, each subsection of paragraph 7.2 discusses only the cross-tabulations for which substantial findings can be presented[37]. Section 7.3 summarises the conclusions and lessons learned.

Chapter 5 anticipated that sufficient quantitative information has not been made always available across the influencing variables used. Therefore, where necessary, the quantitative categories of the protocols have been redefined according to qualitative scales, or aggregating to avoid dispersion of the observations. In order to facilitate the reader, the manipulations introduced on raw data are mentioned throughout the presentation of the cross-tabulations discussed in the next section. Other manipulations used to carry out all the cross-tabulations are listed in Appendix A.2.

Finally, it is worth noting that all the elaborations performed are based on the database made available for the purpose of this analysis, and as stated before it has some limitation due to information availability. The database on which the elaborations have been carried out is the best and largest available.

7.2 Substantial findings from the third level of analysis

The present subsection concentrates on the study of cross-tabulations on the selected outcome variables, against the influencing variables.

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[37] The cross-tabulations of which the results might be difficult to explain, or misleading for the purpose of this analysis, have been omitted in the main text and gathered in Appendix A.3.

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7.2.1 Cross-tabulations with respect to variations of costs[38]

Analysing with respect to variations of costs, the category deserving more attention refers to the outcome exceeding forecasts, as this means that costs have been underestimated.

According to the information collected, the case studies made available in this database show outcomes mostly in line with forecast (62%). Cases that exceed the budget are 24%, while the remaining can be reported below and far below cost forecast. With respect to the financing scheme, PPPs perform in general better than public ones having a lower share of cases exceeding (22% against 27%) and a higher share of those in line with forecasts (67% against 53%). The two schemes have the same number of cases with outcomes below forecast, but public cases show a higher share (see Table 7.1).

It is estimated that complexity from any source may be a factor influencing the ability to implement projects in line with forecasts.

Table 7.1: Distribution of outcomes with respect to variation of costs

Financing scheme	Absolute values (Number of cases)			Shares		
	Exceeded	**In line**	**Below and far below**	**Exceeded**	**In line**	**Below and far below**
PPP	6	18	3	22%	67%	11%
Public	4	8	3	27%	53%	20%
Total	**10**	**26**	**6**	**24%**	**62%**	**14%**

The outcome of the case studies with respect to the **type of field** (brownfield, greenfield, or both) to some extent confirm the findings highlighted in the review of the literature See tables A.3, A.4 and A.5 in Appendix.

- Brownfield cases that may approximate less complex projects perform better than greenfield ones, exceeding forecasts at a rate equal to 13%, against 55%. About cases with both fields[39], they exceed forecasts in the 16% of the observations. To some extent such distribution of outcomes may also suggest that a phased approach, instead of a totally new project, can more likely meet initial cost forecasts.

- With respect to the financing schemes, PPPs perform in general better, as 24% exceed forecasts against 31% of public projects.

- Making a distinction about the fields, greenfield cases do not perform well neither as PPP, nor as public projects, and this may highlight again an inherent complexity independent from the scheme.

The literature reports that the size of the investment could be related to the level of complexity and hence might be more incline to generate cost overruns. Nevertheless, examining the outcomes on costs and the **size of the investment**, it emerges an inverse relationship amongst these classification variables. Even distinguishing by financing scheme the pattern does not change. See tables A.9, A.10, A.11 in Appendix.

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38 Cost/budgeted of Investment (cost overruns). Section 1.8.7 Performance with respect to Project Costs.

39 Projects may include parts which are greenfield and brownfield. For example, the construction of a new motorway combines a greenfield project with a simultaneous upgrade of the existing parts (brownfield project).

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The **physical description** in terms of network might approximate the level of complexity during a project's implementation. In this view, entire links, or nodes, could be more difficult to implement and more susceptible to costs overruns, if compared to smaller parts (e.g., a terminal within a port, or a bridge). See tables A.15, A.16, A.17 in Appendix.

- In the general case, although based on a very limited number of observations (3), "node within a node" is the category that performs better, having no cases exceeding forecasts. When referring to entire nodes, 17% exceed.
- As regards "link within a link", 25% exceeds, against 29% of entire links.
- The type of financing scheme seems not influencing the finding above.

The relative better performance of "node within node" and "link within link" may be explained by the higher attention given to the construction of infrastructures having significant technical difficulties, like for example bridges, or tunnels. On the other hand, as emerged from the review of the literature (Cuttaree et al., 2009), smaller projects may inherently have a lower level of complexity and this aspect could be considered developing larger projects through a phased approach.

The analysis of the cases with respect to the **type of users** verifies the hypothesis of keeping costs more under control whether a user-specific project is implemented. See tables A.21, A.22, A.23 in Appendix.

- With respect to the available cases, the outcomes of cases designed for a mix use exceed forecasts at a rate equal to 22%. The outcomes of only passengers cases exceed forecasts at a rate equal to 33%. Making a distinction by financing scheme, the pattern does not change.

The influence of the **type of expected repayment revenues during the operating phase** has been analysed concentrating on two categories only, in which the stream of revenues is based on user charges has been compared to all the other revenue types in aggregate form[40]. See tables A.27, A.28, A.29 in Appendix.

- This analysis makes evident that cases depending only on the stream of repayment revenues generated by users charges perform better. Out of 8 cases, 1 exceeds forecasts (13%). Considering all the other forms, 29% exceed. The analysis suggests that cases based on user charges only have a sort of incentive to keep costs more under control (notably, when transport demand is the only source to repay the investment).
- The cases within PPP schemes confirm the general distribution, independently from the repayment categories. Public projects are almost entirely concentrated on cases based on other forms of repayment (11 out of 12) and as in the general result these are more incline to exceed.

In the following paragraphs the discussion of the results focuses on the **types of risk** considered in the protocol, notably with respect to their allocation between contractor and public party. To facilitate the interpretation of the cross-tabulations carried out, the three categories of allocation of risk foreseen for each party (i.e., totally, mostly and rather) have been merged into one only (aggregated). As anticipated

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[40] The aggregate category "All other forms" includes: Usage payment, Shadow tolls, Availability charge, Quality performance payment, Subventions, Secondary revenues, Mixed stream of revenues and Other streams of revenues (to be specified).

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introducing the analysis, the text presents only the description of the results that provide with substantial findings.

- **Construction**: in 90% of the cases the risk is allocated to the contractor (35 out of 39). With respect to the occurrence of the outcomes across categories, 23% of the observations exceed. In PPPs the contractor bears the risk in 26 out of 27 cases and performs similarly compared to the total distribution of the cases. Regarding the public cases, the risk is again mostly allocated to the contractor (9 out of 12 observations). Comparing the contractor to the public party, it exceeds more (33% against 0%). With respect to the outcomes of the contractor across financing schemes, one could infer that in public projects it may have a lower incentive to respect costs budget. When directly involved in a PPP project, the private sector demonstrates more capable to deal with risks, exploiting the knowledge in the industry and relative more experience in controlling over the risk factors (the World Bank, 2005(b) and EIB, 2004). On the other hand, it might be the case that the results of a higher rate of cost overruns in public projects may be related to other factors (e.g., changes of project scope, or layout). See tables A.33, A.34, A.35 in Appendix.

- **Commercial/revenue**: the contractor bears the risk in the majority of the cases (24 out of 41, or 59%). It performs better than the public party when forecasts are exceeded (21% against 29%) and in line (71% against 53%). Within PPP financing scheme, the risk is again borne mostly by the contractor (21 out of 27, or 78%) and the distribution of the outcomes nearly replicates the general result. Although the limited number of cases available to compare, in this database the public party performs slightly better than the contractor when forecasts are exceeded (17% against 24%). Regarding public cases, the party bearing the risk is mostly public (11 out of 14, or 79%). Outcomes exceed cost forecasts in 4 cases (or 36%). See tables A.42, A.43, A.44 in Appendix.

- **Financial**: in the observations available the contractor is in charge of this risk in 27 out of 36 cases (or 75%). The rate of observations that exceed forecasts coincides, being 22% for both parties. There exists a clear allocation of the risk amongst financing schemes. Within PPPs the contractor is in charge of the risk in 26 out of 27 cases (96%) and the outcome exceed forecasts at a rate equal to 22%. Regarding public cases, the public party bears the risk in 8 out of 9 (89%) cases and the outcome is symmetric (25% when forecasts are exceeded). See tables A.45, A.46, A.47 in Appendix.

7.2.2 Cross-tabulations with respect to variations of transport demand[41]

Analysing with respect to transport demand, the category deserving more attention concerns the outcomes below and far below forecasts, as this means that transport demand has been overestimated.

According to the database available, the distribution of variations of transport demand with respect to forecasts results U-shaped in the general case. The maximum of the observations is in the category below and far below forecasts (26 cases out of 64, or 41%). On the other extreme, 22 cases (or 34%) perform above forecasts. PPPs (43 cases) are below and far below forecasts in 19 observations, displaying a higher share compared to public cases (44% against 33%) that are more incline to exceed (52% against 26%) (see Table 7.2).

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[41] Actual vs traffic forecasts. Section 1.8.8 Performance with respect to Project Revenues.

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Table 7.2: Distribution of outcomes with respect to variation of transport demand

Funding scheme	Absolute values (Number of projects)			Shares		
	Exceeded	In line	Below and far below	Exceeded	In line	Below and far below
PPP	11	13	19	26%	30%	44%
Public	11	3	7	52%	14%	33%
Total	**22**	**16**	**26**	**34%**	**25%**	**41%**

The analysis of the outcome of the case studies with respect to the **type of field** (brownfield, greenfield, or both) is summarized in tables A.90, A.91 and A.92 in Appendix.

- Brownfield cases (9 out 50 cases, or 18%) perform generally better than greenfield and both, as less below and far below forecasts (11% against 29% and 29%).
- Concerning the financing schemes, in PPPs, brownfield cases below and far below forecasts are 0%, against 29% and 31% of greenfield and both, respectively. With respect to PPPs, public cases are more incline to be below forecasts exceed across all fields (17% when brownfield, 33% when greenfield and 25% when both, against 0%, 29% and 31% respectively).

As anticipated in the literature review on **transport modes** (see section 4.2.1), the projects of the road sector seems more suitable for implementation within PPP schemes (Bain, 2009). Analysing this mode against the others together[42], the following considerations emerge. See tables A.93, A.94, A.95 in Appendix.

- All in all, the database provides with 30 road cases, mostly below and far below forecasts (47%). The forecasts of all the other modes (34 cases) are more accurate (35%).
- With respect to the public cases, PPPs of road projects are slightly less below and far below forecasts (46% against 50%).
- Comparing all the other modes together, again with respect to the financing schemes, the outcomes achieved are better within public projects: the overestimation of transport demand forecast is equal to 42% for PPPsagainst 27% of public projects.

According to the review of the literature, as **size of the investment** increases, so does demand risk and large projects could be more risky (Cuttaree et al., 2009 and Cuttaree and Madri-Perrott, 2010). The analysis of the outocome of the case studies with respect to the size of the investment is summarized in tables A.96, A.97, A.98 in Appendix.

- In the total sample, the rate of cases overestimating transport demand forecasts is very high (41%). This rate is higher for PPPs (42%), against 27% of public projects.
- Considering the PPPS, the rate of cases below and far below forecasts steadily increases with the size of the project.

42 The category “others” includes: rail, seaport, inland port, inland waterways, freight terminal, airport, tramway and metro.

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- The opposite holds for public projects, in which the rate of cases below and far below forecasts is much higher for smaller projects (50% and 57%), with respect those larger (0% and 20%).

- With respect to inaccuracy, it worth noting also that 34% of the cases shows a transport demand higher than forecasts (26% for PPPs and 52% for public projects).

The **physical description** of a project could be read in terms of difficulty to provide with accurate demand forecasts when analysing entire nodes, or links, with respect to their parts (i.e., “node within node”, or “link within link”). Possibly, being implemented as part of larger operating infrastructures, uncertainties of the latter categories may be limited by the fact that historical data on traffic are available. See tables A.102, A.103, A.104 in Appendix.

- All in all, the sample available shows that “nodes within nodes” and “links within links” perform better than their entire counterparts. “Nodes within nodes” and “links within links” are less below and far below forecasts (respectively, 33% and 25%) with respect to the entire counterparts (respectively, 56% and 43%). On the other hand, nodes within nodes and links within links exceed more forecasts (respectively, 60% and 67%) with respect to entire nodes and links (respectively, 33% and 25%). This finding remains relatively unchanged within PPPs and public cases.

Analysing with respect to the **type of users**, the cases available show different outcomes for user-specific projects (i.e., passengers, or freight, only) compared to those conceived for a mix use. See Table A.105, A.106, A.107 in Appendix.

- User-specific cases exceed more, are more in line and less below and far below forecasts. Out of 36 cases in the whole sample, mix use cases show 20 observations below and far below forecasts (56%), suggesting that transport demand forecasts might be less reliable dealing with more complex projects. The outcome of mix use cases remains unchanged amongst financing schemes. With respect to cases conceived for passengers only, projects implemented within PPPs show different performances across outcomes comparing with those public. In this respect, the PPPs are more below and far below forecasts (30% against 18%) and less incline to exceed (20% against 64%).

The description of the results cross-tabulating by **locality** follows an approach by category, as some patterns can be identified. See tables A.111, A.112, A.113 in Appendix.

- In general, urban and regional cases are less incline to be below and far below forecasts (respectively, 24% and 36%), while outer urban, inter-urban and international cases are more likely to be so (respectively, 62%, 50% and 75%). Urban cases seem the category performing better, as ranking second when exceed and first when in line with forecast; this could be explained by the fact that demand density is higher in such spatial context compared to the others (e.g., due to higher population density), or given the existence of historical data on urban traffic. Urban cases perform significantly better if public, as 63% exceed, 25% is in line and 13% is below and far below forecasts.

- Outer urban, inter-urban and regional cases show comparable outcomes amongst financing schemes. All international cases are below and far below forecasts within PPPs and the only public case exceed forecasts.

Passengers transport demand could be influenced by changes of **population density** occurred in the region. In this case, one could foresee that where population density is higher than forecasts, so should be transport demand and vice versa. See tables A.114, A.115, A.116 in Appendix.

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- The pattern above is identifiable in the whole sample available. Almost half of the cases (25 out of 52) fall in the category below and far below forecasts, wherein the rate steadily increases from 37% when higher than expectations to 56% when unchanged and to 67% when lower than expected. Another steadily decreasing pattern across expectation categories emerges referring to outcomes in line with forecasts, namely from 33%, to 13% and to 0% moving from higher to lower than expected.

- PPPs replicate the general pattern when the outcome is in line (from 40%, to 10% and to 0%), but only partially when below and far below forecasts. Although the conclusion is based on a limited number of observations, public cases confirm the pattern of the general sample in the category below and far below forecasts (from 14%, to 50% and to 100%) and another pattern emerges referring to outcomes that exceed, where the rate steadily decreases (from 71%, to 33% and to 0%).

The type of expected repayment revenues during the operating phase may influence the outcomes on transport demand, notably concerning user-charged projects. In this perspective, the categories of the protocols not directly perceived by the users have been aggregated into one only (i.e., all other forms) and compared with the previous. See tables A.120, A.121, A.122 in Appendix.

- Out of 54 cases available for the purpose of this analysis, 10 refer to user-charged projects (all are PPPs), of which 50% are below and far below forecasts. The share of cases in the same category, if all other forms of payment are considered is lower (41%, of 44). To some extent this finding shows that transport demand might be more sensitive to a user-charged project and hence that accuracy of forecast is an important aspect.

- As regards public cases all observations fall in the category "all other forms" and these perform below and far below forecasts at a similar rate compared to PPPs (respectively, 42% and 41%).

The following paragraphs focus the attention on the allocation of **risks**. As discussed in section 7.2.1, the three categories considered about risk allocation for each party (i.e., totally, mostly and rather) have been merged into one only (aggregated). The text below presents only the description of the results that provide with substantial findings on the relationship between types of risk and variations of transport demand.

- **Construction**: the party who bears this risk is mainly the contractor (47 out of 53, or 89%) and amongst outcome categories, the maximum is reached for cases below and far below forecast (20, or 43%). If the risk is borne by the public party, the rate of cases that are below and far below decreases to 17% (over a total of 6 cases). As regards PPP cases (40), in 38 the contractor is in charge of the risk and there is not a significant difference, with respect to the general distribution. In public cases, the risk is again mostly borne by the contractor (9 out of 13) and cases perform below and far below forecasts in 44% of the cases available. In the remaining 4 cases, the risk is are allocated to the public party and always exceed forecasts. According to the review of the literature, when the construction risk is transferred to the contractor (i.e., private sector partner), it prices the risk. If this is the case, costs are expected to be higher and therefore so will the charges the users pay. If users' WTP is not properly appraised, demand could end below forecasts. See tables A.132, A.133, A.134 in Appendix.

- **Maintenance**: the distribution of the observations shows that this risk is mostly allocated to the contractor (46 cases out of 54, or 85%) and when this is the case, the maximum is reached when the outcome is below and far below forecasts (19 cases, or 41%). If the risk is borne by the public party the rate of cases below and far below is similar (38%). In all PPPs (41), the contractor is in charge of the risk and there is not a significant difference across outcome categories, with respect to the general distribution. Regarding public cases, the risk is mostly borne by the public party (8 out of

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13 cases). Within this scheme, the outcome is below and far below forecasts, either the contractor, or the public party, bears the risk and respectively in 20% and 38% of the observations. See tables A.135, A.136, A.137 in Appendix.

- **Commercial/revenue**: in more than half of the observations the party who bears the risk is the contractor (33 out of 60, or 55%) and the outcome is mostly below and far below forecast (15 out of 33, or 45%). The outcomes of the public party are more evenly distributed across categories, but again more incline to be below and far below forecasts (10 out of 27, or 37%). Concerning PPPs (43 observations), when the contractor is in charge of the risk (31 cases, or 72%), there is no significant difference across outcome categories comparing with respect to the general case and nearly half of the cases is below and far below forecast (48%). Referring to public cases, the risk is mostly borne by the public party (15 out of 17 cases, or 88%) and the observations are concentrated at the two extremes of the outcomes, with 6 observations in each (or 40%). See tables A.141, A.142, A.143 in Appendix.

- **Financial**: in the 74% of the observations available for this analysis (50 in total), the contractor bears the risk and amongst the outcomes it is mostly below and far below forecasts (16 cases, or 43%). On the other hand, if the risk is borne by the public party the distribution across categories shows a lower rate at the category below and far below forecasts (3 out of 13, or 23%). With respect to the financing schmes, PPPs 37 out of 40 PPPs (or 93%) are in charge of the contractor and the distribution across outcome categories replicates that of the general case. With respect to public cases (10), the risk is always borne by the public party and the cases below and far below forecasts are 20% of the observations. See tables A.144, A.145, A.146 in Appendix.

7.2.3 Cross-tabulations with respect to variations of time schedule of completion of works[43]

As remarked dealing with the analysis on the variation of costs, also in this case, the category deserving more attention refers to the outcome exceeding forecasts, as this means that time delivery has been underestimated.

Amongst 45 cases of which the outcome on the completion of works has been made available, 31% exceed delivery time, 64% are in line with forecasts and only 4% are below and far below forecasts. With respect to the financing schemes, PPPs nearly replicate the general distribution, while public projects show a higher rate of cases exceeding forecasts (see Table 7.3).

Table 7.3: Distribution of outcomes with respect to variation of time schedule of completion of works

Funding scheme	Absolute values (Number of projects)			Shares		
	Exceeded	In line	Below and far below	Exceeded	In line	Below and far below
PPP	8	20	2	27%	67%	7%
Public	6	9	0	40%	60%	0%
Total	**14**	**29**	**2**	**31%**	**64%**	**4%**

43 Delay in completion of works/opening of operation. Section 1.8.7 Performance with respect to Project Costs.

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As suggested by the literature review and anticipated in the analysis crossing the **type of field** (greenfield, brownfiled or both) with deviations from investment cost forecasts, greenfield projects could feature a higher level of complexity for implementation (e.g., due to technical uncertainties and non-standard contruction) and hence be more incline also to construction delays. See tables A.162, A.163, A.164 in Appendix.

- In the database available, this hypothesis is confirmed for PPPs only. They show a rate of cases exceeding forecasts lower than the public ones (27 against 40%)
- As regards brownfield cases, PPPs are always in line with forecasts (100%, of 3 cases), while public cases mostly exceed (4 out of 5, or 80%).
- Referring to greenfield cases, PPPs exceed at a lower rate compared with those public (21% against 33%).
- Considering cases including both greenfield and brownfield parts, public cases show better outcomes. The share of cases exceeding forecasts is lower (14% against 38%).
- All in all, the greenfield projects show 4 cases (out of 17) exceeding forecasts (24%). Brownfield cases account for 8 cases, of which half exceed forecasts. Cases with both fields exceed forecasts in 6 cases (or 30%).

Analysing cases by **transport mode**, it emerges that the outcomes of the road sector are relatively close to those of the others with respect to the category exceeding forecasts (29% against 33%) . This results occurs also within both financing schemes (in PPPs 25% of the road mode against 29% of the others and in public projects 40% for both). See tables A.165, A.166, A.167 in Appendix.

In relation to the findings of the literature review, the **size of the investment** (i.e., the potential proxy of the level of complexity) might influence the implementation phase of a transport infrastructure. See tables A.168, A.169, A.170 in Appendix.

- To some extent, the cases suggest that there exists an inverse relationship between the outcome and the size of the investment, but the patterns are not straightforward.

The categories related to the **physical description** of a project might be an approximation of the level of complexity. In this regard, part of nodes or links should perform better than entire structures of the same category. This assumption seems confirmed, as results from the whole sample available for this analysis. See tables A.174, A.175, A.176 in Appendix.

- Considering the “nodes within nodes”, thay exceed at a lower rate (33% against 56%). Similarly behave the observations on “links within links” (e.g., bridges). This might be due to the fact that a special infrastructure is addressed with detailed planning requirements enabling the achievement of the scheduled time completion.
- Making the distinction amongst financing schemes the outcome is more articulated. Considering the nodes, PPPs perform better in case of entire structures, compared to their parts in both exceeding (20% against 33%) and in line with forecasts (80% against 67%). Again within PPPs, part of links show better outcomes against entire counterparts. Eventually, public links show better outcomes compared to PPPs, as exceeding forecasts at a lower rate (20% against 35%) and being in line at a higher rate (80% against 59%).

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As anticipated cross-tabulating with respect to cost deviations, the analysis of the cases with respect to the **type of users** can be read as the possibility to keep also the implementation schedule more under control when a user-specific project is implemented.

- In general, time delivery emerges more accurate for cases conceived to serve specific categories of users, instead of those mixed. Both categories specialised for passengers and freight show lower rates in exceeding. See tables A.180, A.181, A.182 in Appendix.

With respect to the **locality** different patterns can be discussed. Urban, outer urban and regional cases perform in general better than the average of the whole sample, showing lower rates in exceeding forecasts and higher in being in line. With respect to the urban and inter-urban categories, public cases perform better than PPPs. The opposite can be observed about outer urban, regional and international cases. See tables A.183, A.184, A.185 in Appendix.

The influence of the **type of expected repayment revenues during the operating phase** on delivery schedule is the same as the finding obtained in the analysis about cost variations. The cases depending only on the flow of revenues generated by users perform better than those repaid with other forms. In the whole sample available, this occurs across all outcome categories. Hence, there exists a sort of incentive also to keep implementation schedule more under control, when a project depends on user charges. This point also emerged from the literature review referring to the vicious cycle that a delay could trigger (i.e., the "debt trap", see Flyvberg, 2014). PPP schemes confirm such finding for cases depending on user charges. With respect to cases with revenues based on other forms, there is not a significant distinction amongst categories and financing schemes. See tables A.186, A.187, A.188 in Appendix.

The paragraphs below focus on the analysis of the outcomes in respect to **risk allocation**. describing only the results that provide with intuitions on the relationship between types of risk and variations of time schedule of completion of works.

- **Construction**: in 90% of the cases the risk is allocated to the contractor (35 out of 39). With respect to the occurrence across outcome categories, 31% exceed forecasts when the contractor is in charge of the risk. With respect to the remaining 4 cases allocated to the public party, 25%. Similar to the general sample, is the distribution within PPPs. Regarding public ones, the risk is allocated to the contractor in the majority of the observations available (73%). Amongst them, 38% exceed time delivery forecasts. See tables A.195, A.196, A.197 in Appendix.

- **Maintenance**: the preferred party for the allocation of this risk is the contractor, in 31 out of 39 cases (79%). In general, across outcome categories, cases exceed forecast at a rate equal to 29% when the risk is allocated to the contractor and 38% when allocated to the public party. Within PPPs, in all the cases, this risk is allocated to the contractor, with a distribution across categories almost identical with respect to the whole sample. Regarding public cases, the party bearing the risk is mostly the public (73%) and outcomes across parties are approximately the same. See tables A.198, A.199, A.200 in Appendix.

  Commercial/revenue: the contractor is the party that bears the risk in the majority of the cases (59%). In general, there is not a significant difference amongst parties across outcome categories. Within PPP, the contractor in 24 out of 30 cases (or 80%) and it exceed forecasts at a higher rate compared to the public party (29% against 17%). As regards public cases, the public party bears the risk in 12 out of 14 cases (or 86%) and it exceed forecasts at a lower rate compared to the contractor (42% against 50%). See tables A.204, A.205, A.206 in Appendix.

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Financial: in the cases available the contractor is in charge of this risk in 27 out of 36 cases (or 75%). The public party exceedes forecasts at a lower rate compared to the contractor (22% against 33%). Within PPPs the risk is borne by the contractor in almost all the cases and the distribution its outcomes nearly replicates that of the general result. In the remaining two cases in charge of the public party, the outcome is always in line. Regarding public projects, the party bearing the risk is the public in almost all the observations (7 out of 8). The outcomes exceed delivery forecasts in 3 cases (38%). See tables A.207, A.208, A.209 in Appendix.

7.3 Conclusions and Lessons learned from the Descriptive Statistics analysis

The previous section presented and discussed the results of the cross-tabulations carried out to investigate on the influencing variables with respect to the outcomes of the case studies. Using the three outcome variables - variations of cost, transport demand and delivery time - as a starting point, the analysis at the third level of analysis assessed the outcome with respect to a single influencing variable[44].

The purpose of the Descriptive Statistics analysis is to derive comparative conclusions regarding the role of the influencing variables, according to the perspective used. The findings obtained are based on the database assembled, which is by no means perfect, but is the best and largest available.

From the starting point assumed, the **level of complexity** of a project is a variable that emerges as deserving attention. The role complexity plays has been analysed through different influencing variables, including **type of field**[45] (green, brown and both), **physical description**[46] (node and link) and the **size of the investment** (in ranges per value of the investment). These seem partially to provide with findings in accordance with the review of the literature.

The distribution of outcomes suggests that a brownfield cases, instead of a totally new ones (greenfield), could be more beneficial in order to meet initial costs and demand forecasts. The risk of deviations implementing for example non-standard technologies could be reduced. Besides, this could also be explained by the availability of historical data on construction and traffic. The case studies examined seem not confirming the hypothesis that small projects are less likely to exceed costs forecasts with respect to those larger.

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44 A further level of analysis is presented in Appendix A.4 (i.e., the fourth level). This attempt was aimed to investigate to what extent an influencing variable might affect the three outcomes simultaneously.

45 To substantiate the analysis on the level of complexity, further considerations have been drawn eliciting from the information available. Firstly and according to the descriptions provided in Appendix A.7, amongst greenfield cases, eight only have been developed in phases. As the majority have been implemented in one phase only, this may suggest and higher level of complexity for this category. Secondly, costs of the cases have been reconsidered aggregating into two categories, with a size threshold placed at 500 million Euro. In doing so, 69% of brownfield are below such threshold, 55% of greenfield are higher and 61% with both fields are higher. This may suggest that the database available has more projects “small” and brown (i.e., low complexity) than “big” and green (i.e., higher complexity).

46 According to the results obtained cross-tabulating between outcomes and physical description, cost overruns are less likely for part of nodes, or part of links (i.e., small and less complex projects). As regards time overruns entire nodes, or links (i.e., big and more complex projects) are more incline to exceed, while part of nodes, or links, are more in line with forecasts.

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Reading across the financing schemes, PPPs perform more in line and public cases more exceeding outcome forecasts. This suggests that PPPs are less likely to underestimate costs and delivery time and public projects are more incline to underestimate transport demand.

The analysis on the physical description suggestes that cases within nodes and links are less susceptible to cost overruns and delays and more consistent with demand forecasts. Projects like bridges and tunnels, usually having technical difficulties might be designed with more attention (e.g., in relation to the workplan of construction activities), to avoid cost and time overruns. In this dimension, there is not a significant difference amongst financing schemes[47].

From the findings above, it could be inferred that projects featuring a low level of could be more likely to show outcomes that materialise according to forecasts. With respect to the financing schemes, PPPs seem to meet targets.

The **specialisation** of infrastructure, in terms of **type of users**, is a second feature that provides interesting findings. According to the categories the analyses have been undertaken, user-specific cases are compared to those conceived for mix use.

The analysis showed that user-specific cases are more likely to perform better than those for mix use when referring to transport demand and time delivery forecasts. As regards transport demand, user-specific cases "exceed" more, are more "in line" and less "below" and "far below" forecasts. Similarly, time delivery forecasts are more accurate for user-specific projects, compared to those for mixed traffic[48].

Comparing amongst user-specific modes, freight cases perform better than those conceived for passengers only, again in terms of accuracy of transport demand and time delivery forecats. Although this consideration is based on a restricted number of observations, freight-specific projects seem more likely to perform generally better. According to the review of the literature, such behaviour could be explained by the ease with which operations of freight specific projects could be kept separated from other expensive items (e.g., items of infrastructure)[49].

The findings above suggest that projects designed for user-specific purposes might be more likely to be compliant with forecasts. Such characteristic could be related also with the previous remark on complexity. Following the same path of analysis, projects seem to perform better when boundaries are well delineated on spatial[50], technical (in relation to complexity) and modal (in terms of specialisation) aspects. This second finding leads also to the conclusion that particular typologies of projects should not be preferred, or avoided, *a priori*. Complexity and specialisation are characteristics that could provide guidance in designing a project at a general level.

A third aspect worth mentioning is the influence of the **type of expected repayment revenues during the operating phase.** The analysis carried out highlighted that cases depending only on user charges perform

47 The further level of analysis presented in Appendix A.4 confirmed the influence of this variable.

48 The further analysis presented in Appendix A.4 confirmed that user-specific projects perform better across all outcome categories.

49 Possibly also being placed in an exlusive position in the network. Nevertheless, such assumption is not verified in this database. User-specific cases (adding both passengers and freight) are reported in aggregate exclusive environment in 59% of the observations. Mix use cases are in aggregate exclusive in 69%.

50 With respect to the spatial dimension, the influencing variable on project locality provides with some additional hints. Both outcome variables on transport demand and delay in completion of works show distributions of cases performing better in urban and regional environments. Notably, urban projects may benefit from a higher rate of generated transport demand, given the higher population density.

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generally better. When compared to public cases, one could infer that projects with user charges may have an incentive to keep costs and implementation schedule more under control (e.g., to avoid "debt trap"). Besides, the accuracy of transport demand forecasts (i.e., users' WTP) is particularly important for projects using user charges, as deviations may impact on revenues foreseen[51].

Concerning the finding above, one might wonder to what extent it is influenced by the distribution of the cases amongst transport modes. In this respect, section 6.2 anticipated that 43% of the cases are classified as roads, which are usually charged. To analyse on the influence across transport modes, the distribution of cases has been cross checked with the categories of the type of expected repayment revenues during the operating phase (i.e., user charges and all other forms). The distribution of obtained is almost identical[52], showing 15 roads and 16 cases when all other modes are in aggregate form[53]. Therefore the finding seems not biased by the relative majority of road cases in the database.

The review of the literature emphasized that **addressing risks** in a suitable way is very important to manage uncertainties and complexities. In this view, risk allocation is a relevant topic and each risk should be allocated to the party that is more able to bear it (see section 4.2.3). Among the categories of risks analysed, two seem more suitable to draw conclusions, namely those on construction and commercial/revenues.

In the database available, the **construction risk** is reported mostly in charge of the contractor. Comparing with the few cases wherein construction risk is reported being allocated to the public sector, the database available shows that the contractor is less incline to be in line and below forecasts of investment costs. Regarding transport demand this party is more incline to be below forecasts, while concerning time delivery is more likely to exceed and less in line[54].

According to the literature review (the World Bank, 2005(b)), if the design, construction, time schedule and operation risk are transferred to the private sector, the bundling of project phases would encourage the contractor to think about the implications of its actions throughout different stages and thus favours a whole-life costing approach. For example, if the contractor is a private agent, it could price the construction risk to compensate the perceived risk profile (e.g., due to complexities of and uncertainties of construction techniques), assuming that costs will be covered during the operating phase (e.g., exploiting lower maintenance costs). Nevertheless, the information from the cases analysed is not sufficient to verify this statement, as it allows only for a comparison between forecasts and actual outcomes. This is an important limitation on this aspect of the analysis.

Concerning the **commercial/revenue risk,** the distribution of the observations shows that considering investment cost deviations, the contractor exceeds less compared to the public party. On the other hand, with respect to transport demand deviations, the contractor performs below and far below forecasts at a higher rate compared to the public party. According to the review of the literature, this result might be explained possibly because of higher charges levied to the users to achieve cost-coverage.

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[51] The further level of analysis in Appendix A.4 shows a better overall OI when projects use user charges.

[52] For sake of robustness of the result, the content of the database in relation to the type of expected repayment revenues has been checked and refined. The category "user charge" has been assigned also in cases where initially shown as "mixed stream of revenues". This has been done where the narrative text provided in the protocols allowed to infer that the majority of the repayment revenues could be attributed to user charges.

[53] Similarly, when all other forms of repayment are considered, the distribution obtained shows 17 roads and 20 cases aggregating all other modes.

[54] The further level of analysis in Appendix A.4 to some extents confirms such finding. If the risk is allocated to the contractor, the overall OI is mostly negative. Although the number of cases is very limited to provide with sound conclusions, the overall OI improves if the public is the party in charge of bearing this risk.

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This finding again highlights the importance of accuracy on the estimation of users' WTP and transport demand for projects that are repaied through user charges[55]. Therefore, attention should be given to allocate the appropriate level of commercial/revenue risk to the contractor to avoid that project's costs, or high charges could undermine the potential benefits[56]. In particular, when investment costs must be entirely covered by user charges, a different allocation of costs between private and public parties could help lower the charges levied to the users.

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55 To some extent this is also emerges considering the distribution of the outcomes of transport demand in relation to the allocation of the financial risk. In the general case, the distribution of the observations shows that the public party is more likely to exceed and less likely to be below and far below forecasts. Besides, with respect to the outcomes on time delivery, the public party performs generally better across outcomes' categories, also independently from the financing scheme. The analysis with respect to the variation of costs does not provide with clear insights.

56 When user charges are the only source of repayment the outcome of transport demand is below, or far below forecasts, in 50% of the observations available.

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8. Funding sources and issues

The purpose of this analysis is to give an overview on the quantitative structure on funding schemes (8.1) and a qualitative discussion on their effects on the outcomes, like for example revenue risks, or incentives (8.2). It should not be read strictly in relationship with the Descriptive Statistics analysis, but rather linked with the previous and future work in BENEFIT.

8.1 Quantitative overview of funding schemes

This section provides an overview of the application of these income streams in the BENEFIT case studies.

The following remuneration schemes are identified in the case study templates:

- User charges;
- Usage payment;
- Availability charge;
- Quality performance payments;
- Secondary revenues Assets promotion, Sub-concessions, Royalties;
- Subventions;
- Other streams of revenues.

The following observations regarding the distribution of income schemes to the operator of the infrastructure may be made.

- The application of user charges or usage payments is by far the most applied source of income (Table 8.1). The 70% of the projects receive income from at least one of these sources. This is the case both for private and publicly financed projects (Table 8.2);
- The projects where user or usage charges are not being applied for remuneration correspond to road and rail projects, with the exception of one airport (Table 8.3);
- Availability charges and quality performance payments are applied in 26% of private cases. Only in 2 cases are they applied in publicly financed projects (Table 8.2);
- Availability charges and quality performance payments are entirely applied in road or rail projects, as a replacement or complementarily to payments from user or usage charges (Table 8.3).

Table 8.1: Types of income stream

User charges	Usage payment	Availability charge	Quality performance payments	Secondary revenues	Other streams of revenues	Subventions	Total
54	8	17	8	13	18	14	**82**

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66%	10%	21%	10%	16%	22%	17%	

Table 8.2: Types of income stream per type of financing (PPP or public)

Financing scheme	User charges	Usage payment	Availability charge	Quality performance payments	Secondary revenues	Subventions	Other streams of revenues	Total cases
PPP	38	5	15	8	13	10	7	58
	66%	9%	26%	14%	22%	17%	12%	
public	16	3	2	0	0	4	11	24
	67%	13%	8%	0%	0%	17%	46%	

Table 8.3: Types of income stream per transport mode

	Road	Rail	Seaport	Airport	Metro or tramway	Bicycle
User or usage charges	82%	63%	100%	80%	92%	100%
Availability or quality payments	33%	38%	0%	0%	8%	0%
Secondary revenues	24%	25%	33%	0%	0%	50%
Subventions	9%	25%	11%	20%	0%	0%
Other streams of revenues	18%	25%	0%	0%	75%	0%
sample	33	8	9	5	12	2

It is interesting to know which potentially alternative funding schemes are being applied under "Other streams of revenues". Besides shadow tolls and common revenue enhancement measures like advertisement and land use rents from bundled services, it is relevant to register three cases of earmarking of revenues from external sources (Table 8.4). None of them apply the value capture approach.

Table 8.4: Other revenues

Other income	Number of cases
Shadow tolls	3
Concession fees	1
Advertising	4
Earmarking from other transport infrastructure	1
Earmarking fuel tax	1
Earmarking from parking penalties	1
Land use rents	3

Further cross-tabulations were done between the types of income stream and project characteristics for which there is available information, particularly the type of infrastructure with respect to previous existence of an infrastructure (greenfield or brownfield) and exclusivity of the infrastructure in relation to potential competitors. The following observations are made:

- There is no clear prevalence of user pricing as an income source in relation to type of infrastructure. Brownfield and Greenfield projects show similar rates of application of pricing remuneration (Table 8.5);

- The available exclusively brownfield projects show no cases of application of subventions or other revenues (Table 8.5);

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- No significant variations across types of income stream are observed per level of exclusivity (Table 8.6);

The later observation is somewhat surprising considering that theoretically some remuneration schemes are more appropriate than others depending on the level of exclusivity of the infrastructure. In particular, the following hypotheses could be expected[57]:

- that user pricing would be rather applicable in the context of a competitive environment;

- that availability and performance payments are rather needed in the context of exclusivity.

These hypotheses cannot be confirmed with the existing data.

Table 8.5: Other revenues

	Greenfield	Brownfield	Both
User or usage charges	85%	80%	82%
Availability or quality payments	15%	30%	30%
Secondary revenues	12%	10%	27%
Subventions	8%	0%	12%
Other streams of revenues	15%	0%	30%
sample	26	10	33

Table 8.6: Types of income stream per level of exclusivity

	Competitive environment	Not exclusive	Quite not exclusive	Somewhat exclusive	Rather Exclusive	Exclusive	*index*	*differential*
User or usage charges	13	3	10	8	20	3	*0,0*	*0,2*
Availability or quality payments	3	0	4	5	2	3	*-0,3*	*0,0*
Secondary revenues	1	0	4	0	7	1	*-0,8*	*-0,5*
Subventions	1	0	3	0	1	1	*0,2*	*0,4*
Other streams of revenues	2	1	2	2	6	1	*-0,5*	*-0,2*
Full sample	14	3	11	11	23	7	*-0,3*	

Legend: *Index* is given by the average of the cases in scores that go from 3 (Competitive environment) to -3 (Exclusive). The *differential* is the difference between each index and *index* of the full sample.

The funding agents are the agents that provide the funding for the infrastructure. It was possible to obtain that type of data from a relevant set of cases. The following observations can be made based on the existing data:

- As a whole, there is a prevalence of end user funding, while public funding is also very common (Table 8.7);

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57 See Deliverable D3.1.

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- It is clear that public funding is prevalent in road and rail projects (including metro and tramway) (Table 8.8).

Table 8.7: Funding agents

EU	National	Regional /city	Operators	Passengers (End users)	Cargo owners (End users)	Consumers (of bundled commercial activities)	Other (Other entities getting value from the infrastructure)	*sample*
3	18	10	7	27	10	6	7	*44*
7%	*41%*	*23%*	*16%*	*61%*	*23%*	*14%*	*16%*	

Table 8.8: Funding agents per transport mode

	Road	Rail	Seaport	Airport	Metro or Tramway	Bicycle
EU	4%	0%	0%	0%	43%	0%
National	40%	67%	20%	0%	86%	0%
Regional /city	12%	0%	0%	0%	86%	50%
Operators that use the infrastructure	4%	33%	20%	50%	57%	0%
Passengers (End users)	68%	67%	20%	100%	71%	100%
Cargo owners (End users)	24%	33%	60%	50%	0%	0%
Consumers (of bundled commercial activities)	12%	0%	20%	50%	14%	0%
Other entities which get value from the infrastructure	12%	0%	40%	50%	0%	50%
Sample	25	3	5	2	7	2

8.2 Effects of funding schemes on internal and external outcomes

8.2.1 Introduction

Deliverable 2.2 of BENEFIT identified and reviewed a number of issues related to the availability, characteristics and effects of funding sources that are relevant to the assessment of a project's viability and economic, social and environmental performance. At the same time, the BENEFIT cases studies revealed some situations where these issues were identified as relevant in the process surrounding the project and the assessment of its outcomes.

This section provides a qualitative review of the cases where these aspects were identified as relevant in the case studies. The objectives of this work are to:

- Validate the relevance of the funding scheme issues identified;

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- Enlarging the pool of examples on the manifestation of these issues;

- Scanning further hypotheses to test in the coming stages of BENEFIT.

The review focuses on issues identified in Deliverable 2.2: Revenue Risk; Incentives; Allocative Efficiency (including internalization of costs and the marginal costs of funding); and Acceptability/Equity. The possible identification of these issues in each case by the author was spontaneous, i.e. the authors only referred to the issues whenever they found it to be a particularly relevant in the history of the project. The review refers to all cases where each of the covered issues was identified by the authors as relevant.

In addition to these the issues above, the review also provides insights obtained in the scope of the issue of value capturing and its potential contribution for cost recovery.

8.2.2 Revenue Risk

The analysis performed in Deliverable 2.2 identified several relevant aspects concerning the performance factors affecting revenue risk.

The first refers to the cases where revenues depend on infrastructure use, creating a risk of revenue that derives from demand risk. It was noted that this risk is particularly relevant when a systematic overestimation of the future level and composition of traffic volumes occurs, the so called “optimism bias”. Overall, the optimism bias seems to prevail slightly, since out of 64 cases with data, 26 (41%) show traffic below and far below forecasts, against 22 cases (34%) where traffic exceeded forecasts. The qualitative analysis provided by the case studies show a few examples where traffic below forecasts has been identified as a failure factor. This is the case in the cases of the Radial 2 and M-12 Motorways in Spain, the Port of Sines Terminal XXI and A23 motorway in Portugal, the Herrentunnel Labeck in Germany or the Modlin Regional Airport in Poland. In the cases of Port of Leixões (Portugal) and the Herrentunnel Labeck (Germany), the traffic demand below the forecasts was identified as a reason for contract renegotiation.

As an opposite example, the Attiki Odos (Athens Ring Road, Greece) presented a traffic above expectatios. It was built as a closed, flat rate motorway around Athens Metropolitan Area, with the aim of reducing congestion by avoiding pass-through traffic and to provide access to the new airport. In the first years of operation traffic substantially exceeded forecasts, regardless of the application of the highest toll rates contractually foreseen. In recent years, due to the severe economic crisis the observed traffic went bellow initial forecasts, but still maintaining the projects PPP profitability, even after 6 years of recession. In the case of the Istrian Y project (Croatia). the traffic far exceedling forecasts is quoted as the main reason for contract renegotiation.

A second aspect identified refers to the issue of pricing. As revenues depend on the pricing level, if there is some uncertainty regarding the future price level, this contributes to additional revenue risk. Price level uncertainty may be caused by general pricing policy changes, regulatory practice based on regulatory goals or even by changes in direct taxation like VAT. On the other hand, if the Agent has power over the price level, it may partly reduce the revenue risk by adapting the pricing to any demand fluctuations. The review of the BENEFIT case studies seems to provide support to some of these aspects.

For example, the situation in Attiki Odos (Athens Ring Road) is a reflection of the perception that if the Agent has power over the price level, it may partly reduce the revenue risk by adapting the pricing to any demand fluctuations. Because real traffic level was for the first years of operation well above estimates the highest toll rates foreseen in the contract were applied. This led to higher revenues and increased ability to achieve the project objectives (i.e. reduce congestion) while contributing to sustaining the projects profitability in subsequent years, when the crisis have been hitting demand. This case also provides an example of a toll

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increase by 10€ cents, in 2010, due to changes in VAT rules. In opposition, in the case of the Moreas Motorway, also in Greece, tolls were substantially increased in 2014 with the aim of tackling the revenue gap generated by lower demand due to the economic crisis. However, the result was a negative impact in both traffic and revenues which ultimately led to a toll price reduction in January 2015.

In the UK, the BNRR (M6) provides an example of a situation in which lower demand, induced by the economic crisis, combined with the operators' ability to increase tolls led to a substantial increase in toll levels. While this allowed the level of revenues to fall less than demand it affected acceptability and the overall perception of project success.

The Ionia – Odos Motorway (Greece) provides an example where the funding of a new motorway by brownfield sections of an existing motorway led to revenue risk becoming construction risk. The economic crisis led to traffic reduction in both greenfield and brownfield sections which was then followed by a severe increase in the toll price. which increased the acceptability problems of the project, especially in brownfield sections of the project. A very similar situation was also observed in the Elefsina Korinthos Patra Pyrgos Tsakona Motorway, also in Greece. In the case of the Vasco da Gama bridge in Portugal, the lack of acceptability of the proposed brownfield charge to cover costs of the greenfield project also resulted in a need to revise the pricing regime for political reasons.

The case studies also show a very specific situation occurring regarding pricing policy in some airports. Usually airport revenues come from two separate streams: the aeronautical revenues, which are related with airport charges and fees, being regulated to allow only for recovering on expenses incurred; and the non-aeronautical revenues, such as parking fees or commercial space rentals, which are usually non-regulated (i.e. free market). This should allow airports some flexibility in optimising their revenues against their costs and demand levels, while it shall, in principle, avoid them benefiting from their monopolistic position in the provision of airport services (where demand is rather inelastic). This situation has been observed by BENEFIT in its Athens International Airport case study.

Finally, Deliverable 2.2 pointed out that other main sources of revenue also have risks. In the case of revenues from the public budget or earmarked revenues, the risk assessment by the private party will be influenced by the credit rating of the public party in question. The public party tends to be more risk neutral than private investors, but the increasing public budget restrictions have been probably increasing its risk aversion.

This may be the situation to occur in the M-45 project in Spain. This was built as a free to use motorway, which seems to deliver high benefits for the region. However, a lack of financial planning by the local transport department suggests that the payments of this infrastructure may consume about all of its resources, creating an unsustainable situation.

In the case of Metro do Porto in Portugal the relatively high success of the project was recently put at stake due to changes in the Portuguese's State credit conditions that affected the consortiums' debt structure with an impact on its profitability, financial and organizational autonomy. A similar situation occurred with "Estradas de Portugal" the public company responsible for both brownfield and greenfield road projects in Portugal. Being highly dependent on transfers from the State Budget, the project had to experience substantial changes, including the introduction of tolls in numerous shadow-toll motorways, in order to reduce the State expenditure with the road network.

8.2.3 Incentives

Deliverable 2.2 identified several relevant questions relating to the issue of incentives. Revenue streams induce incentives to the operating agent, which may influence its performance. This is particularly the case when revenues come from infrastructure pricing, featuring a potentially positive incentive to attract more

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demand through a high level of service, and a potentially negative incentive for pricing monopolistic behaviour if price is not regulated. To deal with and optimize incentive effects, the payments to the agent may be done through specific rules (related to performance indicators) complementarily or in replacement for pricing-based revenues.

The review of case studies shows that in some cases contracts explicitly include direct instruments to align the interests of the operators with the project objectives. This has been the case for example in the E39 Orkdalsvegen Public Road and the E18 Grimstad – Kristiansand in Norway where safety aspects where included as incentives in the contract. In the cases of the Attiki Odos (Athens Ring Road) and the A23 – Beira Interior Motorway (Portugal) the concessionaires were incentivised to provide a quality service and infrastructure because its revenues were depending on traffic levels.

An interesting case in what concerns incentives lies in the concessions for seaport terminals. In many cases the private operator is responsible for longer-term investments such as the upgrading and expansion of terminals, or are even given the right to build new piers. This is the case of Piraeus container terminal in Greece. By having these contractual provisions the operator has an incentive to match its offer to market needs, rather than providing capacity or services as specified by contract. In addition, the Piraeus container terminal contract includes provisions for sharing the operator's upside with the State if it exceeds a certain level (in this case if IRR is higher than 16%), creating an explicit incentive for the operator to invest in improved infrastructure and services (which in turn benefit the regional economy) rather than turning the investment in a "cash-cow". On the opposite side, a similar flexibility has allowed PSA – the operator of the Port of Sines Terminal XXI in Portugal – to postpone investments, as demand is growing below the expectations. While this has resulted in lower income for the State in terms of concession fees it allows the private partner to invest gradually, lowering financial costs.

8.2.4 Allocative Efficiency

As explored in Deliverable 2.2 the issue of allocative efficiency refers to an optimum use of the available infrastructure. According to economic theory, allocative efficiency is achieved when the users pay a price that corresponds to the marginal costs of their use. Deviations from marginal cost pricing, for example through prices based on the user-pays principle, which exceed the optimal price, translate into economic losses in the form of consumer surplus reduction. Losses of this kind take place for example when some users prefer to use poorer roads with free access to avoid paying high tolls of parallel motorways. In this case, the optimal economic return would occur if they used the best infrastructure. Allocative efficiency through correct pricing becomes particularly difficult to implement when there are several concurrent infrastructures with a different pricing policy, as a first-best pricing policy in a given infrastructure only generates efficient outcomes if the concurrent infrastructures in the network also feature marginal cost pricing. Furthermore, there are various institutional and project performance variables which are antagonous to or constrain the applicability of firs-best or even second-best social marginal cost pricing, making it respectively undesirable or even impossible to comply with allocative efficiency. In this setup, the optimal outcome is one that appropriately balances the costs and benefits of the different possible pricing systems. This review presents examples where the costs of allocative inefficiency became an issue.

The review of the BENEFIT case studies provides various examples of issues related with allocative efficiency in the road sector. The Ionia – Odos Motorway (Greece) is an example of severe traffic deviation problems. The increase in toll prices by 60% within the recession period cause diversion of both passenger and HGV traffic to local, non-tolled road links, thus causing considerable safety issues and adverse environmental impacts, as well as additional requirements for maintenance of the public roads network. A similar situation was observed in the BNRR (M6) in the United Kingdom, where an increase in tolls to compensate for lower demand increased diversion to non-tolled alternatives, and in A22 – Algarve (Portugal), in which the introduction of tolls in a shadow toll motorway generated high deviations to the local non-tolled roads reducing project benefits in terms of congestion reduction, safety and environmental

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benefits. In Portugal as a whole, the introduction of tolls in previously untolled roads led to very high allocative inefficiency losses estimated at €0,45 for each €1 of infrastructure charges and related taxes (VAT) charged (Gama Glória, 2014). Another example lies in the Herrentunnel Labeck, in which the population strongly reacted to the tolls by using a free alternative that implies an additional 5 km trip.

The Attiki Odos (Athens Ring Road) can be seen as a specifically interesting case due to the fact that an approach that deviated from allocative efficiency can be seen as a success. By applying a flat rate – equal independently of vehicle type and distance travelled – the system deviates substantially from marginal cost pricing. However, the system was particularly a good fit with its objectives, as the aim of the motorway was to serve traffic traversing the metropolitan area rather than traffic between suburbs.

In some situations the provision of new infrastructures could even improve allocative efficiency by breaking existing monopolies. This situation was identified in the Rion-Antirion bridge, which imposed a competition with the ferries, making these apply a more rational fare pricing compared to the time they had a "monopoly". This change is said to have led to a very significant economic benefit, estimated as 44 million euro from 2001 to 2007.

8.2.5 Acceptability/Equity

The benefits and costs of policies tend to fall unequally on the population, and those who perceive themselves to be losers may declare the policy to be unacceptable. Some funding schemes may simply not be feasible due to acceptability reasons, and this should not be forgotten in the scope of policy advisory. In respect to the elements concurring for the acceptability of a given funding scheme, the following are highlighted:

- Direct benefits of the Project to parties that fund the Project;
- Perception that infrastructure pricing revenue is applied towards a desired objective;
- Perceived equity of the funding scheme;
- Previous application of pricing in similar projects or the same (brownfield) infrastructure.

The qualitative review of case studies confirms the importance of these four elements.

The Ionia – Odos motorway offers a rather typical case of acceptability issues related with the application of road tolls. The Ionia - Odos is a toll motorway concession project of approximately 196 kilometres in length (Greenfield), located in Western Greece. The project also includes 183 km of brownfield sections already constructed by the Greek state under a traditional public works procurement scheme; these sections are tolled and the revenues are used to fund the construction of the new alignment. After a period of some public acceptance of the project, the increase in toll prices by 60% within the recession period was met with severe opposition and affected the public acceptance rate of the project. This was exacerbated by the irrelevance of the two separate sections, the completed one in Eastern Greece and the new one in the West, creating thus a strong notion that the toll payers finance the construction of a remote road on the other side of the country, which they may never even use. Although toll reductions are foreseen for frequent users (maximum possible reduction is 50%), the fact that local communities are not provided with special (or exemption) terms, as it is common for areas adjacent to motorways in Europe, has also caused opposition to the project and further enhanced the ‘I do not pay’ movement across the country. This situation, where the economic crisis has led to reduced acceptability of tolled motorway projects was also observed in other cases, notably the Central Greece (E65) motorway or the BNRR (M6) in the United Kingdom.

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A very similar situation occurred with the Ponte Vasco da Gama in Portugal. The new bridge across the Tagus River in the Lisbon area was financed not only by the revenues generated in the new infrastructure but also by the tolls charged in the "old" bridge, which were increased substantially. This led to major outrests by citizens, including blockages to the 25 de Abril bridge and urged the Government to renegotiate the concession contract even before the bridge was constructed.

Another situation in which the economic crisis and the inability of the State to sustain funding of infrastructure have impacted PPP's acceptability is the A22 – Algarve (Portugal). In this case the project was planned with shadow tolls and enjoyed widespread support. However, the renegotiation of the contract to introduce tolls, while keeping the ROIC relatively stable, led to great opposition by local communities. This reluctance to accept tolls from users used to benefit from "free" motorways was also observed in other locations, notably Radial 2 and the M-12 motorways in Spain or the A23 in Portugal.

The Herrentunnel Labeck is also of particular interest in terms of acceptability. The population was so much against the toll charged in the tunnel that it preferred to excessively use the alternative free-of-charge bypass that is 5 km longer, leaving the project with a large financial gap.
The case of the Attiki Odos (Athens Ring Road) can again be quoted as one of particular interest. The application of the flat rate generated initial resistance, as it appeared to be relatively unfair compared with distance-based charging. However, this turned into an enormous public acceptance as the populations perceived that this pricing regime was appropriate for achieving the objectives of the infrastructure.

The case studies confirm that issues related with acceptability have been the root for project failures. The Horgos – Pozega motorway in Serbia is a good example. In a country with limited PPP tradition the intention granting the right to the concessionaire to collect tolls on highly profitable motorway section from Subotica to Belgrade (estimated AADT 19,000 vehicles per day) whose construction costs the citizens of Vojvodina already had paid (this section was originally financed from foreign loans between 1970 and 1988, and the province administration has paid those loans back) led to questions on whether those bearing the costs of the project would be its main beneficiaries. This added to a complicated project structure to generate widespread debate which increased the political risks to a level that was seen as excessive by some of the financing parties, leading to the cancellation of the contract.

In some cases, acceptability issues are quoted as a major reason behind crontract renegotiations. This has been the case in the Piraeus Container Terminal (Greece), in which strong opposition by the port unions, industrial action and the election of a new government in October of 2009 were behind the renegotiation process.

On the other hand projects such as those of the M-45 in Spain suggest that acceptability may be at stake even when tolls are not introduced. In this case a lack of financial planning by the local transport department suggests that the payments of this infrastructure may consume about all of its resources, creating an unsustainable situation. This adds to an absence of provisions for renegotiation in case of excessive profitability of the private party to raise questions on the equity of fairness of the PPP.

8.2.6 Value Capturing and cost recovery

The issue of 'value capture' is discussed in Deliverable 2.2 as an alternative way of funding in relation to the most common public budget or user-pays approaches. This funding scheme collects revenues by levying parties which directly benefit from the infrastructure or services, not as users, but in the form of increasing property value.

The quantitative assessment revealed that no case studies reported the application of value explicit capture approaches to provide for additional funding. While, as such, this qualitative review did not cover a review of cost recovery issues, it is clear that in many cases cost recovery is an issue and accordingly, alternative

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funding sources are welcome. However, the review did look for examples of cases where Land Value capture could potentially be applied. This seems to be the case in at least two case studies, the Rion-Antirion bridge (Greece) and the Ponte Vasco da Gama (Portugal), which specifically report increases in land value after the project completion. Similarly, the case studies analysis also noted that another area which is often quoted to benefit from transport infrastructure is tourism. Some cases point to the extensive benefits for the tourist sector of the project completion, including the Athens and Cyprus international airports, the Moreas Motorway in Greece and the Millau Viaduct in France. Accordingly, research in finding mechanisms to capture some of this value may prove to be efficient tools to enlarge the sources of funding for transport infrastructure.

8.3 Discussion

The review of the qualitative identification of funding scheme related issues by the BENEFIT case studies has found several examples of manifestation of these issues as relevant aspects for a project's economic and political feasibility and for its overall performance. The validation of issues through examples was strongest on the issues of risk of revenues, allocative efficiency and acceptability. It was weaker in the scope of the revenue incentives issue. On the specific issue of the application of value capture approaches, while this has not been a specific aim of the cases, the contents of a few cases allowed to identify some potential for the application of value capturing to agents which indirectly benefit from the project.

Additionally, the review allowed to identify a close linkage between revenue risk and the acceptability and allocative efficiency issues which could be addressed as hypotheses to test in the coming BENEFIT work. For example:

- A lack of acceptability for the user charging scheme may reduce demand and even exacerbate the use of alternative (free to use) infrastructure; these two aspects will in turn into reduced revenues, as people refrain from using the infrastructure and give preference to alternatives (not necessarily rationally but instead to reflect their lack of acceptability of tolls or user charges);

- The use of brownfield infrastructure charges to finance greenfield infrastructure appears to bear additional acceptability risks and accordingly revenue risks;

- The 'optimism bias' together with the ability to increase user charges often leads to increases in prices; this will both aggravate eventual opposition to the project and generate acceptability problems and further reducing demand, eventually leading to increased revenue risks.

Another aspect worth noting is the role of the economic crisis in affecting the acceptability and revenue risk profile of projects. In many cases it was observed that the economic crisis led to either lower demand (due to reduced economic activity) and/or increased user charges (due to State's inability to cover the infrastructure costs). This has generated, in-turn, acceptability problems and led to the renegotiation of contracts. The detailed analysis of the specific impacts of the economic crisis will be performed in Task 4.3.

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A.1 Review of the literature by references and topics (Descriptive Statistics analysis)

Table A.1 - References of the literature review by topic

Reference	Topic							
	Lessons learned	Transport modes	Project size	Risks and their allocation	Procurement and tendering	Frameworks	Macro-economic context	Social acceptance and opposition
Bain 2009		X		X				X
Blanc-Brude et al. 2009		X		X				
Cantarelli et al. 2010	X							
Clifton et al.2013	X							
COST Action TU1001 2013		X						
Costantini et al. 2012	X							
Cuttaree et al. 2009			X		X	X	X	
Cuttaree and Mandri-Perrot 2010			X				X	
Dimitrou, Ward and Wright 2013				X				
Estache, Juan and Trujillo 2007				X				
EIB 2004				X	X			
EVA-TREN 2008	X							
Flyvberg 2014				X				
HM Treasury 2012				X				
HMT 2004				X				
Iossa, Spagnolo and Vellez 2013				X				
Kappeler and Nemoz 2010							X	
KPMG 2010					X	X	X	X
Major Projects Association 2013		X				X		

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Reference	Topic							
	Lessons learned	Transport modes	Project size	Risks and their allocation	Procurement and tendering	Frameworks	Macro-economic context	Social acceptance and opposition
Meunier and Quinet 2010		X						
Monsalve 2009	X							
Priemus, Flyvberg and van Wee 2008						X		
Queiroz 2005				X		X	X	
Short and Kopp 2005		X						
the World Bank 2005(a)	X							
the World Bank 2005(b)				X				
the World Bank 2006						X		
the World Bank 2014				X		X		
van Wee and Flyvberg 2010	X							

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A.2 List and description of influencing variables manipulated

Table A.2 - List and description of influencing variables manipulated

Variable	Row data	Final indicator	Categories
Actualisation of construction budget	Continuous variable on the construction budget at different years of the timeline.	Range of construction budget. Values actualised at year 2013[58] to make them comparable across all cases.	Ranges [million of Euro, 2013] • lower than 100; • 100-500; • 500-1.000; • higher than 1.000.
Ratio of civil structures (e.g., Bridges, tunnels, etc.) on the investment (range)	Continuous variables within the range [0-100]%.	Range of ratio of civil structures.	Range [%] • 0-25; • 26-50; • 51-100.
Cost/Budgeted of Investments	Percentage variation of actual vs forecast values	Qualitative scale based on the variation of actual vs forecast values	Qualitative scale: • Exceeded forecast, if the ratio is higher than 110%; • In line with forecast, if the ratio is within the range 100%-110%; • Below forecast, if the ratio is within the range 90%-100%; • Far below forecast if the ratio is below 90%.
Delay in beginning of works	Continuous variable on the delay in beginning of works in years	Qualitative scale based on the delay with respect to forecast	Qualitative scale: • Exceeded forecast, if the works began more than 1 year later; • In line with forecast, if the works begun within the first year after the forecast; • Below forecast, if the works begun within the first year before the forecast; • Far below forecast if the works begun more than one year before the forecast.
Delay in completion of works/opening	Continuous variable on the delay	Qualitative scale based on the	Qualitative scale: • Exceeded forecast, if the works ended more than 1 year later;

[58] Actualisation according to the GDP deflator. The initial values is multiplied by the ratio of the GDP deflator at the reference year with the GDP deflator at 2013. Source the World Bank (http://data.worldbank.org/indicator/NY.GDP.DEFL.ZS.)

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of operation	in completion of works/opening of operation in years	delay with respect to forecast	• In line with forecast, if the works ended within the first year after the forecast; • Below forecast, if the works ended within the first year before the forecast; • Far below forecast if the works ended more than one year before the forecast.
Economic impact indicator	Narrative	Qualitative scale based on the narrative content	Qualitative scale: • Positive; • Unchanged; • Negative; • Not determinable.
Social impact indicator	Narrative	Qualitative scale based on the narrative content	Qualitative scale: • Positive; • Unchanged; • Negative; • Not determinable.
Environmental impact indicator	Narrative	Qualitative scale based on the narrative content	Qualitative scale: • Positive; • Unchanged; • Negative; • Not determinable.
Reasons to choose Private (co)financing	Narrative	Qualitative scale based on the narrative content	Qualitative scale: • Minimise public funding; • Minimise public funding and risk sharing; • Risk sharing; • Ensuring value for money; • Speed up implementation; • Experimental; • Several reasons; • Public financed development; • No private interest; • Users tolls and fuel taxes; • Scope modification.
Number of re-negotiations	Continuous variable on the	Range of the number of	Range [year]: • 0;

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	renegotiations	renegotiations	• 1-3; • over 3.
Re-negotiation duration	Continuous variable on the duration in years	Range of years of duration	Range [year]: • 0-3; • over 3.
Re-negotiation final Outcome (impact on project budget)	Mixed	Range of impact of project budget	Range [%]: • 0-50; • over 50.
Incentives	Narrative	Qualitative scale based on the narrative content	Qualitative scale: • Yes; • No.
Conflicting pricing objectives	Narrative	Qualitative scale based on the narrative content	Qualitative scale: • Yes; • No.
Acceptability	Narrative	Qualitative scale based on the narrative content	Qualitative scale: • High; • Opposition; • Decreased; • Moderate.
Project maturity - Time between Tender call and Date project conceived (years)	Continuous variable in years between dates of tender call and project conception	Range of years between dates of tender call and project conception	Range [year]: • 0-5; • 5-10; • over 10.
Time between tender call and project award (years)	Continuous variable in years between tender call and project award	Range of years between tender call and project award	Range [year]: • 0-2; • 2-5; • over 5.
Procurement/tendering – Tendering (PPP)	Multiple choice input of the protocol: • Two stage procedure; • Short list; • Negotiations;	Qualitative scale to account for the degree of complexity of tendering procedure	Qualitative scale: • Low; • Intermediate; • High.

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	• Competitive dialogue; • Open call; • Restricted call; • Others.		
Procurement/tendering Number of Bidders in the 1st Stage (PPP)	Continuous variable on the number of bidders	Range of number of bidders	Range [bidder]: • 0; • 1-3; • over 3.
Procurement/tendering Number of Bidders in negotiations and Number of bidders in final stage (PPP)	Continuous variables on the number of bidders in both stages	Range of number of bidders	Range [bidder] determined from the maximum value amongst the two stages: • 0; • 1-3; • over 3.
Procurement/tendering Duration of project assignment procedure (PPP)	Continuous variable in the duration of project assignment procedure in months	Range of years of duration of project assignment procedure	Range [year]: • 0-1; • 1-3; • over 3.
Contract - Private Provision and Public Authority Provision (activities not transferred) (PPP)	Multiple choice input of the protocol: • Design; • Finance; • Build/construct; • Operate/Manage; • Maintain; • Transfer of Ownership; • Others.	Qualitative indicator to take into account overlaps of the phases	Qualitative indicator: • Design (D); • Finance (F); • Design and Finance (D-F); • Mixed; • No.
Procurement - "Financing" (Construction) Structure (Public project)	Multiple choice input of the protocol: • Public Funds; • Loans; • EU Structural and other Funds; • Other Development Funds (specify);	Simplified indicator	Simplified indicator: • Public Funds (PF); • Public Funds and others (PF and others).

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	• Direct tax sources (fuel tax, tolls, user fees/fares, etc).		
Procurement - "Financing" (Operation & Maintenance Structure) (Public projects)	Multiple choice input of the protocol: • Public Funds; • Public subsidies; • Direct tax sources (fuel tax, tolls, user fees/fares, etc). • User fees (tolls, user fees/fares, etc.); • Other revenues (Advertisements, other entrepreneurial activities, etc.).	Simplified indicator	Simplified indicator: • Public Funds (PF); • Mixed; • Users.
Tendering Construction - Tendering (Public projects)	Multiple choice input of the protocol: • Two stage procedure; • Short list; • Negotiations; • Competitive dialogue; • Open call; • Restricted call; • Others.	Qualitative scale to account for the degree of complexity of tendering procedure	Qualitative scale: • Low; • Intermediate; • High.
Tendering Construction - Number of Bidders in the 1st Stage (Public projects)	Continuous variable on the number of bidders	Range of number of bidders	Range [bidder]: • 0; • 1-3; • over 3.
Construction contract Duration (Public project)	Continuous variable in the duration of construction contract	Range of years of duration of construction contract	Range [year]: • 0-3; • over 3.

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A.3 Cross-tabulations of the third level of analysis

A.3.1 Cost/budgeted of Investments

Table A.3 - Cost/budgeted of Investments with respect to Field (Total)

Field	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	1	7	0	8	21%	13%	88%	0%
Greenfield	6	4	1	11	29%	55%	36%	9%
Both	3	14	2	19	50%	16%	74%	11%
Total	**10**	**25**	**3**	**38**	**100%**	**26%**	**66%**	**8%**

Table A.4 - Cost/budgeted of Investments with respect to Field (PPP)

Field	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	0	3	0	3	12%	0%	100%	0%
Greenfield	5	4	0	9	36%	56%	44%	0%
Both	1	11	1	13	52%	8%	85%	8%
Total	**6**	**18**	**1**	**25**	**100%**	**24%**	**72%**	**4%**

Table A.5 - Cost/budgeted of Investments with respect to Field (Public)

Field	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	1	4	0	5	38%	20%	80%	0%
Greenfield	1	0	1	2	15%	50%	0%	50%
Both	2	3	1	6	46%	33%	50%	17%
Total	**4**	**7**	**2**	**13**	**100%**	**31%**	**54%**	**15%**

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Table A.6 - Cost/budgeted of Investments with respect to Principal transport mode infrastructure (Total)

Principal transport mode infrastructure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	5	13	5	23	55%	22%	57%	22%
Others	5	13	1	19	45%	26%	68%	5%
Total	**10**	**26**	**6**	**42**	**100%**	**24%**	**62%**	**14%**

Table A.7 - Cost/budgeted of Investments with respect to Principal transport mode infrastructure (PPP)

Principal transport mode infrastructure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	4	12	2	18	67%	22%	67%	11%
Others	2	6	1	9	33%	22%	67%	11%
Total	**6**	**18**	**3**	**27**	**100%**	**14%**	**43%**	**7%**

Table A.8 - Cost/budgeted of Investments with respect to Principal transport mode infrastructure (Public)

Principal transport mode infrastructure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	1	1	3	5	33%	20%	20%	60%
Others	3	7	0	10	67%	30%	70%	0%
Total	**4**	**8**	**3**	**15**	**100%**	**10%**	**19%**	**7%**

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Table A.9 - Cost/budgeted of Investments with respect to Project size (Total)

Project size [million €]	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	0	4	2	6	14%	0%	67%	33%
100-500	6	8	1	15	36%	40%	53%	7%
500-1.000	2	5	2	9	21%	22%	56%	22%
higher than 1.000	2	9	1	12	29%	17%	75%	8%
Total	**10**	**26**	**6**	**42**	**100%**	**24%**	**62%**	**14%**

Table A.10 - Cost/budgeted of Investments with respect to Project size (PPP)

Project size [million €]	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	0	2	2	4	15%	0%	50%	50%
100-500	3	4	0	7	26%	43%	57%	0%
500-1.000	2	5	1	8	30%	25%	63%	13%
higher than 1.000	1	7	0	8	30%	13%	88%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.11 - Cost/budgeted of Investments with respect to Project size (Public)

Project size [million €]	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	0	2	0	2	13%	0%	100%	0%
100-500	3	4	1	8	53%	38%	50%	13%
500-1.000	0	0	1	1	7%	0%	0%	100%
higher than 1.000	1	2	1	4	27%	25%	50%	25%
Total	**4**	**8**	**3**	**15**	**100%**	**27%**	**53%**	**20%**

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Table A.12 - Cost/budgeted of Investments with respect to Level of Project Exclusivity (Total)

Level of Project Exclusivity	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	7	7	2	16	38%	44%	44%	13%
Aggregate Exclusive	3	19	4	26	62%	12%	73%	15%
Total	**10**	**26**	**6**	**42**	**100%**	**24%**	**62%**	**14%**

Table A.13 - Cost/budgeted of Investments with respect to Level of Project Exclusivity (PPP)

Level of Project Exclusivity	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	5	4	1	10	37%	50%	40%	10%
Aggregate Exclusive	1	14	2	17	63%	6%	82%	12%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.14 - Cost/budgeted of Investments with respect to Level of Project Exclusivity (PPP)

Level of Project Exclusivity	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	2	3	1	6	40%	33%	50%	17%
Aggregate Exclusive	2	5	2	9	60%	22%	56%	22%
Total	**4**	**8**	**3**	**15**	**100%**	**27%**	**53%**	**20%**

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Table A.15 - Cost/budgeted of Investments with respect to Physical description in terms of network (Total)

Physical description in terms of network	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	0	2	1	3	7%	0%	67%	33%
Link within a Link	1	1	2	4	10%	25%	25%	50%
Node	1	5	0	6	15%	17%	83%	0%
Link	8	17	3	28	68%	29%	61%	11%
Total	**10**	**25**	**6**	**41**	**100%**	**24%**	**61%**	**15%**

Table A.16 - Cost/budgeted of Investments with respect to Physical description in terms of network (PPP)

Physical description in terms of network	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	0	1	1	2	8%	0%	50%	50%
Link within a Link	1	1	1	3	12%	33%	33%	33%
Node	0	3	0	3	12%	0%	100%	0%
Link	5	12	1	18	69%	28%	67%	6%
Total	**6**	**17**	**3**	**26**	**100%**	**23%**	**65%**	**12%**

Table A.17 - Cost/budgeted of Investments with respect to Physical description in terms of network (Public)

Physical description in terms of network	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	0	1	0	1	7%	0%	100%	0%
Link within a Link	0	0	1	1	7%	0%	0%	100%
Node	1	2	0	3	20%	33%	67%	0%
Link	3	5	2	10	67%	30%	50%	20%
Total	**4**	**8**	**3**	**15**	**100%**	**27%**	**53%**	**20%**

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Table A.18 - Cost/budgeted of Investments with respect to Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment (Total)

Ratio of civil structures (eg. Bridges, tunnels, etc.)	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-25	2	9	0	11	44%	18%	82%	0%
26-50	2	5	2	9	36%	22%	56%	22%
51-100	1	3	1	5	20%	20%	60%	20%
Total	**5**	**17**	**3**	**25**	**100%**	**20%**	**68%**	**12%**

Table A.19 - Cost/budgeted of Investments with respect to Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment (PPP)

Ratio of civil structures (eg. Bridges, tunnels, etc.)	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-25	1	5	0	6	43%	17%	83%	0%
26-50	1	4	1	6	43%	17%	67%	17%
51-100	0	1	1	2	14%	0%	50%	50%
Total	**2**	**10**	**2**	**14**	**100%**	**14%**	**71%**	**14%**

Table A.20 - Cost/budgeted of Investments with respect to Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment (Public)

Ratio of civil structures (eg. Bridges, tunnels, etc.)	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-25	1	4	0	5	45%	20%	80%	0%
26-50	1	1	1	3	27%	33%	33%	33%
51-100	1	2	0	3	27%	33%	67%	0%
Total	**3**	**7**	**1**	**11**	**100%**	**27%**	**64%**	**9%**

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Table A.21 - Cost/budgeted of Investments with respect to Type of users (Total)

Type of users	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	0	1	1	2	5%	0%	50%	50%
Only pass./indiv. users	4	8	0	12	29%	33%	67%	0%
Mix use (freight/pass.)	6	16	5	27	64%	22%	59%	19%
Non-transport users	0	1	0	1	2%	0%	100%	0%
Total	**10**	**26**	**6**	**42**	**100%**	**24%**	**62%**	**14%**

Table A.22 - Cost/budgeted of Investments with respect to Type of users (PPP)

Type of users	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	0	1	1	2	7%	0%	50%	50%
Only pass./indiv. users	2	3	0	5	19%	40%	60%	0%
Mix use (freight/pass.)	4	13	2	19	70%	21%	68%	11%
Non-transport users	0	1	0	1	4%	0%	100%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.23 - Cost/budgeted of Investments with respect to Type of users (Public)

Type of users	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	0	0	0	0	0%	0%	0%	0%
Only pass./indiv. users	2	5	0	7	47%	29%	71%	0%
Mix use (freight/pass.)	2	3	3	8	53%	25%	38%	38%
Non-transport users	0	0	0	0	0%	0%	0%	0%
Total	**4**	**8**	**3**	**15**	**100%**	**27%**	**53%**	**20%**

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Table A.24 - Cost/budgeted of Investments with respect to Project locality (Total)

Project Locality	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	4	9	0	13	31%	31%	69%	0%
Outer urban	3	2	3	8	19%	38%	25%	38%
Inter-urban	1	8	0	9	21%	11%	89%	0%
Regional	1	5	3	9	21%	11%	56%	33%
Rural	0	0	0	0	0%	-	-	-
Cross Border	0	0	0	0	0%	-	-	-
International	1	2	0	3	7%	33%	67%	0%
Total	**10**	**26**	**6**	**42**	**100%**	**24%**	**62%**	**14%**

Table A.25 - Cost/budgeted of Investments with respect to Project locality (PPP)

Project Locality	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	2	5	0	7	26%	29%	71%	0%
Outer urban	3	2	2	7	26%	43%	29%	29%
Inter-urban	0	6	0	6	22%	0%	100%	0%
Regional	1	3	1	5	19%	20%	60%	20%
Rural	0	0	0	0	0%	-	-	-
Cross Border	0	0	0	0	0%	-	-	-
International	0	2	0	2	7%	0%	100%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

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Table A.26 - Cost/budgeted of Investments with respect to Project locality (Public)

Project Locality	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	2	4	0	6	40%	33%	67%	0%
Outer urban	0	0	1	1	7%	0%	0%	100%
Inter-urban	1	2	0	3	20%	33%	67%	0%
Regional	0	2	2	4	27%	0%	50%	50%
Rural	0	0	0	0	0%	-	-	-
Cross Border	0	0	0	0	0%	-	-	-
International	1	0	0	1	7%	100%	0%	0%
Total	**4**	**8**	**3**	**15**	**100%**	**27%**	**53%**	**20%**

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Table A.27 - Cost/budgeted of Investments with respect to Type of expected repayment revenues during the operating phase (Total)

Type of expected repayment revenues during the operating phase	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	1	6	1	8	21%	13%	75%	13%
All other forms	9	18	4	31	79%	29%	58%	13%
Total	**10**	**24**	**5**	**39**	**100%**	**26%**	**62%**	**13%**

Table A.28 - Cost/budgeted of Investments with respect to Type of expected repayment revenues during the operating phase (PPP)

Type of expected repayment revenues during the operating phase	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	1	5	1	7	26%	14%	71%	14%
All other forms	5	13	2	20	74%	25%	65%	10%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.29 - Cost/budgeted of Investments with respect to Type of expected repayment revenues during the operating phase (Public)

Type of expected repayment revenues during the operating phase	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	0	1	0	1	8%	0%	100%	0%
All other forms	4	5	2	11	92%	36%	45%	18%
Total	**4**	**6**	**2**	**12**	**100%**	**33%**	**50%**	**17%**

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Table A.30 - Cost/budgeted of Investments with respect to Design Risk Allocation (Total)

Design Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	6	17	4	27	69%	22%	63%	15%
Aggregate public	3	8	1	12	31%	25%	67%	8%
Total	**9**	**25**	**5**	**39**	**100%**	**23%**	**64%**	**13%**

Table A.31 - Cost/budgeted of Investments with respect to Design Risk Allocation (PPP)

Design Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	4	16	3	23	85%	17%	70%	13%
Aggregate public	2	2	0	4	15%	50%	50%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.32 - Cost/budgeted of Investments with respect to Design Risk Allocation (Public)

Design Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	1	1	4	33%	50%	25%	25%
Aggregate public	1	6	1	8	67%	13%	75%	13%
Total	**3**	**7**	**2**	**12**	**100%**	**25%**	**58%**	**17%**

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Table A.33 - Cost/budgeted of Investments with respect to Construction Risk Allocation (Total)

Construction Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	22	4	35	90%	26%	63%	11%
Aggregate public	0	3	1	4	10%	0%	75%	25%
Total	**9**	**25**	**5**	**39**	**100%**	**23%**	**64%**	**13%**

Table A.34 - Cost/budgeted of Investments with respect to Construction Risk Allocation (PPP)

Construction Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	6	17	3	26	96%	23%	65%	12%
Aggregate public	0	1	0	1	4%	0%	100%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.35 - Cost/budgeted of Investments with respect to Construction Risk Allocation (Public)

Construction Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	3	5	1	9	75%	33%	56%	11%
Aggregate public	0	2	1	3	25%	0%	67%	33%
Total	**3**	**7**	**2**	**12**	**100%**	**25%**	**58%**	**17%**

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Table A.36 - Cost/budgeted of Investments with respect to Maintenance Risk Allocation (Total)

Maintenance Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	6	22	3	31	79%	19%	71%	10%
Aggregate public	3	3	2	8	21%	38%	38%	25%
Total	**9**	**25**	**5**	**39**	**100%**	**23%**	**64%**	**13%**

Table A.37 - Cost/budgeted of Investments with respect to Maintenance Risk Allocation (PPP)

Maintenance Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	6	18	3	27	100%	22%	67%	11%
Aggregate public	0	0	0	0	0%	-	-	-
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.38 - Cost/budgeted of Investments with respect to Maintenance Risk Allocation (Public)

Maintenance Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	4	0	4	33%	0%	100%	0%
Aggregate public	3	3	2	8	67%	38%	38%	25%
Total	**3**	**7**	**2**	**12**	**100%**	**25%**	**58%**	**17%**

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Table A.39 - Cost/budgeted of Investments with respect to Exploitation Risk Allocation (Total)

Exploitation Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	5	15	1	21	62%	24%	71%	5%
Aggregate public	2	7	4	13	38%	15%	54%	31%
Total	**7**	**22**	**5**	**34**	**100%**	**21%**	**65%**	**15%**

Table A.40 - Cost/budgeted of Investments with respect to Exploitation Risk Allocation (PPP)

Exploitation Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	5	13	1	19	76%	26%	68%	5%
Aggregate public	0	4	2	6	24%	0%	67%	33%
Total	**5**	**17**	**3**	**25**	**100%**	**20%**	**68%**	**12%**

Table A.41 - Cost/budgeted of Investments with respect to Exploitation Risk Allocation (Public)

Exploitation Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	2	0	2	22%	0%	100%	0%
Aggregate public	2	3	2	7	78%	29%	43%	29%
Total	**2**	**5**	**2**	**9**	**100%**	**22%**	**56%**	**22%**

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Table A.42 - Cost/budgeted of Investments with respect to Commercial/Revenue Risk Allocation (Total)

Commercial/Revenue Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	5	17	2	24	59%	21%	71%	8%
Aggregate public	5	9	3	17	41%	29%	53%	18%
Total	**10**	**26**	**5**	**41**	**100%**	**24%**	**63%**	**12%**

Table A.43 - Cost/budgeted of Investments with respect to Commercial/Revenue Risk Allocation (PPP)

Commercial/Revenue Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	5	14	2	21	78%	24%	67%	10%
Aggregate public	1	4	1	6	22%	17%	67%	17%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.44 - Cost/budgeted of Investments with respect to Commercial/Revenue Risk Allocation (Public)

Commercial/Revenue Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	3	0	3	21%	0%	100%	0%
Aggregate public	4	5	2	11	79%	36%	45%	18%
Total	**4**	**8**	**2**	**14**	**100%**	**29%**	**57%**	**14%**

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Table A.45 - Cost/budgeted of Investments with respect to Financial Risk Allocation (Total)

Financial Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	6	18	3	27	75%	22%	67%	11%
Aggregate public	2	5	2	9	25%	22%	56%	22%
Total	**8**	**23**	**5**	**36**	**100%**	**22%**	**64%**	**14%**

Table A.46 - Cost/budgeted of Investments with respect to Financial Risk Allocation (PPP)

Financial Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	6	17	3	26	96%	23%	65%	12%
Aggregate public	0	1	0	1	4%	0%	100%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.47 - Cost/budgeted of Investments with respect to Financial Risk Allocation (Public)

Financial Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	1	0	1	11%	0%	100%	0%
Aggregate public	2	4	2	8	89%	25%	50%	25%
Total	**2**	**5**	**2**	**9**	**100%**	**22%**	**56%**	**22%**

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Table A.48 - Cost/budgeted of Investments with respect to Regulatory Risk Allocation (Total)

Regulatory Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	2	2	5%	0%	0%	100%
Aggregate public	9	24	2	35	95%	26%	69%	6%
Total	**9**	**24**	**4**	**37**	**100%**	**24%**	**65%**	**11%**

Table A.49 - Cost/budgeted of Investments with respect to Regulatory Risk Allocation (PPP)

Regulatory Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	2	2	8%	0%	0%	100%
Aggregate public	6	17	1	24	92%	25%	71%	4%
Total	**6**	**17**	**3**	**26**	**100%**	**23%**	**65%**	**12%**

Table A.50 - Cost/budgeted of Investments with respect to Regulatory Risk Allocation (Public)

Regulatory Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	0	0	0%	-	-	-
Aggregate public	3	7	1	11	100%	27%	64%	9%
Total	**3**	**7**	**1**	**11**	**100%**	**27%**	**64%**	**9%**

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Table A.51 - Cost/budgeted of Investments with respect to Force majeure Risk Allocation (Total)

Force majeure Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	3	2	7	18%	29%	43%	29%
Aggregate public	7	21	3	31	82%	23%	68%	10%
Total	**9**	**24**	**5**	**38**	**100%**	**24%**	**63%**	**13%**

Table A.52 - Cost/budgeted of Investments with respect to Force majeure Risk Allocation (PPP)

Force majeure Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	2	2	6	23%	33%	33%	33%
Aggregate public	4	15	1	20	77%	20%	75%	5%
Total	**6**	**17**	**3**	**26**	**100%**	**23%**	**65%**	**12%**

Table A.53 - Cost/budgeted of Investments with respect to Force majeure Risk Allocation (Public)

Force majeure Risk Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	1	0	1	8%	0%	100%	0%
Aggregate public	3	6	2	11	92%	27%	55%	18%
Total	**3**	**7**	**2**	**12**	**100%**	**25%**	**58%**	**17%**

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Table A.54 - Cost/budgeted of Investments with respect to Other Risk Specific Allocation (Total)

Other Risk Specific Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	1	0	3	15%	67%	33%	0%
Aggregate public	3	12	2	17	85%	18%	71%	12%
Total	**5**	**13**	**2**	**20**	**100%**	**25%**	**65%**	**10%**

Table A.55 - Cost/budgeted of Investments with respect to Other Risk Specific Allocation (PPP)

Other Risk Specific Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	1	0	2	13%	50%	50%	0%
Aggregate public	3	10	0	13	87%	23%	77%	0%
Total	**4**	**11**	**0**	**15**	**100%**	**27%**	**73%**	**0%**

Table A.56 - Cost/budgeted of Investments with respect to Other Risk Specific Allocation (Public)

Other Risk Specific Allocation	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	0	0	1	20%	100%	0%	0%
Aggregate public	0	2	2	4	80%	0%	50%	50%
Total	**1**	**2**	**2**	**5**	**100%**	**20%**	**40%**	**40%**

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Table A.57 - Cost/budgeted of Investments with respect to Project maturity - Time between Tender call and Date project conceived (Total)

Project maturity - Time between Tender call and Date project conceived	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	4	12	2	18	60%	22%	67%	11%
5-10	3	3	1	7	23%	43%	43%	14%
over 10	1	4	0	5	17%	20%	80%	0%
Total	**8**	**19**	**3**	**30**	**100%**	**27%**	**63%**	**10%**

Table A.58 - Cost/budgeted of Investments with respect to Project maturity - Time between Tender call and Date project conceived (PPP)

Project maturity - Time between Tender call and Date project conceived	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	2	10	1	13	52%	15%	77%	8%
5-10	3	3	1	7	28%	43%	43%	14%
over 10	1	4	0	5	20%	20%	80%	0%
Total	**6**	**17**	**2**	**25**	**100%**	**24%**	**68%**	**8%**

Table A.59 - Cost/budgeted of Investments with respect to Project maturity - Time between Tender call and Date project conceived (Public)

Project maturity - Time between Tender call and Date project conceived	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	2	2	1	5	100%	40%	40%	20%
5-10	0	0	0	0	0%	-	-	-
over 10	0	0	0	0	0%	-	-	-
Total	**2**	**2**	**1**	**5**	**100%**	**40%**	**40%**	**20%**

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Table A.60 - Cost/budgeted of Investments with respect to Project procurement - Time between tender call and project award (Total)

Project procurement - Time between tender call and project award	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-2	6	12	0	18	67%	33%	67%	0%
2-5	0	3	1	4	15%	0%	75%	25%
over 5	2	2	1	5	19%	40%	40%	20%
Total	**8**	**17**	**2**	**27**	**100%**	**30%**	**63%**	**7%**

Table A.61 - Cost/budgeted of Investments with respect to Project procurement - Time between tender call and project award (PPP)

Project procurement - Time between tender call and project award	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-2	4	11	0	15	65%	27%	73%	0%
2-5	0	3	0	3	13%	0%	100%	0%
over 5	2	2	1	5	22%	40%	40%	20%
Total	**6**	**16**	**1**	**23**	**100%**	**26%**	**70%**	**4%**

Table A.62 - Cost/budgeted of Investments with respect to Project procurement - Time between tender call and project award (Public)

Project procurement - Time between tender call and project award	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-2	2	1	0	3	75%	67%	33%	0%
2-5	0	0	1	1	25%	0%	0%	100%
over 5	0	0	0	0	0%	-	-	-
Total	**2**	**1**	**1**	**4**	**100%**	**50%**	**25%**	**25%**

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Table A.63 - Cost/budgeted of Investments with respect to Procurement/tendering - Tendering - Complexity of the procedure (Total)

Procurement/tendering - Tendering - Complexity of the procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	3	11	1	15	58%	20%	73%	7%
Intermediate	3	5	1	9	35%	33%	56%	11%
High	0	2	0	2	8%	0%	100%	0%
Total	**6**	**18**	**2**	**26**	**100%**	**23%**	**69%**	**8%**

Table A.64 - Cost/budgeted of Investments with respect to Procurement/tendering - Tendering - Complexity of the procedure (PPP)

Procurement/tendering - Tendering - Complexity of the procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	3	11	1	15	58%	20%	73%	7%
Intermediate	3	5	1	9	35%	33%	56%	11%
High	0	2	0	2	8%	0%	100%	0%
Total	**6**	**18**	**2**	**26**	**100%**	**23%**	**69%**	**8%**

Table A.65 - Cost/budgeted of Investments with respect to Procurement/tendering - Tendering - Complexity of the procedure (Public)

Procurement/tendering - Tendering - Complexity of the procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	0	0	0	0	-	-	-	-
Intermediate	0	0	0	0	-	-	-	-
High	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.66 - Cost/budgeted of Investments with respect to Procurement/tendering - Range Number of Bidders in the 1st Stage (Total)

Procurement/tendering - Range Number of Bidders in the 1st Stage	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	2	5	1	8	30%	25%	63%	13%
1-3	2	8	0	10	37%	20%	80%	0%
over 3	2	5	2	9	33%	22%	56%	22%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.67 - Cost/budgeted of Investments with respect to Procurement/tendering - Range Number of Bidders in the 1st Stage (PPP)

Procurement/tendering - Range Number of Bidders in the 1st Stage	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	2	5	1	8	30%	25%	63%	13%
1-3	2	8	0	10	37%	20%	80%	0%
over 3	2	5	2	9	33%	22%	56%	22%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.68 - Cost/budgeted of Investments with respect to Procurement/tendering - Range Number of Bidders in the 1st Stage (Public)

Procurement/tendering - Range Number of Bidders in the 1st Stage	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	0	0	0	-	-	-	-
1-3	0	0	0	0	-	-	-	-
over 3	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.69 - Cost/budgeted of Investments with respect to Range Maximum of Bidders in negotiations and bidders in final stage (Total)

Range Maximum of Bidders in negotiations and bidders in final stage	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	0	1	1	4%	0%	0%	100%
1-3	5	15	1	21	78%	24%	71%	5%
over 3	1	3	1	5	19%	20%	60%	20%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.70 - Cost/budgeted of Investments with respect to Range Maximum of Bidders in negotiations and bidders in final stage (PPP)

Range Maximum of Bidders in negotiations and bidders in final stage	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	0	1	1	4%	0%	0%	100%
1-3	5	15	1	21	78%	24%	71%	5%
over 3	1	3	1	5	19%	20%	60%	20%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.71 - Cost/budgeted of Investments with respect to Range Maximum of Bidders in negotiations and bidders in final stage (Public)

Range Maximum of Bidders in negotiations and bidders in final stage	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	0	0	0	-	-	-	-
1-3	0	0	0	0	-	-	-	-
over 3	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.72 - Cost/budgeted of Investments with respect to Procurement/tendering - Range Duration of project assignment procedure (Total)

Procurement/tendering - Range Duration of project assignment procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-1	2	6	1	9	33%	22%	67%	11%
1-3	4	7	2	13	48%	31%	54%	15%
over 3	0	5	0	5	19%	0%	100%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.73 - Cost/budgeted of Investments with respect to Procurement/tendering - Range Duration of project assignment procedure (PPP)

Procurement/tendering - Range Duration of project assignment procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-1	2	6	1	9	33%	22%	67%	11%
1-3	4	7	2	13	48%	31%	54%	15%
over 3	0	5	0	5	19%	0%	100%	0%
Total	**6**	**18**	**3**	**27**	**100%**	**22%**	**67%**	**11%**

Table A.74 - Cost/budgeted of Investments with respect to Procurement/tendering - Range Duration of project assignment procedure (Public)

Procurement/tendering - Range Duration of project assignment procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-1	0	0	0	0	-	-	-	-
1-3	0	0	0	0	-	-	-	-
over 3	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.75 - Cost/budgeted of Investments with respect to Contract - Overlaps (Total)

Contract - Overlaps	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
D	2	4	0	6	26%	33%	67%	0%
F	0	4	1	5	22%	0%	80%	20%
Mixed	2	7	0	9	39%	22%	78%	0%
No	0	2	1	3	13%	0%	67%	33%
Total	**4**	**17**	**2**	**23**	**100%**	**17%**	**74%**	**9%**

Table A.76 - Cost/budgeted of Investments with respect to Contract - Overlaps (PPP)

Contract - Overlaps	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
D	2	4	0	6	26%	33%	67%	0%
F	0	4	1	5	22%	0%	80%	20%
Mixed	2	7	0	9	39%	22%	78%	0%
No	0	2	1	3	13%	0%	67%	33%
Total	**4**	**17**	**2**	**23**	**100%**	**17%**	**74%**	**9%**

Table A.77 - Cost/budgeted of Investments with respect to Contract - Overlaps (Public)

Contract - Overlaps	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
D	0	0	0	0	-	-	-	-
F	0	0	0	0	-	-	-	-
Mixed	0	0	0	0	-	-	-	-
No	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.78 - Cost/budgeted of Investments with respect to Procurement - Delivery (Construction) (Total)

Procurement - Delivery (Construction)	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Design - Build	1	4	1	6	43%	17%	67%	17%
Design Bid Build	3	3	2	8	57%	38%	38%	25%
Total	**4**	**7**	**3**	**14**	**100%**	**29%**	**50%**	**21%**

Table A.79 - Cost/budgeted of Investments with respect to Procurement - Delivery (Construction) (PPP)

Procurement - Delivery (Construction)	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Design - Build	0	0	0	0	-	-	-	-
Design Bid Build	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.80 - Cost/budgeted of Investments with respect to Procurement - Delivery (Construction) (Public)

Procurement - Delivery (Construction)	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Design - Build	1	4	1	6	43%	17%	67%	17%
Design Bid Build	3	3	2	8	57%	38%	38%	25%
Total	**4**	**7**	**3**	**14**	**100%**	**29%**	**50%**	**21%**

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Table A.81 - Cost/budgeted of Investments with respect to Procurement - "Financing" (Construction) Structure (Total)

Procurement - "Financing" (Construction) Structure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	2	4	1	7	50%	29%	57%	14%
PF and others	2	4	1	7	50%	29%	57%	14%
Total	**4**	**8**	**2**	**14**	**100%**	**29%**	**57%**	**14%**

Table A.82 - Cost/budgeted of Investments with respect to Procurement - "Financing" (Construction) Structure (PPP)

Procurement - "Financing" (Construction) Structure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	0	0	0	0	-	-	-	-
PF and others	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.83 - Cost/budgeted of Investments with respect to Procurement - "Financing" (Construction) Structure (Public)

Procurement - "Financing" (Construction) Structure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	2	4	1	7	50%	29%	57%	14%
PF and others	2	4	1	7	50%	29%	57%	14%
Total	**4**	**8**	**2**	**14**	**100%**	**29%**	**57%**	**14%**

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Table A.84 - Cost/budgeted of Investments with respect to Tendering Construction - Tendering - Complexity of the procedure (Total)

Tendering Construction - Tendering - Complexity of the procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	1	6	2	9	75%	11%	67%	22%
Intermediate	1	1	0	2	17%	50%	50%	0%
High	1	0	0	1	8%	100%	0%	0%
Total	**3**	**7**	**2**	**12**	**100%**	**25%**	**58%**	**17%**

Table A.85 - Cost/budgeted of Investments with respect to Tendering Construction - Tendering - Complexity of the procedure (PPP)

Tendering Construction - Tendering - Complexity of the procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	0	0	0	0	-	-	-	-
Intermediate	0	0	0	0	-	-	-	-
High	0	0	0	0	-	-	-	-
Total	0	0	0	0	-	-	-	-

Table A.86 - Cost/budgeted of Investments with respect to Tendering Construction - Tendering - Complexity of the procedure (Public)

Tendering Construction - Tendering - Complexity of the procedure	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	1	6	2	9	75%	11%	67%	22%
Intermediate	1	1	0	2	17%	50%	50%	0%
High	1	0	0	1	8%	100%	0%	0%
Total	**3**	**7**	**2**	**12**	**100%**	**25%**	**58%**	**17%**

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Table A.87 - Cost/budgeted of Investments with respect to Construction contract - Contract Type (Total)

Construction contract - Contract Type	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Lump Sum	3	4	1	8	62%	38%	50%	13%
Unit Cost	1	2	2	5	38%	20%	40%	40%
Turn Key	0	0	0	0	0%	-	-	-
Total	**4**	**6**	**3**	**13**	**100%**	**31%**	**46%**	**23%**

Table A.88 - Cost/budgeted of Investments with respect to Construction contract - Contract Type (PPP)

Construction contract - Contract Type	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Lump Sum	0	0	0	0	-	-	-	-
Unit Cost	0	0	0	0	-	-	-	-
Turn Key	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.89 - Cost/budgeted of Investments with respect to Construction contract - Contract Type (Public)

Construction contract - Contract Type	Cost/budgeted of Investments							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Lump Sum	3	4	1	8	62%	38%	50%	13%
Unit Cost	1	2	2	5	38%	20%	40%	40%
Turn Key	0	0	0	0	0%	-	-	-
Total	**4**	**6**	**3**	**13**	**100%**	**31%**	**46%**	**23%**

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A.3.2 Actual traffic vs forecasts

Table A.90 - Actual traffic vs forecasts with respect to Field (Total)

Principal transport mode infrastructure	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	4	4	1	4	18%	44%	44%	11%
Greenfield	8	4	5	8	34%	47%	24%	29%
Both	10	7	7	10	48%	42%	29%	29%
Total	**22**	**15**	**13**	**22**	**100%**	**44%**	**30%**	**26%**

Table A.91 - Actual traffic vs forecasts with respect to Field (PPP)

Principal transport mode infrastructure	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	1	2	0	**3**	9%	33%	67%	0%
Greenfield	6	4	4	**14**	42%	43%	29%	29%
Both	4	7	5	**16**	48%	25%	44%	31%
Total	**11**	**13**	**9**	**33**	**100%**	**33%**	**39%**	**27%**

Table A.92 - Actual traffic vs forecasts with respect to Field (Public)

Principal transport mode infrastructure	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	3	2	1	**6**	35%	50%	33%	17%
Greenfield	2	0	1	**3**	18%	67%	0%	33%
Both	6	0	2	**8**	47%	75%	0%	25%
Total	**11**	**2**	**4**	**17**	**100%**	**65%**	**12%**	**24%**

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Table A.93 - Actual traffic vs forecasts with respect to Principal transport mode infrastructure (Total)

Principal transport mode infrastructure	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	9	7	14	30	47%	30%	23%	47%
Others	13	9	12	34	53%	38%	26%	35%
Total	**22**	**16**	**26**	**64**	**100%**	**34%**	**25%**	**41%**

Table A.94 - Actual traffic vs forecasts with respect to Principal transport mode infrastructure (PPP)

Principal transport mode infrastructure	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	7	6	11	24	56%	29%	25%	46%
Others	4	7	8	19	44%	21%	37%	42%
Total	**11**	**13**	**19**	**43**	**100%**	**26%**	**30%**	**44%**

Table A.95 - Actual traffic vs forecasts with respect to Principal transport mode infrastructure (Public)

Principal transport mode infrastructure	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	2	1	3	6	29%	33%	17%	50%
Others	9	2	4	15	71%	60%	13%	27%
Total	**11**	**3**	**7**	**21**	**100%**	**52%**	**14%**	**33%**

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Table A.96 - Actual traffic vs forecasts with respect to Project size (Total)

Project size [million €]	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	1	5	2	8	13%	13%	63%	25%
100-500	5	6	10	21	33%	24%	29%	48%
500-1.000	4	3	6	13	20%	31%	23%	46%
higher than 1.000	12	2	8	22	34%	55%	9%	36%
Total	**22**	**16**	**26**	**64**	**100%**	**34%**	**25%**	**41%**

Table A.97 - Actual traffic vs forecasts with respect to Project size (PPP)

Project size [million €]	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	1	4	1	6	14%	17%	67%	17%
100-500	3	5	6	14	33%	21%	36%	43%
500-1.000	2	3	6	11	26%	18%	27%	55%
higher than 1.000	5	1	6	12	28%	42%	8%	50%
Total	**11**	**13**	**19**	**43**	**100%**	**26%**	**30%**	**44%**

Table A.98 - Actual traffic vs forecasts with respect to Project size (Public)

Project size [million €]	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	0	1	1	2	10%	0%	50%	50%
100-500	2	1	4	7	33%	29%	14%	57%
500-1.000	2	0	0	2	10%	100%	0%	0%
higher than 1.000	7	1	2	10	48%	70%	10%	20%
Total	**11**	**3**	**7**	**21**	**100%**	**52%**	**14%**	**33%**

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Table A.99 - Actual traffic vs forecasts with respect to Level of Project Exclusivity (Total)

Level of Project Exclusivity	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	6	7	10	23	37%	26%	30%	43%
Aggregate Exclusive	16	8	16	40	63%	40%	20%	40%
Total	**22**	**15**	**26**	**63**	**100%**	**35%**	**24%**	**41%**

Table A.100 - Actual traffic vs forecasts with respect to Level of Project Exclusivity (PPP)

Level of Project Exclusivity	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	2	5	8	15	36%	13%	33%	53%
Aggregate Exclusive	9	7	11	27	64%	33%	26%	41%
Total	**11**	**12**	**19**	**42**	**100%**	**26%**	**29%**	**45%**

Table A.101 - Actual traffic vs forecasts with respect to Level of Project Exclusivity (Public)

Level of Project Exclusivity	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	4	2	2	8	38%	50%	25%	25%
Aggregate Exclusive	7	1	5	13	62%	54%	8%	38%
Total	**11**	**3**	**7**	**21**	**100%**	**52%**	**14%**	**33%**

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Table A.102 - Actual traffic vs forecasts with respect to Physical description in terms of network (Total)

Physical description in terms of network	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	3	1	1	5	8%	60%	20%	20%
Link within a Link	6	0	3	9	14%	67%	0%	33%
Node	3	1	5	9	14%	33%	11%	56%
Link	10	13	17	40	63%	25%	33%	43%
Total	**22**	**15**	**26**	**63**	**100%**	**35%**	**24%**	**41%**

Table A.103 - Actual traffic vs forecasts with respect to Physical description in terms of network (PPP)

Physical description in terms of network	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	1	1	1	3	7%	33%	33%	33%
Link within a Link	2	0	2	4	10%	50%	0%	50%
Node	2	0	3	5	12%	40%	0%	60%
Link	6	11	13	30	71%	20%	37%	43%
Total	**11**	**12**	**19**	**42**	**100%**	**26%**	**29%**	**45%**

Table A.104 - Actual traffic vs forecasts with respect to Physical description in terms of network (Public)

Physical description in terms of network	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	2	0	0	2	10%	100%	0%	0%
Link within a Link	4	0	1	5	24%	80%	0%	20%
Node	1	1	2	4	19%	25%	25%	50%
Link	4	2	4	10	48%	40%	20%	40%
Total	**11**	**3**	**7**	**21**	**100%**	**52%**	**14%**	**33%**

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Table A.105 - Actual traffic vs forecasts with respect to Type of users (Total)

Type of users	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	2	2	1	5	8%	40%	40%	20%
Only pass./indiv. users	9	7	5	21	34%	43%	33%	24%
Mix use (freight/pass.)	9	7	20	36	58%	25%	19%	56%
Non-transport users	0	0	0	0	0%	-	-	-
Total	**20**	**16**	**26**	**62**	**100%**	**32%**	**26%**	**42%**

Table A.106 - Actual traffic vs forecasts with respect to Type of users (PPP)

Type of users	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	2	2	1	5	12%	40%	40%	20%
Only pass./indiv. users	2	5	3	10	23%	20%	50%	30%
Mix use (freight/pass.)	7	6	15	28	65%	25%	21%	54%
Non-transport users	0	0	0	0	0%	-	-	-
Total	**11**	**13**	**19**	**43**	**100%**	**26%**	**30%**	**44%**

Table A.107 - Actual traffic vs forecasts with respect to Type of users (Public)

Type of users	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	0	0	0	0	0%	-	-	-
Only pass./indiv. users	7	2	2	11	58%	64%	18%	18%
Mix use (freight/pass.)	2	1	5	8	42%	25%	13%	63%
Non-transport users	0	0	0	0	0%	-	-	-
Total	**9**	**3**	**7**	**19**	**100%**	**47%**	**16%**	**37%**

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Table A.108 - Actual traffic vs forecasts with respect to Per capita GDP of the region at the time of data collection of the project with respect to GDP at project award (Total)

Per capita GDP of the region at the time of data collection of the project with respect to GDP at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
higher	6	4	6	16	31%	38%	25%	38%
in line	5	7	1	13	25%	38%	54%	8%
lower	7	3	12	22	43%	32%	14%	55%
Total	**18**	**14**	**19**	**51**	**100%**	**35%**	**27%**	**37%**

Table A.109 - Actual traffic vs forecasts with respect to Per capita GDP of the region at the time of data collection of the project with respect to GDP at project award (PPP)

Per capita GDP of the region at the time of data collection of the project with respect to GDP at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
higher	1	4	2	7	22%	14%	57%	29%
in line	3	5	0	8	25%	38%	63%	0%
lower	5	2	10	17	53%	29%	12%	59%
Total	**9**	**11**	**12**	**32**	**100%**	**28%**	**34%**	**38%**

Table A.110 - Actual traffic vs forecasts with respect to Per capita GDP of the region at the time of data collection of the project with respect to GDP at project award (Public)

Per capita GDP of the region at the time of data collection of the project with respect to GDP at project award.	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
higher	5	0	4	9	47%	56%	0%	44%
in line	2	2	1	5	26%	40%	40%	20%
lower	2	1	2	5	26%	40%	20%	40%
Total	**9**	**3**	**7**	**19**	**100%**	**47%**	**16%**	**37%**

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Table A.111 - Actual traffic vs forecasts with respect to Project Locality (Total)

Project Locality	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	9	7	5	21	34%	43%	33%	24%
Outer urban	1	4	8	13	21%	8%	31%	62%
Inter-urban	3	3	6	12	19%	25%	25%	50%
Regional	5	2	4	11	18%	45%	18%	36%
Rural	1	0	0	1	2%	100%	0%	0%
Cross Border	0	0	0	0	0%	-	-	-
International	1	0	3	4	6%	25%	0%	75%
Total	**20**	**16**	**26**	**62**	**100%**	**32%**	**26%**	**42%**

Table A.112 - Actual traffic vs forecasts with respect to Project Locality (PPP)

Project Locality	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	4	5	4	13	30%	31%	38%	31%
Outer urban	1	4	5	10	23%	10%	40%	50%
Inter-urban	2	2	4	8	19%	25%	25%	50%
Regional	3	2	3	8	19%	38%	25%	38%
Rural	1	0	0	1	2%	100%	0%	0%
Cross Border	0	0	0	0	0%	-	-	-
International	0	0	3	3	7%	0%	0%	100%
Total	**11**	**13**	**19**	**43**	**100%**	**26%**	**30%**	**44%**

Table A.113 - Actual traffic vs forecasts with respect to Project Locality (Public)

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Project Locality	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	5	2	1	8	42%	63%	25%	13%
Outer urban	0	0	3	3	16%	0%	0%	100%
Inter-urban	1	1	2	4	21%	25%	25%	50%
Regional	2	0	1	3	16%	67%	0%	33%
Rural	0	0	0	0	0%	-	-	-
Cross Border	0	0	0	0	0%	-	-	-
International	1	0	0	1	5%	100%	0%	0%
Total	**9**	**3**	**7**	**19**	**100%**	**47%**	**16%**	**37%**

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Table A.114 - Actual traffic vs forecasts with respect to Population density fo the region at the time of data collection of the project with respect to density at project award (Total)

Population density of the region at the time of data collection of the project with respect to density at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Higher	8	9	10	27	52%	30%	33%	37%
unchanged	5	2	9	16	31%	31%	13%	56%
Lower	3	0	6	9	17%	33%	0%	67%
Total	**16**	**11**	**25**	**52**	**100%**	**31%**	**21%**	**48%**

Table A.115 - Actual traffic vs forecasts with respect to Population density fo the region at the time of data collection of the project with respect to density at project award (PPP)

Population density fo the region at the time of data collection of the project with respect to density at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Higher	3	8	9	20	54%	15%	40%	45%
unchanged	3	1	6	10	27%	30%	10%	60%
Lower	3	0	4	7	19%	43%	0%	57%
Total	**9**	**9**	**19**	**37**	**100%**	**47%**	**13%**	**40%**

Table A.116 - Actual traffic vs forecasts with respect to Population density fo the region at the time of data collection of the project with respect to density at project award (Public)

Population density fo the region at the time of data collection of the project with respect to density at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
higher	5	1	1	7	47%	71%	14%	14%
unchanged	2	1	3	6	40%	33%	17%	50%
lower	0	0	2	2	13%	0%	0%	100%
Total	**7**	**2**	**6**	**15**	**100%**	**47%**	**13%**	**40%**

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Table A.117 - Actual traffic vs forecasts with respect to Level of industrialization and economic activities in the region at the time of data collection of the project with respect to density at project award (Total)

Level of industrialization and economic activities in the region at the time of data collection of the project with respect to industrialization at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Higher	4	7	9	20	43%	20%	35%	45%
unchanged	6	3	10	19	41%	32%	16%	53%
Lower	2	1	4	7	15%	29%	14%	57%
Total	**12**	**11**	**23**	**46**	**100%**	**26%**	**24%**	**50%**

Table A.118 - Actual traffic vs forecasts with respect to Level of industrialization and economic activities in the region at the time of data collection of the project with respect to density at project award (PPP)

Level of industrialization and economic activities in the region at the time of data collection of the project with respect to industrialization at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
higher	2	6	7	15	45%	13%	40%	47%
unchanged	4	2	5	11	33%	36%	18%	45%
lower	2	1	4	7	21%	29%	14%	57%
Total	**8**	**9**	**16**	**33**	**100%**	**24%**	**27%**	**48%**

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Table A.119 - Actual traffic vs forecasts with respect to Level of industrialization and economic activities in the region at the time of data collection of the project with respect to density at project award (Public)

Level of industrialization and economic activities in the region at the time of data collection of the project with respect to industrialization at project award	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
higher	2	1	2	5	38%	40%	20%	40%
unchanged	2	1	5	8	62%	25%	13%	63%
lower	0	0	0	0	0%	-	-	-
Total	**4**	**2**	**7**	**13**	**100%**	**31%**	**15%**	**54%**

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Table A.120 - Actual traffic vs forecasts with respect to Type of expected repayment revenues during the operating phase (Total)

Type of expected repayment revenues during the operating phase	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	4	1	5	10	19%	40%	10%	50%
All other forms	12	14	18	44	81%	27%	32%	41%
Total	**16**	**15**	**23**	**54**	**100%**	**30%**	**28%**	**43%**

Table A.121 - Actual traffic vs forecasts with respect to Type of expected repayment revenues during the operating phase (PPP)

Type of expected repayment revenues during the operating phase	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	4	1	5	10	24%	40%	10%	50%
All other forms	7	12	13	32	76%	22%	38%	41%
Total	**11**	**13**	**18**	**42**	**100%**	**26%**	**31%**	**43%**

Table A.122 - Actual traffic vs forecasts with respect to Type of expected repayment revenues during the operating phase (Public)

Type of expected repayment revenues during the operating phase	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	0	0	0	0	0%	-	-	-
All other forms	5	2	5	12	100%	42%	17%	42%
Total	**5**	**2**	**5**	**12**	**100%**	**42%**	**17%**	**42%**

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Table A.123 - Actual traffic vs forecasts with respect to User charges proposed (Total)

User charges are:	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Proposed by the promoter (project Sponsor), but approved by the public authorities	5	4	7	16	38%	31%	25%	44%
Autonomously decided by the promoter (project Sponsor)	1	0	4	5	12%	20%	0%	80%
Imposed by the public authority	7	2	8	17	40%	41%	12%	47%
Other	1	0	3	4	10%	25%	0%	75%
Total	**14**	**6**	**22**	**42**	**100%**	**33%**	**14%**	**52%**

Table A.124 - Actual traffic vs forecasts with respect to User charges proposed (PPP)

User charges are:	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Proposed by the promoter (project Sponsor), but approved by the public authorities	5	4	7	16	53%	31%	25%	44%
Autonomously decided by the promoter (project Sponsor)	1	0	4	5	17%	20%	0%	80%
Imposed by the public authority	2	0	4	6	20%	33%	0%	67%
Other	1	0	2	3	10%	33%	0%	67%
Total	**9**	**4**	**17**	**30**	**100%**	**30%**	**13%**	**57%**

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Table A.125 - Actual traffic vs forecasts with respect to User charges proposed (Public)

User charges are:	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Proposed by the promoter (project Sponsor), but approved by the public authorities	0	0	0	0	0%	-	-	-
Autonomously decided by the promoter (project Sponsor)	0	0	0	0	0%	-	-	-
Imposed by the public authority	5	2	4	11	92%	45%	18%	36%
Other	0	0	1	1	8%	0%	0%	100%
Total	**5**	**2**	**5**	**12**	**100%**	**42%**	**17%**	**42%**

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Table A.126 - Actual traffic vs forecasts with respect to Main project purpose for the Contracting Authority (Total)

Main project purpose for the Contracting Authority	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Reducing travel time	9	9	11	29	71%	31%	31%	38%
Reducing travel costs	1	0	0	1	2%	100%	0%	0%
Relieving congestion	3	1	3	7	17%	43%	14%	43%
Impr. rel. of transport	0	0	4	4	10%	0%	0%	100%
Total	**13**	**10**	**18**	**41**	**100%**	**32%**	**24%**	**44%**

Table A.127 - Actual traffic vs forecasts with respect to Main project purpose for the Contracting Authority (PPP)

Main project purpose for the Contracting Authority	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Reducing travel time	6	7	7	20	71%	30%	35%	35%
Reducing travel costs	1	0	0	1	4%	100%	0%	0%
Relieving congestion	1	1	2	4	14%	25%	25%	50%
Impr. rel. of transport	0	0	3	3	11%	0%	0%	100%
Total	**8**	**8**	**12**	**28**	**100%**	**29%**	**29%**	**43%**

Table A.128 - Actual traffic vs forecasts with respect to Main project purpose for the Contracting Authority (Public)

Main project purpose for the Contracting Authority	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Reducing travel time	3	2	4	9	69%	33%	22%	44%
Reducing travel costs	0	0	0	0	0%	-	-	-
Relieving congestion	2	0	1	3	23%	67%	0%	33%
Impr. rel. of transport	0	0	1	1	8%	0%	0%	100%
Total	**5**	**2**	**6**	**13**	**100%**	**38%**	**15%**	**46%**

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Table A.129 - Actual traffic vs forecasts with respect to Design Risk Allocation (Total)

Design Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	10	11	17	38	73%	26%	29%	45%
Aggregate public	7	3	4	14	27%	50%	21%	29%
Total	**17**	**14**	**21**	**52**	**100%**	**33%**	**27%**	**40%**

Table A.130 - Actual traffic vs forecasts with respect to Design Risk Allocation (PPP)

Design Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	11	14	34	87%	26%	32%	41%
Aggregate public	1	1	3	5	13%	20%	20%	60%
Total	**10**	**12**	**17**	**39**	**100%**	**26%**	**31%**	**44%**

Table A.131 - Actual traffic vs forecasts with respect to Design Risk Allocation (Public)

Design Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	0	3	4	31%	25%	0%	75%
Aggregate public	6	2	1	9	69%	67%	22%	11%
Total	**7**	**2**	**4**	**13**	**100%**	**54%**	**15%**	**31%**

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Table A.132 - Actual traffic vs forecasts with respect to Construction Risk Allocation (Total)

Construction Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	13	14	20	47	89%	28%	30%	43%
Aggregate public	4	1	1	6	11%	67%	17%	17%
Total	**17**	**15**	**21**	**53**	**100%**	**32%**	**28%**	**40%**

Table A.133 - Actual traffic vs forecasts with respect to Construction Risk Allocation (PPP)

Construction Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	10	12	16	38	95%	26%	32%	42%
Aggregate public	0	1	1	2	5%	0%	50%	50%
Total	**10**	**13**	**17**	**40**	**100%**	**25%**	**33%**	**43%**

Table A.134 - Actual traffic vs forecasts with respect to Construction Risk Allocation (Public)

Construction Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	3	2	4	9	69%	33%	22%	44%
Aggregate public	4	0	0	4	31%	100%	0%	0%
Total	**7**	**2**	**4**	**13**	**100%**	**54%**	**15%**	**31%**

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Table A.135 - Actual traffic vs forecasts with respect to Maintenance Risk Allocation (Total)

Maintenance Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	13	14	19	46	85%	28%	30%	41%
Aggregate public	4	1	3	8	15%	50%	13%	38%
Total	**17**	**15**	**22**	**54**	**100%**	**31%**	**28%**	**41%**

Table A.136 - Actual traffic vs forecasts with respect to Maintenance Risk Allocation (PPP)

Maintenance Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	10	13	18	41	100%	24%	32%	44%
Aggregate public	0	0	0	0	0%	-	-	-
Total	**10**	**13**	**18**	**41**	**100%**	**24%**	**32%**	**44%**

Table A.137 - Actual traffic vs forecasts with respect to Maintenance Risk Allocation (Public)

Maintenance Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	3	1	1	5	38%	60%	20%	20%
Aggregate public	4	1	3	8	62%	50%	13%	38%
Total	**7**	**2**	**4**	**13**	**100%**	**54%**	**15%**	**31%**

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Table A.138 - Actual traffic vs forecasts with respect to Exploitation Risk Allocation (Total)

Exploitation Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	8	15	32	67%	28%	25%	47%
Aggregate public	5	6	5	16	33%	31%	38%	31%
Total	**14**	**14**	**20**	**48**	**100%**	**29%**	**29%**	**42%**

Table A.139 - Actual traffic vs forecasts with respect to Exploitation Risk Allocation (PPP)

Exploitation Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	8	8	15	31	82%	26%	26%	48%
Aggregate public	1	5	1	7	18%	14%	71%	14%
Total	**9**	**13**	**16**	**38**	**100%**	**24%**	**34%**	**42%**

Table A.140 - Actual traffic vs forecasts with respect to Exploitation Risk Allocation (Public)

Exploitation Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	0	0	1	10%	100%	0%	0%
Aggregate public	4	1	4	9	90%	44%	11%	44%
Total	**5**	**1**	**4**	**10**	**100%**	**50%**	**10%**	**40%**

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Table A.141 - Actual traffic vs forecasts with respect to Commercial/Revenue Risk Allocation (Total)

Commercial/Revenue Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	11	7	15	33	55%	33%	21%	45%
Aggregate public	8	9	10	27	45%	30%	33%	37%
Total	**19**	**16**	**25**	**60**	**100%**	**32%**	**27%**	**42%**

Table A.142 - Actual traffic vs forecasts with respect to Commercial/Revenue Risk Allocation (PPP)

Commercial/Revenue Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	7	15	31	72%	29%	23%	48%
Aggregate public	2	6	4	12	28%	17%	50%	33%
Total	**11**	**13**	**19**	**43**	**100%**	**26%**	**30%**	**44%**

Table A.143 - Actual traffic vs forecasts with respect to Commercial/Revenue Risk Allocation (Public)

Commercial/Revenue Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	0	0	2	12%	100%	0%	0%
Aggregate public	6	3	6	15	88%	40%	20%	40%
Total	**8**	**3**	**6**	**17**	**100%**	**47%**	**18%**	**35%**

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Table A.144 - Actual traffic vs forecasts with respect to Financial Risk Allocation (Total)

Financial Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	12	16	37	74%	24%	32%	43%
Aggregate public	8	2	3	13	26%	62%	15%	23%
Total	**17**	**14**	**19**	**50**	**100%**	**34%**	**28%**	**38%**

Table A.145 - Actual traffic vs forecasts with respect to Financial Risk Allocation (PPP)

Financial Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	12	16	37	93%	24%	32%	43%
Aggregate public	1	1	1	3	8%	33%	33%	33%
Total	**10**	**13**	**17**	**40**	**100%**	**25%**	**33%**	**43%**

Table A.146 - Actual traffic vs forecasts with respect to Financial Risk Allocation (Public)

Financial Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	0	0	0%	-	-	-
Aggregate public	7	1	2	10	100%	70%	10%	20%
Total	**7**	**1**	**2**	**10**	**100%**	**70%**	**10%**	**20%**

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Table A.147 - Actual traffic vs forecasts with respect to Regulatory Risk Allocation (Total)

Regulatory Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	1	2	4	8%	25%	25%	50%
Aggregate public	15	13	18	46	92%	33%	28%	39%
Total	**16**	**14**	**20**	**50**	**100%**	**32%**	**28%**	**40%**

Table A.148 - Actual traffic vs forecasts with respect to Regulatory Risk Allocation (PPP)

Regulatory Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	1	2	4	11%	25%	25%	50%
Aggregate public	9	11	14	34	89%	26%	32%	41%
Total	**10**	**12**	**16**	**38**	**100%**	**26%**	**32%**	**42%**

Table A.149 - Actual traffic vs forecasts with respect to Regulatory Risk Allocation (Public)

Regulatory Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	0	0	0%	-	-	-
Aggregate public	6	2	4	12	100%	50%	17%	33%
Total	**6**	**2**	**4**	**12**	**100%**	**50%**	**17%**	**33%**

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Table A.150 - Actual traffic vs forecasts with respect to Force majeure Risk Allocation (Total)

Force majeure Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	3	3	5	11	22%	27%	27%	45%
Aggregate public	11	11	16	38	78%	29%	29%	42%
Total	**14**	**14**	**21**	**49**	**100%**	**29%**	**29%**	**43%**

Table A.151 - Actual traffic vs forecasts with respect to Force majeure Risk Allocation (PPP)

Force majeure Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	3	3	5	11	28%	27%	27%	45%
Aggregate public	7	9	12	28	72%	25%	32%	43%
Total	**10**	**12**	**17**	**39**	**100%**	**26%**	**31%**	**44%**

Table A.152 - Actual traffic vs forecasts with respect to Force majeure Risk Allocation (Public)

Force majeure Risk Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	0	0	0%	-	-	-
Aggregate public	4	2	4	10	100%	40%	20%	40%
Total	**4**	**2**	**4**	**10**	**100%**	**40%**	**20%**	**40%**

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Table A.153 - Actual traffic vs forecasts with respect to Other Risk Specific Allocation (Total)

Other Risk Specific Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	2	3	6	24%	17%	33%	50%
Aggregate public	7	2	10	19	76%	37%	11%	53%
Total	**8**	**4**	**13**	**25**	**100%**	**32%**	**16%**	**52%**

Table A.154 - Actual traffic vs forecasts with respect to Other Risk Specific Allocation (PPP)

Other Risk Specific Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	2	2	5	25%	20%	40%	40%
Aggregate public	6	1	8	15	75%	40%	7%	53%
Total	**7**	**3**	**10**	**20**	**100%**	**35%**	**15%**	**50%**

Table A.155 - Actual traffic vs forecasts with respect to Other Risk Specific Allocation (Public)

Other Risk Specific Allocation	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	1	1	20%	0%	0%	100%
Aggregate public	1	1	2	4	80%	25%	25%	50%
Total	**1**	**1**	**3**	**5**	**100%**	**20%**	**20%**	**60%**

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Table A.156 - Actual traffic vs forecasts with respect to Project maturity - Time between Tender call and Date project conceived (Total)

Project maturity - Time between Tender call and Date project conceived (range in years)	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	7	8	6	21	57%	33%	38%	29%
5-10	2	2	5	9	24%	22%	22%	56%
over 10	3	0	4	7	19%	43%	0%	57%
Total	**12**	**10**	**15**	**37**	**100%**	**32%**	**27%**	**41%**

Table A.157 - Actual traffic vs forecasts with respect to Project maturity - Time between Tender call and Date project conceived (PPP)

Project maturity - Time between Tender call and Date project conceived (range in years)	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	5	7	3	15	50%	33%	47%	20%
5-10	1	2	5	8	27%	13%	25%	63%
over 10	3	0	4	7	23%	43%	0%	57%
Total	**9**	**9**	**12**	**30**	**100%**	**30%**	**30%**	**40%**

Table A.158 - Actual traffic vs forecasts with respect to Project maturity - Time between Tender call and Date project conceived (PPP)

Project maturity - Time between Tender call and Date project conceived (range in years)	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	2	1	3	6	86%	33%	17%	50%
5-10	1	0	0	1	14%	100%	0%	0%
over 10	0	0	0	0	0%	-	-	-
Total	**3**	**1**	**3**	**7**	**100%**	**43%**	**14%**	**43%**

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Table A.159 - Actual traffic vs forecasts with respect to Procurement - "Financing" (Operation & Maintenance Structure) (Total)

Procurement - "Financing" (Operation & Maintenance Structure)	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	4	2	1	7	37%	57%	29%	14%
Users	3	0	2	5	26%	60%	0%	40%
Mixed	3	1	3	7	37%	43%	14%	43%
Total	**10**	**3**	**6**	**19**	**100%**	**53%**	**16%**	**32%**

Table A.160 - Actual traffic vs forecasts with respect to Procurement - "Financing" (Operation & Maintenance Structure) (PPP)

Procurement - "Financing" (Operation & Maintenance Structure)	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	0	0	0	0	-	-	-	-
Users	0	0	0	0	-	-	-	-
Mixed	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.161 - Actual traffic vs forecasts with respect to Procurement - "Financing" (Operation & Maintenance Structure) (Public)

Procurement - "Financing" (Operation & Maintenance Structure)	Actual traffic vs forecasts							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	4	2	1	7	37%	57%	29%	14%
Users	3	0	2	5	26%	60%	0%	40%
Mixed	3	1	3	7	37%	43%	14%	43%
Total	**10**	**3**	**6**	**19**	**100%**	**53%**	**16%**	**32%**

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A.3.3 Delay in completion of works/opening of operation

Table A.162 - Delay in completion of works/opening of operation with respect to Field (Total)

Field	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	4	4	0	8	18%	50%	50%	0%
Greenfield	4	11	2	17	38%	24%	65%	12%
Both	6	14	0	20	44%	30%	70%	0%
Total	**14**	**29**	**2**	**45**	**100%**	**31%**	**64%**	**4%**

Table A.163 - Delay in completion of works/opening of operation with respect to Field (PPP)

Field	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	0	3	0	3	10%	0%	100%	0%
Greenfield	3	9	2	14	47%	21%	64%	14%
Both	5	8	0	13	43%	38%	62%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.164 - Delay in completion of works/opening of operation with respect to Field (Public)

Field	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Brownfield	4	1	0	5	33%	80%	20%	0%
Greenfield	1	2	0	3	20%	33%	67%	0%
Both	1	6	0	7	47%	14%	86%	0%
Total	**6**	**9**	**0**	**15**	**100%**	**40%**	**60%**	**0%**

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Table A.165 - Delay in completion of works/opening of operation with respect to Principal transport mode infrastructure (Total)

Principal transport mode infrastructure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	6	13	2	21	47%	29%	62%	10%
Others	8	16	0	24	53%	33%	67%	0%
Total	**14**	**29**	**2**	**45**	**100%**	**31%**	**64%**	**4%**

Table A.166 - Delay in completion of works/opening of operation with respect to Principal transport mode infrastructure (PPP)

Principal transport mode infrastructure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	4	10	2	16	53%	25%	63%	13%
Others	4	10	0	14	47%	29%	71%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.167 - Delay in completion of works/opening of operation with respect to Principal transport mode infrastructure (Public)

Principal transport mode infrastructure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Road	2	3	0	5	33%	40%	60%	0%
Others	4	6	0	10	67%	40%	60%	0%
Total	**6**	**9**	**0**	**15**	**100%**	**40%**	**60%**	**0%**

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Table A.168 - Delay in completion of works/opening of operation with respect to Project size (Total)

Project size [million €]	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	2	3	0	5	11%	40%	60%	0%
100-500	6	11	0	17	38%	35%	65%	0%
500-1.000	3	9	0	12	27%	25%	75%	0%
higher than 1.000	3	6	2	11	24%	27%	55%	18%
Total	**14**	**29**	**2**	**45**	**0%**	**31%**	**64%**	**4%**

Table A.169 - Delay in completion of works/opening of operation with respect to Project size (PPP)

Project size [million €]	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	0	3	0	3	10%	0%	100%	0%
100-500	3	6	0	9	30%	33%	67%	0%
500-1.000	3	7	0	10	33%	30%	70%	0%
higher than 1.000	2	4	2	8	27%	25%	50%	25%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.170 - Delay in completion of works/opening of operation with respect to Project size (Public)

Project size [million €]	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
lower than 100	2	0	0	2	13%	100%	0%	0%
100-500	3	5	0	8	53%	38%	63%	0%
500-1.000	0	2	0	2	13%	0%	100%	0%
higher than 1.000	1	2	0	3	20%	33%	67%	0%
Total	**6**	**9**	**0**	**15**	**100%**	**40%**	**60%**	**0%**

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Table A.171 - Delay in completion of works/opening of operation with respect to Level of Project Exclusivity (Euro2013) (Total)

Level of Project Exclusivity	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	3	10	0	13	29%	23%	77%	0%
Aggregate Exclusive	11	19	2	32	71%	34%	59%	6%
Total	**14**	**29**	**2**	**45**	**100%**	**31%**	**64%**	**4%**

Table A.172 - Delay in completion of works/opening of operation with respect to Level of Project Exclusivity (Euro2013) (PPP)

Level of Project Exclusivity	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	1	8	0	9	30%	11%	89%	0%
Aggregate Exclusive	7	12	2	21	70%	33%	57%	10%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.173 - Delay in completion of works/opening of operation with respect to Level of Project Exclusivity (Euro2013) (Public)

Level of Project Exclusivity	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate Competitive	2	2	0	4	27%	50%	50%	0%
Aggregate Exclusive	4	7	0	11	73%	36%	64%	0%
Total	**6**	**9**	**0**	**15**	**100%**	**40%**	**60%**	**0%**

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Table A.174 - Delay in completion of works/opening of operation with respect to Physical description in terms of network (Total)

Physical description in terms of network	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	1	2	0	3	7%	33%	67%	0%
Link within a Link	0	4	1	5	11%	0%	80%	20%
Node	5	4	0	9	20%	56%	44%	0%
Link	8	18	1	27	61%	30%	67%	4%
Total	**14**	**28**	**2**	**44**	**100%**	**32%**	**64%**	**5%**

Table A.175 - Delay in completion of works/opening of operation with respect to Physical description in terms of network (PPP)

Physical description in terms of network	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	1	2	0	3	10%	33%	67%	0%
Link within a Link	0	3	1	4	14%	0%	75%	25%
Node	1	4	0	5	17%	20%	80%	0%
Link	6	10	1	17	59%	35%	59%	6%
Total	**8**	**19**	**2**	**29**	**100%**	**28%**	**66%**	**7%**

Table A.176 - Delay in completion of works/opening of operation with respect to Physical description in terms of network (Public)

Physical description in terms of network	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Node within a Node	0	0	0	0	0%	-	-	-
Link within a Link	0	1	0	1	7%	0%	100%	0%
Node	4	0	0	4	27%	100%	0%	0%
Link	2	8	0	10	67%	20%	80%	0%
Total	**6**	**9**	**0**	**15**	**100%**	**40%**	**60%**	**0%**

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Table A.177 - Delay in completion of works/opening of operation with respect to Ratio of civil structures (eg. Bridges, tunnels, etc.) (Total)

Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-25	5	8	0	13	43%	38%	62%	0%
26-50	4	5	0	9	30%	44%	56%	0%
51-100	3	4	1	8	27%	38%	50%	13%
Total	**12**	**17**	**1**	**30**	**100%**	**40%**	**57%**	**3%**

Table A.178 - Delay in completion of works/opening of operation with respect to Ratio of civil structures (eg. Bridges, tunnels, etc.) (PPP)

Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-25	2	6	0	8	40%	25%	75%	0%
26-50	3	3	0	6	30%	50%	50%	0%
51-100	2	3	1	6	30%	33%	50%	17%
Total	**7**	**12**	**1**	**20**	**100%**	**35%**	**60%**	**5%**

Table A.179 - Delay in completion of works/opening of operation with respect to Ratio of civil structures (eg. Bridges, tunnels, etc.) (Public)

Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-25	3	2	0	5	50%	60%	40%	0%
26-50	1	2	0	3	30%	33%	67%	0%
51-100	1	1	0	2	20%	50%	50%	0%
Total	**5**	**5**	**0**	**10**	**100%**	**50%**	**50%**	**0%**

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Table A.180 - Delay in completion of works/opening of operation with respect to Type of users (Total)

Type of users	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	1	4	0	5	11%	20%	80%	0%
Only pass./ind. users	3	8	0	11	24%	27%	73%	0%
Mix use (freight/pass.)	9	17	2	28	62%	32%	61%	7%
Non-transport users	1	0	0	1	2%	100%	0%	0%
Total	**14**	**29**	**2**	**45**	**100%**	**31%**	**64%**	**4%**

Table A.181 - Delay in completion of works/opening of operation with respect to Type of users (PPP)

Type of users	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	1	4	0	5	17%	20%	80%	0%
Only pass./ind. users	2	3	0	5	17%	40%	60%	0%
Mix use (freight/pass.)	4	13	2	19	63%	21%	68%	11%
Non-transport users	1	0	0	1	3%	100%	0%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.182 - Delay in completion of works/opening of operation with respect to Type of users (Public)

Type of users	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Only freight/cargo	0	0	0	0	0%	-	-	-
Only pass./ind. users	1	5	0	6	40%	17%	83%	0%
Mix use (freight/pass.)	5	4	0	9	60%	56%	44%	0%
Non-transport users	0	0	0	0	0%	-	-	-
Total	**6**	**9**	**0**	**15**	**100%**	**40%**	**60%**	**0%**

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Table A.183 - Delay in completion of works/opening of operation with respect to Project Locality (Total)

Project Locality	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	3	10	0	13	29%	23%	77%	0%
Outer urban	2	5	0	7	16%	29%	71%	0%
Inter-urban	4	4	1	9	20%	44%	44%	11%
Regional	1	9	0	10	22%	10%	90%	0%
Rural	0	0	1	1	2%	0%	0%	100%
Cross Border	0	0	0	0	0%	-	-	-
International	4	1	0	4	11%	80%	20%	0%
Total	**14**	**29**	**2**	**45**	**100%**	**31%**	**64%**	**4%**

Table A.184 - Delay in completion of works/opening of operation with respect to Project Locality (PPP)

Project Locality	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	2	6	0	8	27%	25%	75%	0%
Outer urban	0	5	0	5	17%	0%	100%	0%
Inter-urban	3	2	1	6	20%	50%	33%	17%
Regional	0	6	0	6	20%	0%	100%	0%
Rural	0	0	1	1	3%	0%	0%	100%
Cross Border	0	0	0	0	0%	-	-	-
International	3	1	0	4	13%	75%	25%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

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Table A.185 - Delay in completion of works/opening of operation with respect to Project Locality (Public)

Project Locality	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Urban	1	4	0	5	33%	20%	80%	0%
Outer urban	2	0	0	2	13%	100%	0%	0%
Inter-urban	1	2	0	3	20%	33%	67%	0%
Regional	1	3	0	4	27%	25%	75%	0%
Rural	0	0	0	0	0%	-	-	-
Cross Border	0	0	0	0	0%	-	-	-
International	1	0	0	1	7%	100%	0%	0%
Total	**6**	**9**	**0**	**15**	**100%**	**40%**	**60%**	**0%**

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Table A.186 - Delay in completion of works/opening of operation with respect to Type of expected repayment revenues during the operating phase (Total)

Type of expected repayment revenues during the operating phase	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	1	6	1	8	19%	13%	75%	13%
All other forms	12	21	1	34	81%	35%	62%	3%
Total	**13**	**27**	**2**	**42**	**100%**	**31%**	**64%**	**5%**

Table A.187 - Delay in completion of works/opening of operation with respect to Type of expected repayment revenues during the operating phase (PPP)

Type of expected repayment revenues during the operating phase	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	0	6	1	7	23%	0%	86%	14%
All other forms	8	14	1	23	77%	35%	61%	4%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.188 - Delay in completion of works/opening of operation with respect to Type of expected repayment revenues during the operating phase (Public)

Type of expected repayment revenues during the operating phase	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
User charges	1	0	0	1	8%	100%	0%	0%
All other forms	4	7	0	11	92%	36%	64%	0%
Total	**5**	**7**	**0**	**12**	**100%**	**42%**	**58%**	**0%**

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Table A.189 - Delay in completion of works/opening of operation with respect to Main project purpose for the Contracting Authority (Total)

Main project purpose for the Contracting Authority	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Reducing travel time + Relieving congestion	10	13	1	24	69%	42%	54%	4%
Reducing travel costs	0	1	0	1	3%	0%	100%	0%
Impr. rel. of transport	1	6	0	7	20%	14%	86%	0%
Impr. saf. of transport	1	2	0	3	9%	33%	67%	0%
Total	**12**	**22**	**1**	**35**	**100%**	**34%**	**63%**	**3%**

Table A.190 - Delay in completion of works/opening of operation with respect to Main project purpose for the Contracting Authority (PPP)

Main project purpose for the Contracting Authority	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Reducing travel time + Relieving congestion	4	9	1	14	67%	29%	64%	7%
Reducing travel costs	0	1	0	1	5%	0%	100%	0%
Impr. rel. of transport	1	3	0	4	19%	25%	75%	0%
Impr. saf. of transport	1	1	0	2	10%	50%	50%	0%
Total	**6**	**14**	**1**	**21**	**100%**	**29%**	**67%**	**5%**

Table A.191 - Delay in completion of works/opening of operation with respect to Main project purpose for the Contracting Authority (Public)

Main project purpose for the Contracting Authority	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Reducing travel time + Relieving congestion	6	4	0	10	71%	60%	40%	0%
Reducing travel costs	0	0	0	0	0%	-	-	-
Impr. rel. of transport	0	3	0	3	21%	0%	100%	0%

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Impr. saf. of transport	0	1	0	1	7%	0%	100%	0%
Total	**6**	**8**	**0**	**14**	**100%**	**43%**	**57%**	**0%**

Table A.192 - Delay in completion of works/opening of operation with respect to Design Risk Allocation (Total)

Design Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	19	2	30	77%	30%	63%	7%
Aggregate public	3	6	0	9	23%	33%	67%	0%
Total	**12**	**25**	**2**	**39**	**100%**	**31%**	**64%**	**5%**

Table A.193 - Delay in completion of works/opening of operation with respect to Design Risk Allocation (PPP)

Design Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	8	16	2	26	93%	31%	62%	8%
Aggregate public	0	2	0	2	7%	0%	100%	0%
Total	**8**	**18**	**2**	**28**	**100%**	**29%**	**64%**	**7%**

Table A.194 - Delay in completion of works/opening of operation with respect to Design Risk Allocation (Public)

Design Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	3	0	4	36%	25%	75%	0%
Aggregate public	3	4	0	7	64%	43%	57%	0%
Total	**4**	**7**	**0**	**11**	**100%**	**36%**	**64%**	**0%**

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Table A.195 - Delay in completion of works/opening of operation with respect to Construction Risk Allocation (Total)

Construction Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	11	22	2	35	90%	31%	63%	6%
Aggregate public	1	3	0	4	10%	25%	75%	0%
Total	**12**	**25**	**2**	**39**	**100%**	**31%**	**64%**	**5%**

Table A.196 - Delay in completion of works/opening of operation with respect to Construction Risk Allocation (PPP)

Construction Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	8	17	2	27	96%	30%	63%	7%
Aggregate public	0	1	0	1	4%	0%	100%	0%
Total	**8**	**18**	**2**	**28**	**100%**	**29%**	**64%**	**7%**

Table A.197 - Delay in completion of works/opening of operation with respect to Construction Risk Allocation (Public)

Construction Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	3	5	0	8	73%	38%	63%	0%
Aggregate public	1	2	0	3	27%	33%	67%	0%
Total	**4**	**7**	**0**	**11**	**100%**	**36%**	**64%**	**0%**

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Table A.198 - Delay in completion of works/opening of operation with respect to Maintenance Risk Allocation (Total)

Maintenance Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded forecast	In line with forecast	Below and far forecast
Aggregate contractor	9	20	2	31	79%	29%	65%	6%
Aggregate public	3	5	0	8	21%	38%	63%	0%
Total	**12**	**25**	**2**	**39**	**100%**	**31%**	**64%**	**5%**

Table A.199 - Delay in completion of works/opening of operation with respect to Maintenance Risk Allocation (PPP)

Maintenance Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded forecast	In line with forecast	Below and far forecast
Aggregate contractor	8	18	2	28	100%	29%	64%	7%
Aggregate public	0	0	0	0	0%	-	-	-
Total	**8**	**18**	**2**	**28**	**100%**	**29%**	**64%**	**7%**

Table A.200 - Delay in completion of works/opening of operation with respect to Maintenance Risk Allocation (Public)

Maintenance Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	2	0	3	27%	33%	67%	0%
Aggregate public	3	5	0	8	73%	38%	63%	0%
Total	**4**	**7**	**0**	**11**	**100%**	**36%**	**64%**	**0%**

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Table A.201 - Delay in completion of works/opening of operation with respect to Exploitation Risk Allocation (Total)

Exploitation Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	8	13	2	23	66%	35%	57%	9%
Aggregate public	3	9	0	12	34%	25%	75%	0%
Total	**11**	**22**	**2**	**35**	**100%**	**31%**	**63%**	**6%**

Table A.202 - Delay in completion of works/opening of operation with respect to Exploitation Risk Allocation (PPP)

Exploitation Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	7	12	2	21	78%	33%	57%	10%
Aggregate public	1	5	0	6	22%	17%	83%	0%
Total	**8**	**17**	**2**	**27**	**100%**	**30%**	**63%**	**7%**

Table A.203 - Delay in completion of works/opening of operation with respect to Exploitation Risk Allocation (Public)

Exploitation Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	1	0	2	25%	50%	50%	0%
Aggregate public	2	4	0	6	75%	33%	67%	0%
Total	**3**	**5**	**0**	**8**	**100%**	**38%**	**63%**	**0%**

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Table A.204 - Delay in completion of works/opening of operation with respect to Commercial/Revenue Risk Allocation (Total)

Commercial/Revenue Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	8	17	1	26	59%	31%	65%	4%
Aggregate public	6	11	1	18	41%	33%	61%	6%
Total	**14**	**28**	**2**	**44**	**100%**	**32%**	**64%**	**5%**

Table A.205 - Delay in completion of works/opening of operation with respect to Commercial/Revenue Risk Allocation (PPP)

Commercial/Revenue Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	7	16	1	24	80%	29%	67%	4%
Aggregate public	1	4	1	6	20%	17%	67%	17%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.206 - Delay in completion of works/opening of operation with respect to Commercial/Revenue Risk Allocation (Public)

Commercial/Revenue Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	1	0	2	14%	50%	50%	0%
Aggregate public	5	7	0	12	86%	42%	58%	0%
Total	**6**	**8**	**0**	**14**	**100%**	**43%**	**57%**	**0%**

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Table A.207 - Delay in completion of works/opening of operation with respect to Financial Risk Allocation (Total)

Financial Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	9	16	2	27	75%	33%	59%	7%
Aggregate public	2	7	0	9	25%	22%	78%	0%
Total	**11**	**23**	**2**	**36**	**100%**	**31%**	**64%**	**6%**

Table A.208 - Delay in completion of works/opening of operation with respect to Financial Risk Allocation (PPP)

Financial Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	8	16	2	26	93%	31%	62%	8%
Aggregate public	0	2	0	2	7%	0%	100%	0%
Total	**8**	**18**	**2**	**28**	**100%**	**29%**	**64%**	**7%**

Table A.209 - Delay in completion of works/opening of operation with respect to Financial Risk Allocation (Public)

Financial Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	1	0	0	1	13%	100%	0%	0%
Aggregate public	2	5	0	7	88%	29%	71%	0%
Total	**3**	**5**	**0**	**8**	**100%**	**38%**	**63%**	**0%**

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Table A.210 - Delay in completion of works/opening of operation with respect to Regulatory Risk Allocation (Total)

Regulatory Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	2	0	4	11%	50%	50%	0%
Aggregate public	10	21	2	33	89%	30%	64%	6%
Total	**12**	**23**	**2**	**37**	**100%**	**32%**	**62%**	**5%**

Table A.211 - Delay in completion of works/opening of operation with respect to Regulatory Risk Allocation (PPP)

Regulatory Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	2	0	4	15%	50%	50%	0%
Aggregate public	6	15	2	23	85%	26%	65%	9%
Total	**8**	**17**	**2**	**27**	**100%**	**30%**	**63%**	**7%**

Table A.212 - Delay in completion of works/opening of operation with respect to Regulatory Risk Allocation (Public)

Regulatory Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	0	0	0	0%	-	-	-
Aggregate public	4	6	0	10	100%	40%	60%	0%
Total	**4**	**6**	**0**	**10**	**100%**	**40%**	**60%**	**0%**

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Table A.213 - Delay in completion of works/opening of operation with respect to Force majeure Risk Allocation (Total)

Force majeure Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	8	1	11	29%	18%	73%	9%
Aggregate public	10	16	1	27	71%	37%	59%	4%
Total	**12**	**24**	**2**	**38**	**100%**	**32%**	**63%**	**5%**

Table A.214 - Delay in completion of works/opening of operation with respect to Force majeure Risk Allocation (PPP)

Force majeure Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	2	7	1	10	37%	20%	70%	10%
Aggregate public	6	10	1	17	63%	35%	59%	6%
Total	**8**	**17**	**2**	**27**	**100%**	**30%**	**63%**	**7%**

Table A.215 - Delay in completion of works/opening of operation with respect to Force majeure Risk Allocation (Public)

Force majeure Risk Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	1	0	1	9%	0%	100%	0%
Aggregate public	4	6	0	10	91%	40%	60%	0%
Total	**4**	**7**	**0**	**11**	**100%**	**36%**	**64%**	**0%**

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Table A.216 - Delay in completion of works/opening of operation with respect to Other Risk Specific Allocation (Total)

Other Risk Specific Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	5	0	5	24%	0%	100%	0%
Aggregate public	7	8	1	16	76%	44%	50%	6%
Total	**7**	**13**	**1**	**21**	**100%**	**33%**	**62%**	**5%**

Table A.217 - Delay in completion of works/opening of operation with respect to Other Risk Specific Allocation (PPP)

Other Risk Specific Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	4	0	4	25%	0%	100%	0%
Aggregate public	6	5	1	12	75%	50%	42%	8%
Total	**6**	**9**	**1**	**16**	**100%**	**38%**	**56%**	**6%**

Table A.218 - Delay in completion of works/opening of operation with respect to Other Risk Specific Allocation (Public)

Other Risk Specific Allocation	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Aggregate contractor	0	1	0	1	20%	0%	100%	0%
Aggregate public	1	3	0	4	80%	25%	75%	0%
Total	**1**	**4**	**0**	**5**	**100%**	**20%**	**80%**	**0%**

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Table A.219 - Delay in completion of works/opening of operation with respect to Project maturity - Time between Tender call and Date project conceived (Total)

Project maturity - Time between Tender call and Date project conceived	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	5	9	2	16	57%	31%	56%	13%
5-10	3	4	0	7	25%	43%	57%	0%
over 10	0	5	0	5	18%	0%	100%	0%
Total	**8**	**18**	**2**	**28**	**100%**	**29%**	**64%**	**7%**

Table A.220 - Delay in completion of works/opening of operation with respect to Project maturity - Time between Tender call and Date project conceived (PPP)

Project maturity - Time between Tender call and Date project conceived	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	3	7	2	12	50%	25%	58%	17%
5-10	3	4	0	7	29%	43%	57%	0%
over 10	0	5	0	5	21%	0%	100%	0%
Total	**6**	**16**	**2**	**24**	**100%**	**25%**	**67%**	**8%**

Table A.221 - Delay in completion of works/opening of operation with respect to Project maturity - Time between Tender call and Date project conceived (Public)

Project maturity - Time between Tender call and Date project conceived	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-5	2	2	0	4	17%	50%	50%	0%
5-10	0	0	0	0	0%	-	-	-
over 10	0	0	0	0	0%	-	-	-
Total	**2**	**2**	**0**	**4**	**100%**	**50%**	**50%**	**0%**

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Table A.222 - Delay in completion of works/opening of operation with respect to Project procurement - Time between tender call and project award (Total)

Project procurement - Time between tender call and project award	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-2	3	15	1	19	66%	16%	79%	5%
2-5	3	1	1	5	17%	60%	20%	20%
over 5	2	3	0	5	17%	40%	60%	0%
Total	**8**	**19**	**2**	**29**	**100%**	**28%**	**66%**	**7%**

Table A.223 - Delay in completion of works/opening of operation with respect to Project procurement - Time between tender call and project award (PPP)

Project procurement - Time between tender call and project award	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-2	2	13	1	16	64%	13%	81%	6%
2-5	2	1	1	4	16%	50%	25%	25%
over 5	2	3	0	5	20%	40%	60%	0%
Total	**6**	**17**	**2**	**25**	**100%**	**24%**	**68%**	**8%**

Table A.224 - Delay in completion of works/opening of operation with respect to Project procurement - Time between tender call and project award (Public)

Project procurement - Time between tender call and project award	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0-2	1	2	0	3	12%	33%	67%	0%
2-5	1	0	0	1	4%	100%	0%	0%
over 5	0	0	0	0	0%	-	-	-
Total	**2**	**2**	**0**	**4**	**100%**	**50%**	**50%**	**0%**

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Table A.225 - Delay in completion of works/opening of operation with respect to Procurement/tendering - Tendering - Complexity of the procedure (Total)

Procurement/tendering - Tendering - Complexity of the procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	5	11	1	17	63%	29%	65%	6%
Intermediate	1	5	1	7	26%	14%	71%	14%
High	2	1	0	3	11%	67%	33%	0%
Total	**8**	**17**	**2**	**27**	**100%**	**30%**	**63%**	**7%**

Table A.226 - Delay in completion of works/opening of operation with respect to Procurement/tendering - Tendering - Complexity of the procedure (PPP)

Procurement/tendering - Tendering - Complexity of the procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	5	11	1	17	63%	29%	65%	6%
Intermediate	1	5	1	7	26%	14%	71%	14%
High	2	1	0	3	11%	67%	33%	0%
Total	**8**	**17**	**2**	**27**	**100%**	**30%**	**63%**	**7%**

Table A.227 - Delay in completion of works/opening of operation with respect to Procurement/tendering - Tendering - Complexity of the procedure (Public)

Procurement/tendering - Tendering - Complexity of the procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	0	0	0	0	-	-	-	-
Intermediate	0	0	0	0	-	-	-	-
High	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.228 - Delay in completion of works/opening of operation with respect to Procurement/tendering – Range Number of bidders in final stage (Total)

Procurement/tendering - Range Number of bidders in final stage	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	1	8	0	9	30%	11%	89%	0%
1-3	3	7	1	11	37%	27%	64%	9%
over 3	4	5	1	10	33%	40%	50%	10%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.229 - Delay in completion of works/opening of operation with respect to Procurement/tendering – Range Number of bidders in final stage (PPP)

Procurement/tendering - Range Number of bidders in final stage	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	1	8	0	9	30%	11%	89%	0%
1-3	3	7	1	11	37%	27%	64%	9%
over 3	4	5	1	10	33%	40%	50%	10%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.230 - Delay in completion of works/opening of operation with respect to Procurement/tendering – Range Number of bidders in final stage (Public)

Procurement/tendering - Range Number of bidders in final stage	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	0	0	0	-	-	-	-
1-3	0	0	0	0	-	-	-	-
over 3	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.231 - Delay in completion of works/opening of operation with respect to Range Maximum of Bidders in negotiations and bidders in final stage (Total)

Range Maximum of Bidders in negotiations and bidders in final stage	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	3	0	3	10%	0%	100%	0%
1-3	5	16	2	23	77%	22%	70%	9%
over 3	3	1	0	4	13%	75%	25%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.232 - Delay in completion of works/opening of operation with respect to Range Maximum of Bidders in negotiations and bidders in final stage (PPP)

Range Maximum of Bidders in negotiations and bidders in final stage	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	3	0	3	10%	0%	100%	0%
1-3	5	16	2	23	77%	22%	70%	9%
over 3	3	1	0	4	13%	75%	25%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.233 - Delay in completion of works/opening of operation with respect to Range Maximum of Bidders in negotiations and bidders in final stage (Public)

Range Maximum of Bidders in negotiations and bidders in final stage	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	0	0	0	-	-	-	-
1-3	0	0	0	0	-	-	-	-
over 3	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.234 - Delay in completion of works/opening of operation with respect to Procurement/tendering - Range Duration of project assignment procedure (Total)

Procurement/tendering - Range Duration of project assignment procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	2	10	2	14	47%	14%	71%	14%
1-3	3	9	0	12	40%	25%	75%	0%
over 3	3	1	0	4	13%	75%	25%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.235 - Delay in completion of works/opening of operation with respect to Procurement/tendering - Range Duration of project assignment procedure (years) (PPP)

Procurement/tendering - Range Duration of project assignment procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	2	10	2	14	47%	14%	71%	14%
1-3	3	9	0	12	40%	25%	75%	0%
over 3	3	1	0	4	13%	75%	25%	0%
Total	**8**	**20**	**2**	**30**	**100%**	**27%**	**67%**	**7%**

Table A.236 - Delay in completion of works/opening of operation with respect to Procurement/tendering - Range Duration of project assignment procedure (years) (Public)

Procurement/tendering - Range Duration of project assignment procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
0	0	0	0	0	-	-	-	-
1-3	0	0	0	0	-	-	-	-
over 3	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.237 - Delay in completion of works/opening of operation with respect to Procurement - Delivery (Construction) (Total)

Procurement - Delivery (Construction)	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Design - Build	1	3	0	4	31%	25%	75%	0%
Design Bid Build	3	6	0	9	69%	33%	67%	0%
Total	**4**	**9**	**0**	**13**	**100%**	**31%**	**69%**	**0%**

Table A.238 - Delay in completion of works/opening of operation with respect to Procurement - Delivery (Construction) (PPP)

Procurement - Delivery (Construction)	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Design - Build	0	0	0	0	-	-	-	-
Design Bid Build	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.239 - Delay in completion of works/opening of operation with respect to Procurement - Delivery (Construction) (Public)

Procurement - Delivery (Construction)	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Design - Build	1	3	0	4	31%	25%	75%	0%
Design Bid Build	3	6	0	9	69%	33%	67%	0%
Total	**4**	**9**	**0**	**13**	**100%**	**31%**	**69%**	**0%**

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Table A.240 - Delay in completion of works/opening of operation with respect to Procurement - "Financing" (Construction) Structure (Total)

Procurement - "Financing" (Construction) Structure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	2	6	0	8	57%	25%	75%	0%
PF and others	3	3	0	6	43%	50%	50%	0%
Total	**5**	**9**	**0**	**14**	**100%**	**36%**	**64%**	**0%**

Table A.241 - Delay in completion of works/opening of operation with respect to Procurement - "Financing" (Construction) Structure (PPP)

Procurement - "Financing" (Construction) Structure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	0	0	0	0	-	-	-	-
PF and others	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.242 - Delay in completion of works/opening of operation with respect to Procurement - "Financing" (Construction) Structure (Public)

Procurement - "Financing" (Construction) Structure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
PF	2	6	0	8	57%	25%	75%	0%
PF and others	3	3	0	6	43%	50%	50%	0%
Total	**5**	**9**	**0**	**14**	**100%**	**36%**	**64%**	**0%**

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Table A.243 - Delay in completion of works/opening of operation with respect to Tendering Construction - Tendering - Complexity of the procedure (Total)

Tendering Construction - Tendering - Complexity of the procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	4	4	0	8	73%	50%	50%	0%
Intermediate	0	2	0	2	18%	0%	100%	0%
High	1	0	0	1	9%	100%	0%	0%
Total	**5**	**6**	**0**	**11**	**100%**	**45%**	**55%**	**0%**

Table A.244 - Delay in completion of works/opening of operation with respect to Tendering Construction - Tendering - Complexity of the procedure (PPP)

Tendering Construction - Tendering - Complexity of the procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	0	0	0	0	-	-	-	-
Intermediate	0	0	0	0	-	-	-	-
High	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.245 - Delay in completion of works/opening of operation with respect to Tendering Construction - Tendering - Complexity of the procedure (Public)

Tendering Construction - Tendering - Complexity of the procedure	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Low	4	4	0	8	73%	50%	50%	0%
Intermediate	0	2	0	2	18%	0%	100%	0%
High	1	0	0	1	9%	100%	0%	0%
Total	**5**	**6**	**0**	**11**	**100%**	**45%**	**55%**	**0%**

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Table A.246 - Delay in completion of works/opening of operation with respect to Construction contract - Contract Type (Total)

Construction contract - Contract Type	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Lump Sum	4	4	0	8	62%	50%	50%	0%
Unit Cost	1	4	0	5	38%	20%	80%	0%
Turn Key	0	0	0	0	0%	-	-	-
Total	**5**	**8**	**0**	**13**	**100%**	**38%**	**62%**	**0%**

Table A.247 - Delay in completion of works/opening of operation with respect to Construction contract - Contract Type (PPP)

Construction contract - Contract Type	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Lump Sum	0	0	0	0	-	-	-	-
Unit Cost	0	0	0	0	-	-	-	-
Turn Key	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

Table A.248 - Delay in completion of works/opening of operation with respect to Construction contract - Contract Type (Public)

Construction contract - Contract Type	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Lump Sum	4	4	0	8	62%	50%	50%	0%
Unit Cost	1	4	0	5	38%	20%	80%	0%
Turn Key	0	0	0	0	0%	-	-	-
Total	**5**	**8**	**0**	**13**	**100%**	**38%**	**62%**	**0%**

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Table A.249 - Delay in completion of works/opening of operation with respect to Contract - Overlaps (Total)

Contract - Overlaps	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
D	0	3	0	3	14%	0%	100%	0%
F	2	1	1	4	18%	50%	25%	25%
Mixed	6	5	0	11	50%	55%	45%	0%
No	0	4	0	4	18%	0%	100%	0%
Total	**8**	**13**	**1**	**22**	**100%**	**36%**	**59%**	**5%**

Table A.250 - Delay in completion of works/opening of operation with respect to Contract - Overlaps (PPP)

Contract - Overlaps	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
D	0	3	0	3	14%	0%	100%	0%
F	2	1	1	4	18%	50%	25%	25%
Mixed	6	5	0	11	50%	55%	45%	0%
No	0	4	0	4	18%	0%	100%	0%
Total	**8**	**13**	**1**	**22**	**100%**	**36%**	**59%**	**5%**

Table A.251 - Delay in completion of works/opening of operation with respect to Contract - Overlaps (Public)

Contract - Overlaps	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
D	0	0	0	0	-	-	-	-
F	0	0	0	0	-	-	-	-
Mixed	0	0	0	0	-	-	-	-
No	0	0	0	0	-	-	-	-
Total	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**

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Table A.252 - Delay in completion of works/opening of operation with respect to Delay in beginning of works (Total)

Delay in beginning of works	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Exceeded	3	0	1	4	11%	75%	0%	25%
In line with	8	22	1	31	89%	26%	71%	3%
Below and far below	0	0	0	0	0%	-	-	-
Total	**11**	**22**	**2**	**35**	**100%**	**31%**	**63%**	**6%**

Table A.253 - Delay in completion of works/opening of operation with respect to Delay in beginning of works (PPP)

Delay in beginning of works	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Exceeded	2	0	1	3	14%	67%	0%	33%
In line with	4	13	1	18	86%	22%	72%	6%
Below and far below	0	0	0	0	0%	-	-	-
Total	**6**	**13**	**2**	**21**	**100%**	**29%**	**62%**	**10%**

Table A.254 - Delay in completion of works/opening of operation with respect to Delay in beginning of works (Public)

Delay in beginning of works	Delay in completion of works/opening of operation							
	Absolute values					Shares		
	Exceeded	In line	Below and far below	Total	[%]	Exceeded	In line	Below and far below
Exceeded	1	0	0	1	7%	100%	0%	0%
In line with	4	9	0	13	93%	31%	69%	0%
Below and far below	0	0	0	0	0%	-	-	-
Total	**5**	**9**	**0**	**14**	**100%**	**36%**	**64%**	**0%**

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A.4 Descriptive Statistics analysis of BENEFIT cases database – A fourth level of analysis

Chapter 5 anticipated and discussed on the possibility to extend the methodology designed to carry out the Descriptive Statistics analysis. Such further level of analysis mainly consists in analysing the influence of the three outcomes variables simultaneously and investigating the overall performance through a synthetic indicator summarising the various aspects investigated at the third level.

One might wonder whether an influencing variable affecting one outcome is influential also for the other outcome variables. If an influencing variable appears to have always a positive, or a negative, effect on the outcomes, it can be readily assumed that this feature has a positive, or negative, influence in general.

However, it might be the case that the role of some features is much less recognisable. For instance, one might be strongly correlated with a positive outcome measured by one criterion and weakly correlated with negative outcome measured by another criterion, not correlated to the outcome measured by a third criterion and so on. In that case, drawing a general conclusion on the role of an influencing variable is more difficult.

An overall outcome index has been constructed assuming a general and simplified form, mostly depending on the availability of data (i.e., quantity and quality), as emerged in Chapter 6. Moreover, the synthesis of an overall outcome index implies the assessment of the relative weight of each outcome variable, which is context and stakeholder specific (related to each stakeholder's perceptions and goals) and the subject of consideration. The approach assumed is presented below.

In order to analyse the role of projects' features on the overall outcome, an additive form of aggregation has been used. Case studies meeting forecasts for all outcome variables are associated to a positive overall outcome index and cases that have not met expectations for any performance indicator are associated to a negative overall outcome index. The rules to combine the individual index into the overall outcome index for the mixed cases – namely when some outcome indexes are positive and some are not – has been defined according to data availability.

The overall outcome index of a case study is determined with respect to the outcome variables as shown in Table A.255. In this case the outcome variables have all the same weight.

Table A. 255: Example of calculation of the overall outcome index

Nr.	Project	Transport demand		Investment Cost		Time schedule of completion of works		Overall outcome index
		Category	Outcome index	Category	Outcome index	Category	Outcome index	
1	XXXX	below forecast	-1	exceeded forecast	-1	below forecast	+1	**-1**
2	YYYY	below forecast	-1	in line with forecast	0	exceeded forecast	-1	**-2**
3	ZZZZ	far below forecast	-1	exceeded forecast	-1	in line with forecast	0	**-2**
4	JJJJ	exceeded forecast	+1	exceeded forecast	-1	below forecast	+1	**+1**
…	…	…	…	…	…	…	...	…

Once the overall outcome index has been obtained, the case studies can be analysed in the same way as explained for the third level of analysis (see section 5.2). By cross-tabulating the overall outcome index and an influencing variable (e.g., in Table A.256), the distributions of relevance across different groups of case

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studies can be compared, the significance of differences can be tested and therefore the influence of specific variables can be identified.

Table A. 256: Example of cross-tabulation analysis using the overall outcome index

Project size [million €]	**Overall outcome index**						
	-3	-2	-1	0	+1	+2	+3
lower than 100	0	0	1	4	2	1	0
100-500	0	1	4	3	1	1	0
500-1.000	1	5	7	7	2	0	0
higher than 1.000	2	3	4	2	0	0	0

The following formula shows how the overall outcome index is obtained.

$$\mathrm{OI} = \sum_{i=1}^{3} w_i \cdot x_i$$

where:

- *OI* is the overall outcome index;
- w_i is the weight associated to each outcome variable;
- x_i the outcome index associated to the categories of the outcome variables.

In order to facilitate the analysis of the results, the categories of the overall outcome index OI have been reduced to three only and more qualitatively, namely: “Lower than 0”, “0” and “Higher than 0”. It is worth remarking that the OI of a case study can be obtained only if all outcomes are available simultaneously, across the three variables. Due to the general level of data availability, it has been considered important to avoid dispersion of the observations in too many outcome categories.

The following paragraphs of this Appendix discuss the results of a selected number of cross-tabulations from which patterns can be identified[59]. As anticipated above, the baseline case assumes a vector of weights $V_0 = [1; 1; 1]$. The sensitivity analysis modifies the weights of the outcomes through a variable-by-variable approach, using the following vectors: $V_C = [2; 1; 1]$, $V_D = [1; 2; 1]$ and $V_T = [1; 1; 2]$. The cross-tabulations of the sensitivity analysis are gathered in the Appendix A.5.

[59] Due to the limited number of observations available at this level of the analysis, the Chi-squared test has not been performed.

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The analysis by **financing scheme** shows that, in the baseline case (V_0) and in general, public projects perform worse than PPPs. When the OI is “Lower than 0”, the rate of cases is higher (64% against 42%). The two schemes are comparable and close to the average of the category when the OI is neutral (21% against 18%). PPPs perform better also when the OI is “Higher than 0” (37% against 18%). If the allocation of weights is modified, the distribution of the overall OI changes only when V_C and V_D are introduced and only for one public case that shifts to the category “Higher than 0”. The results do not change using V_T.The distribution of PPPs remains always unchanged. See Table A.257, Figure A.1 and Table A.269.

Table A.257: Overall OI by financing scheme

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	PPP	8	4	7	**19**	42%	21%	37%
	Public	7	2	2	**11**	64%	18%	18%
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

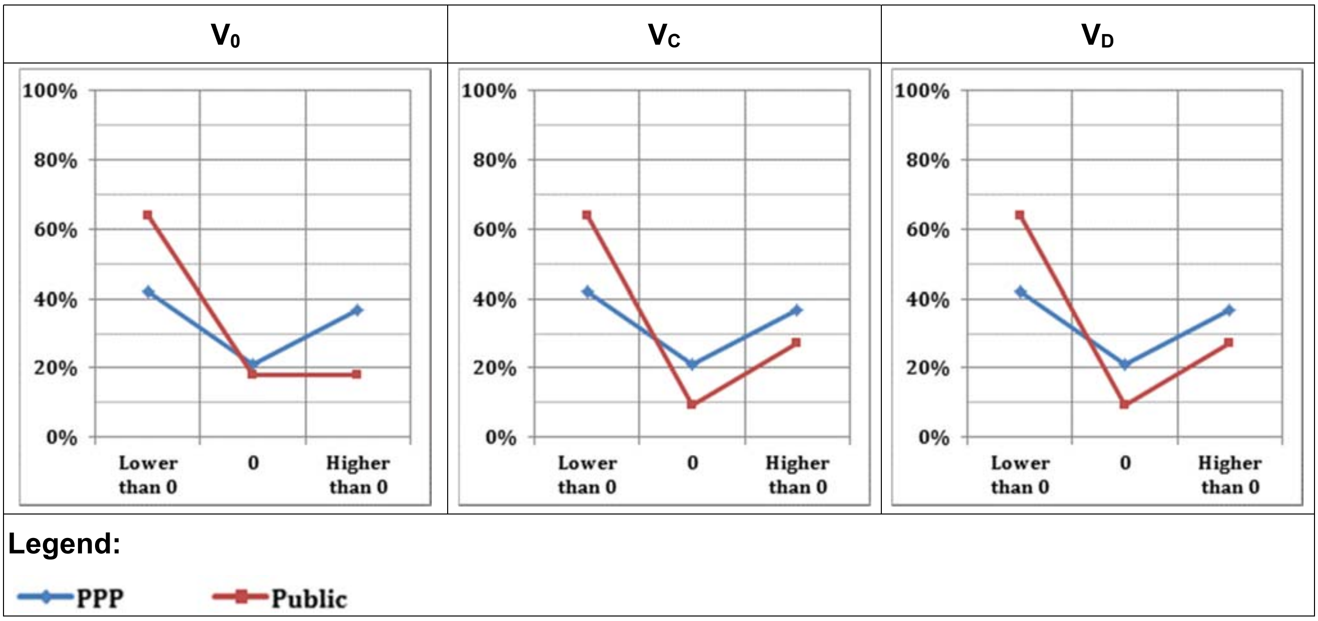

Figure A.1: Sensitivity analysis with respect to the financing scheme

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To some extent the **size of the investment** seems to matter on the aggregate outcome of the cases. In this analysis the overall OI is more likely to fall in the outcome category “Lower than 0” and it occurs in the three largest size categories. Although based on a very limited sample (4 observations), the distribution modifies as regards the smallest category (lower than 100 million Euro). It shows one case only in each category “Lower than zero” and “0” and two cases “higher than zero”. Performing the sensitivity analysis, the distribution of the observations modifies in the categories “100-500 million Euro” and “higher than 1.000 million Euro”, when the vectors V_C and V_D are used. In the size category “100-500 million Euro” one case shifts from “Lower than 0” to “0” . In the largest size category the polarisation on the two extremes becomes more evident (from [3:2;3] to [4;0;4]). The results do not change using V_T. See Table A.258, Figure A.2 and Table A.270.

Table A.258: Overall OI by size of the investment (million Euro, 2013)

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	**0**	**Higher than 0**	**Total**	**Lower than 0**	**0**	**Higher than 0**
V_0	lower than 100	1	1	2	**4**	25%	25%	50%
	100-500	7	2	2	**11**	64%	18%	18%
	500-1.000	4	1	2	**7**	57%	14%	29%
	higher than 1.000	3	2	3	**8**	38%	25%	38%
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

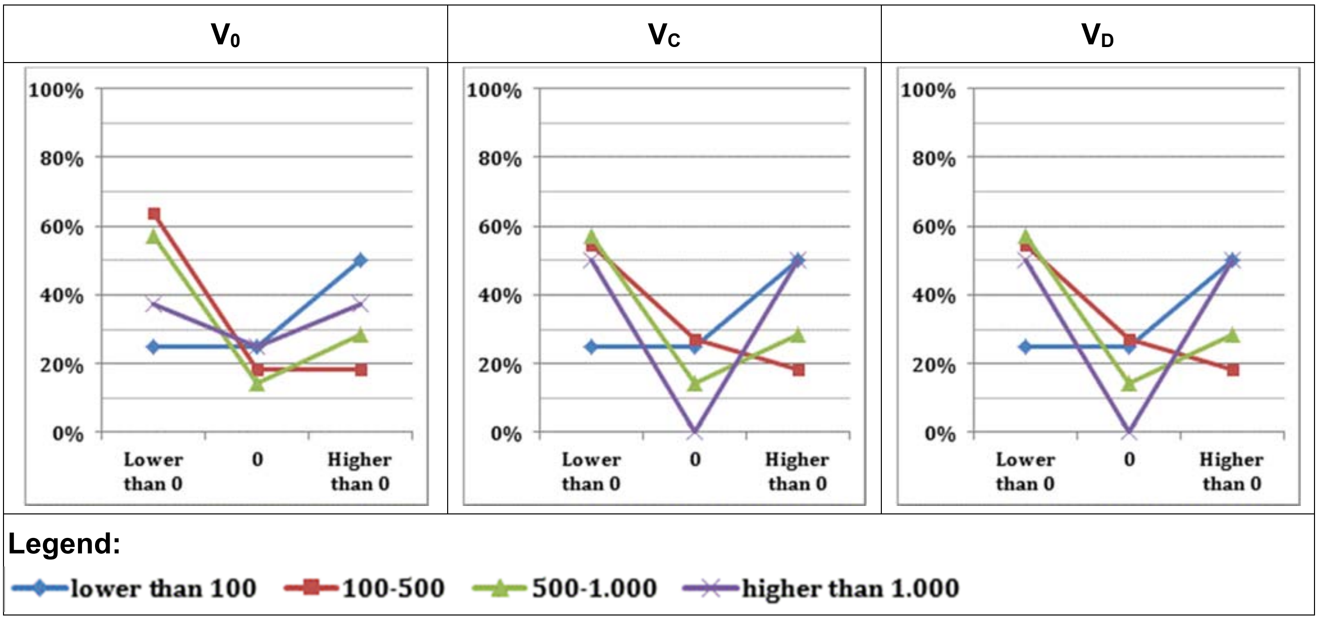

Figure A.2: Sensitivity analysis with respect to the size of the investment (million Euro, 2013)

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As in the previous analysis, the number of observations on which patterns can be identified is very limited. Nevertheless, regarding the **physical description**, nodes within nodes and links within links, seem perform better than nodes and links. The overall OI of the unique case in the category “Node within a Node” does not move across categories when the sensitivity is performed, as always “Higher than 0”. With respect to the category “Link within a link” when the vector V_C is used one case shifts from “0” to “Higher than zero” (from [1;1;2] to [1;0;3]), while the vector V_D makes the distribution polarized at the two extremes [2;0;2]. The results do not change using V_T. See Table A.259, Figure A.3 and Table A.271.

Table A.259: Overall OI by physical description

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	Node within a Node	0	0	1	**1**	0%	0%	100%
	Link within a Link	1	1	2	**4**	25%	25%	50%
	Node	3	0	2	**5**	60%	0%	40%
	Link	11	4	4	**19**	58%	21%	21%
	Total	**15**	**5**	**9**	**29**	**52%**	**17%**	**31%**

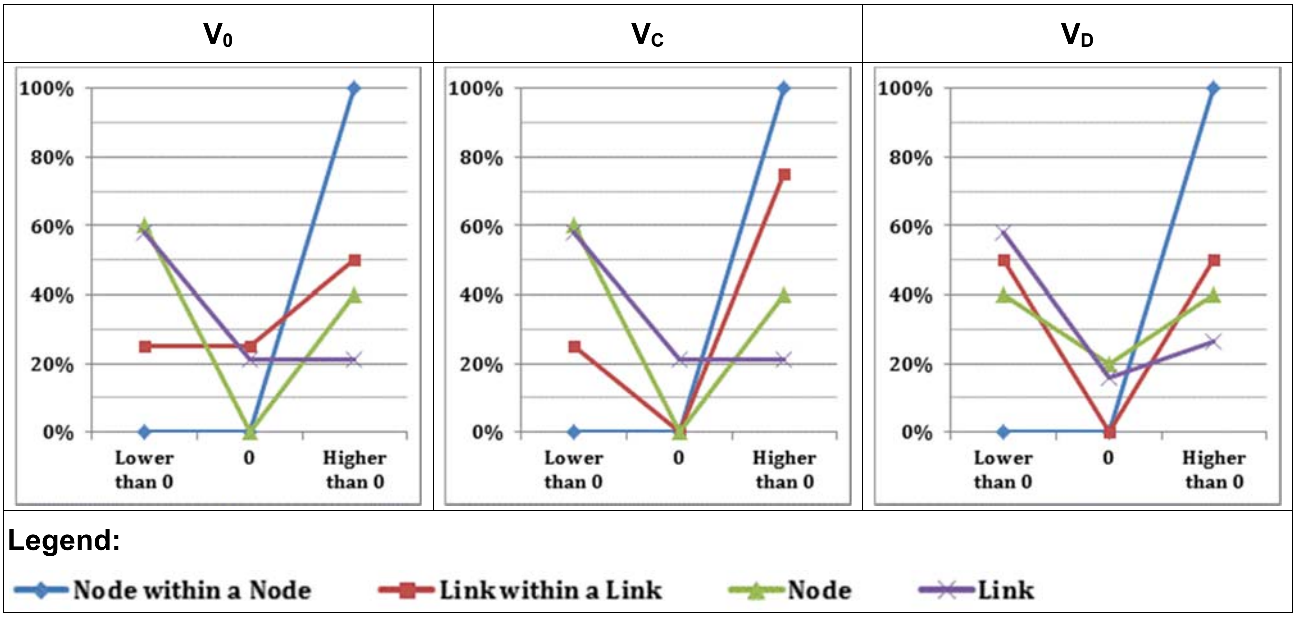

Figure A.3: Sensitivity analysis with respect to physical description

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The overall analysis by **locality** shows that the category of urban projects have some advantage with respect to those of the other categories, as half of the observations fall in the category “Higher than 0” (5 out of 10). The category of the regional cases could be considered as a second instance, since the rate of observations is higher than the average of the sample, across all categories of overall OI. Outer urban, inter-urban and international categories have the majority of the observations available “Lower than 0”. Urban cases are sensible to the change of the weights. Using V_C, the distribution changes from [3;2;5] to [4;1;5] while with V_D to [3;1;6]. The same occurs in regional projects, namely from [1;3;2] to [1;2;3] with V_C and to [2;2;2] with V_D. It is worth remarking that from the sensitivity analysis performed a clear pattern emerges, when the variation of costs has a higher weight to calculate the overall OI. The categories above do not change with V_T. See Table A.260, Figure A.4 and Table A.272.

Table A. 260: Overall OI by locality

Overall Outcome Index (OI)		**Absolute values (number of projects)**				**Share**		
		Lower than 0	**0**	**Higher than 0**	**Total**	**Lower than 0**	**0**	**Higher than 0**
V_0	Urban	3	2	5	**10**	30%	20%	50%
	Outer urban	3	0	1	**4**	75%	0%	25%
	Inter-urban	6	1	1	**8**	75%	13%	13%
	Regional	1	3	2	**6**	17%	50%	33%
	Rural	0	0	0	**0**	0%	0%	0%
	Cross Border	0	0	0	**0**	0%	0%	0%
	International	2	0	0	**2**	100%	0%	0%
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

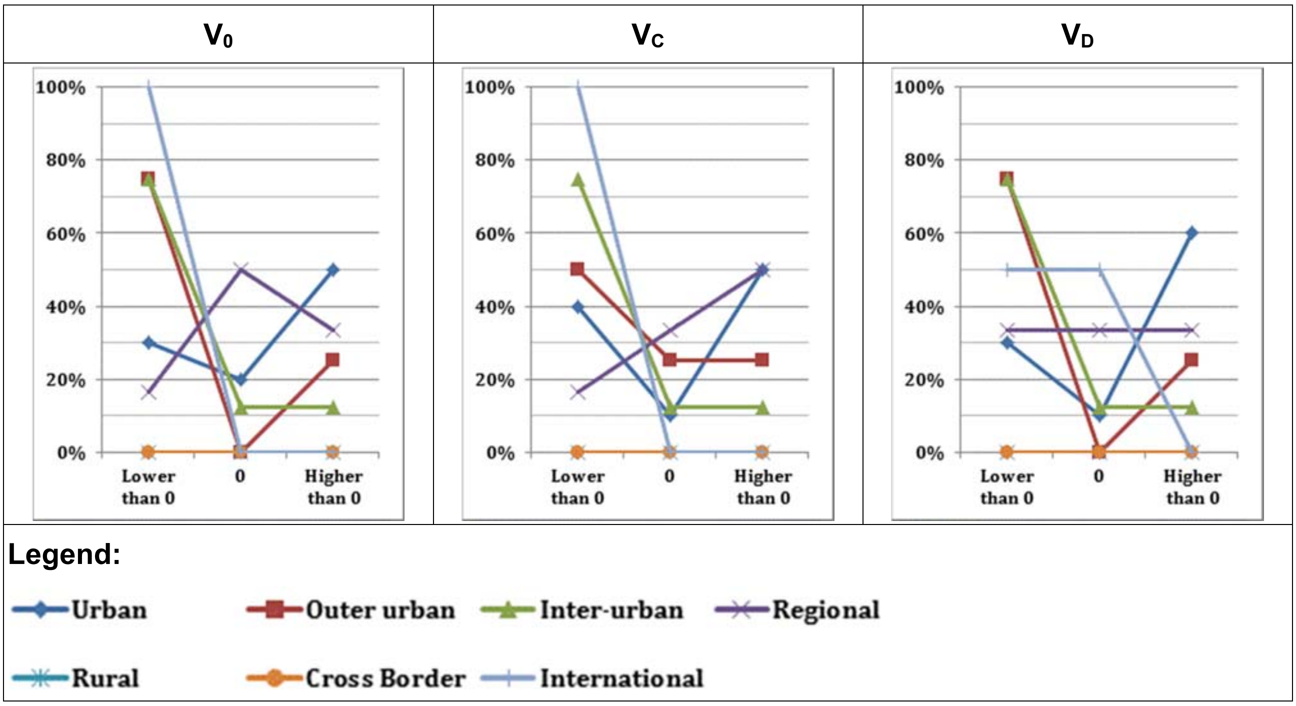

Figure A.4: Sensitivity analysis with respect to locality

The analysis on **type of expected repayment revenues during the operating phase** shows two patterns when a distinction is done by cases that are based on user charges, with respect to those based on “All

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other forms". In the former category, the majority of the observations (67%) falls in the category "Higher than 0", while in the latter the opposite occurs as having 11 out of 21 cases (52%) "Lower than 0". In the sensitivity analysis, the result obtained changes only in the aggregate category of revenue "All other forms" and when the vector V_D is used (one case shifts from "Lower than 0" to "0" and one from "0" to "Higher than 0"). The results do not change using V_T. See Table A.261, Figure A.5 and Table A.273.

Table A.261: Overall OI by type of expected repayment revenues during the operating phase

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	User charges	2	0	4	**6**	33%	0%	67%
	All other forms	11	5	5	**21**	52%	24%	24%
	Total	**13**	**5**	**9**	**27**	**48%**	**19%**	**33%**

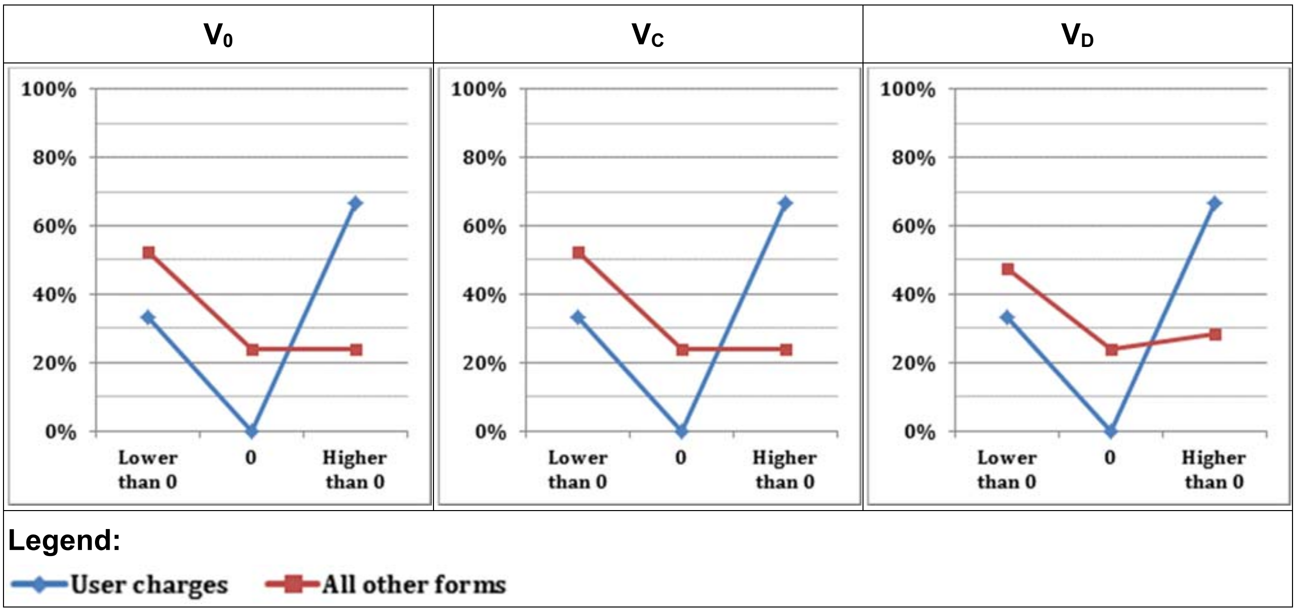

Figure A.5: Sensitivity analysis with respect to type of expected repayment revenues during the operating phase

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With respect to the **construction risk** different patterns emerge when the risk (always in aggregate form) is allocated to the contractor, instead of the public party. In the former case, the observations of the overall OI are mostly "Lower than 0" (14 out of 25, or 56%). On the other hand, if the risk is allocated to the public party the overall OI improves by category (although based on 3 cases only). These results do not change with the vector assumed in the sensitivity analysis, except in one case that shifts from "0" to "Higher than 0" considering V_D. The results do not change using V_T. See Table A.262, Figure A.6 and Table A.274.

Table A.262: Overall OI by construction risk allocation

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	Aggregate contractor	14	4	7	**25**	56%	16%	28%
	Aggregate public	0	1	2	**3**	0%	33%	67%
	Total	**14**	**5**	**9**	**28**	**50%**	**18%**	**32%**

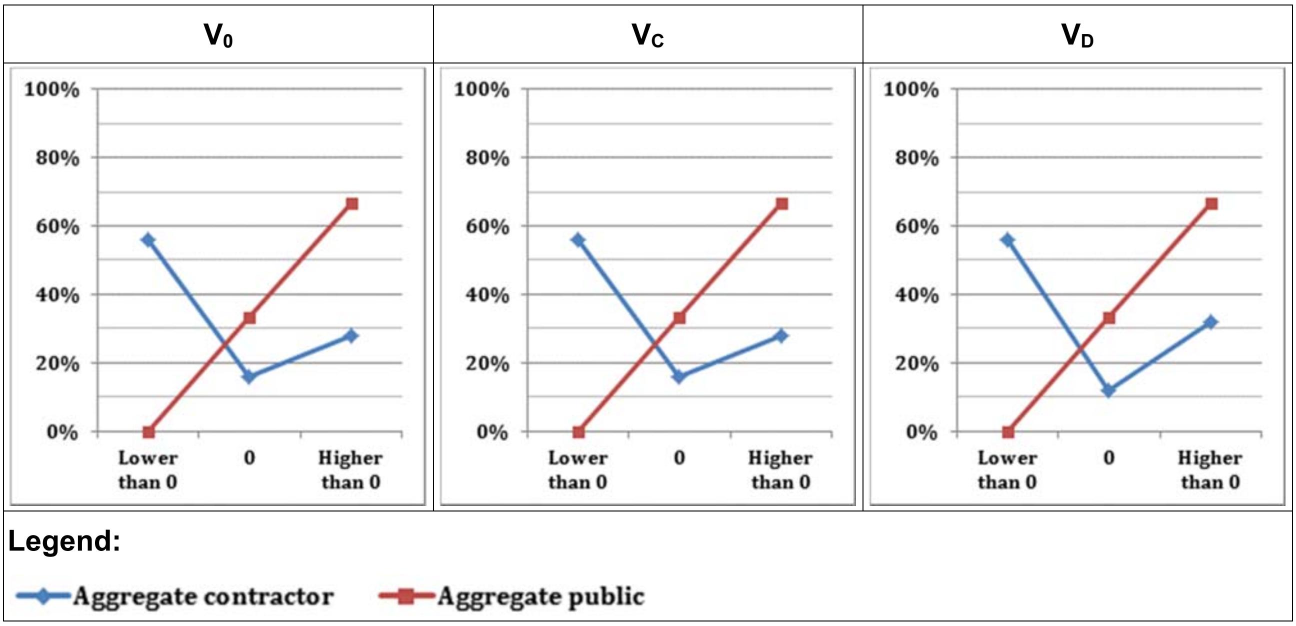

Figure A.6: Sensitivity analysis with respect to construction risk allocation

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The analysis on the **revenue risk** allocation shows interesting results. The cross-tabulations makes evident that if the risk is allocated to the public party, the number of observations of the overall OI steadily decreases across categories [8;3;1]. On the other hand, if the contractor is in charge of revenue risk, almost half of all the cases fall in the category "Higher" than 0" (8 out of 17, or 47%). The distribution of the observations is independent from the vector assumed when the risk is allocated to the contractor. Referring to the public party, the observations are sensible in one case only, namely if the vector V_D is used. (one case shifts from "Lower than 0" to "0" and one from "0" to "Higher than 0"). The results do not change using V_T. See Table A.263, Figure A.7 and Table A.275.

Table A. 263: Overall OI by revenue risk allocation

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	**0**	**Higher than 0**	**Total**	**Lower than 0**	**0**	**Higher than 0**
V_0	Aggregate contractor	7	2	8	**17**	41%	12%	47%
	Aggregate public	8	3	1	**12**	67%	25%	8%
	Total	**15**	**5**	**9**	**29**	**52%**	**17%**	**31%**

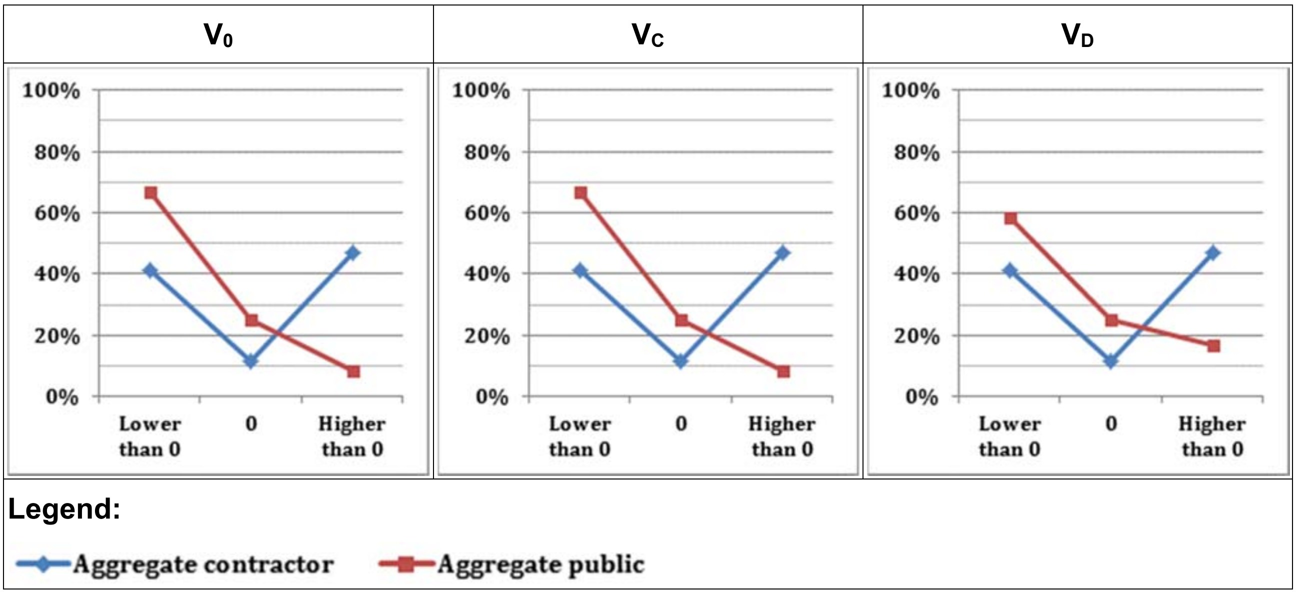

Figure A.7: Sensitivity analysis with respect to revenue risk allocation

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Another type of risk that deserves consideration in this analysis is the **financial risk**. In this case, it is not clear which party the risk should be allocated to, as in both cases the distributions of the overall OI are similar. When "Lower than 0", the rate of the cases is almost identical amongst parties (44% against 43%). The contractor shows an advantage (22% against 14%) in the neutral category, while the opposite occurs when the overall OI is "Higher than 0" (43% against 33%, for the public party). The distribution of the observations is independent from the vector assumed when the risk is allocated to the contractor. The sensitivity analysis influences the result of the public party in one case only using the vector V_D, where one observation shifts from "0" to "Higher than 0". The results do not change using V_T. See Table A.264, Figure A.8 and Table A.276.

Table A. 264: Overall OI by financial risk allocation

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	Aggregate contractor	8	4	6	**18**	44%	22%	33%
	Aggregate public	3	1	3	**7**	43%	14%	43%
	Total	**11**	**5**	**9**	**25**	**44%**	**20%**	**36%**

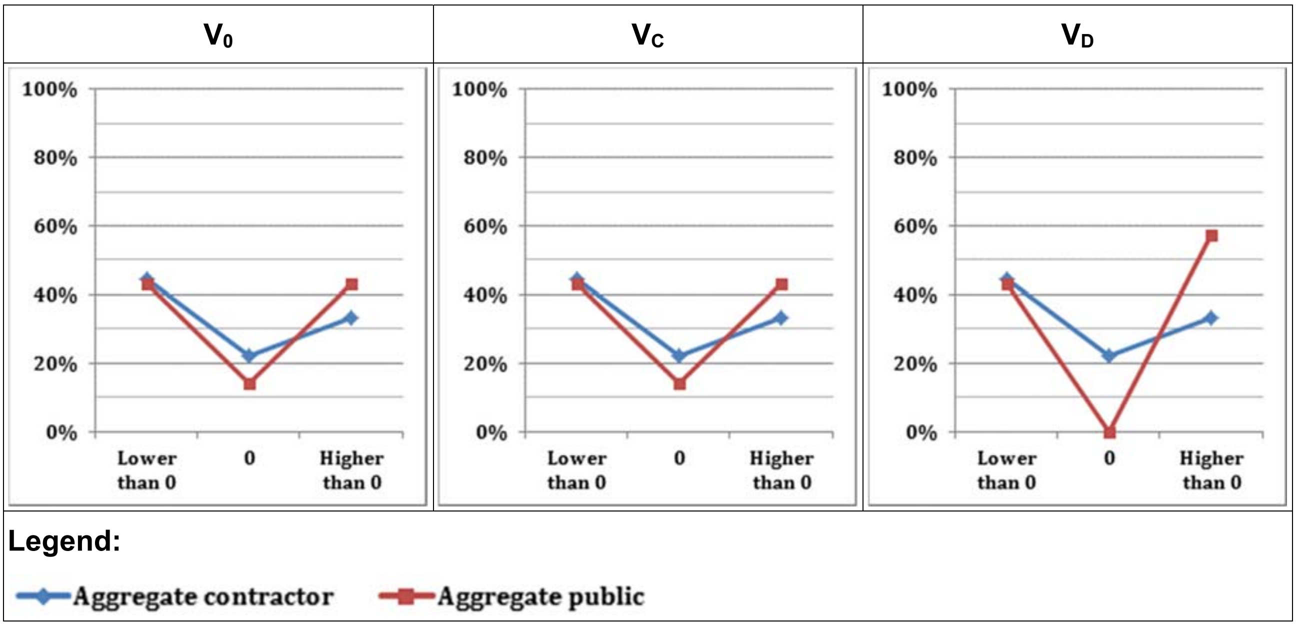

Figure A.8: Sensitivity analysis with respect to financial risk allocation

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The **type of users** is a variable that influences the distribution of the overall OI. In this analysis a distinction can be made between user-specific projects (freight, or passengers only) and those conceived for a mixed use. Considering a further level of aggregation (reasonable as two cases only concern freight category), user-specific projects perform better than mixed use ones across all outcome categories. The sensitivity analysis does not influence freight cases. Passenger-specific cases are sensible to V_C (one case shifts from the category “0” to “Lower than 0” [3;2;3] to [4;1;3]) and V_D from (one case shifts from the category “0” to “Higher than 0” [3;2;3] to [3;1;4]). The distribution of the cases conceived for mixed use changes only if V_C is used (from [12;4;4] to [11;4;5]). The results do not change using V_T. See Table A.265, Figure A.9 and Table A.277.

Table A. 265: Overall OI by type of users

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	Only freight/cargo	0	0	2	**2**	0%	0%	100%
	Only pass./indiv. users	3	2	3	**8**	38%	25%	38%
	Mix use (freight/pass.)	12	4	4	**20**	60%	20%	20%
	Non-transport users	0	0	0	**0**	0	0	0
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

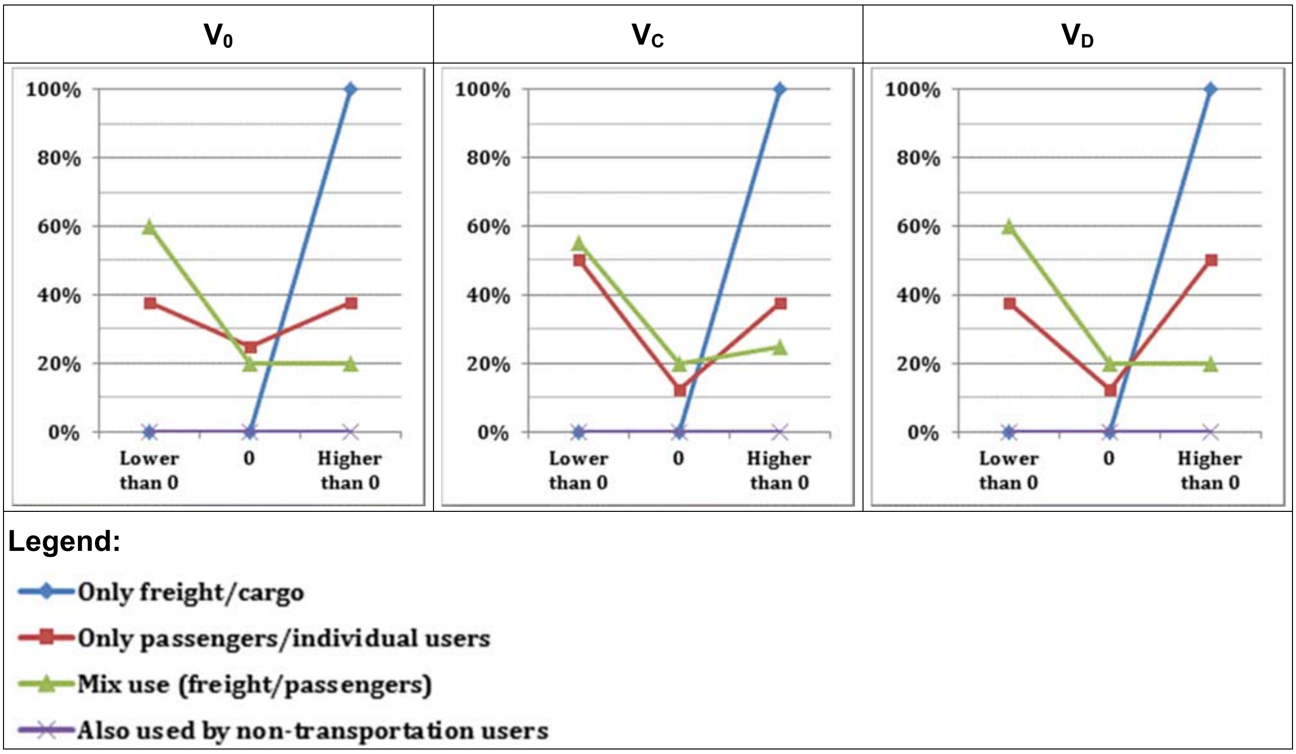

Figure A.9: Sensitivity analysis with respect to type of users

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Per capita GDP shows a relationship with the overall OI. In this respect, cases that have been implemented in contexts wherein per capita GDP is lower, or in line, with expectations show performance that is consistent with the trend highlighted. On the other hand, such conclusion cannot be drawn when per capita GDP is higher than expectations. About this category one case only shows an overall OI “Higher than 0”. In trying to understand such pattern the variations of per capita GDP could be analysed with respect to other drivers, like for example the variation of the population density in the region. Nevertheless, the distribution of the population density with respect to per capita GDP does fully support this perspective. Per capita GDP results higher than expectations if population density increased in the majority of the observations (11 out of 15 cases) and the same occurs about the neutral category (7 out of 13). Nevertheless, when GDP is lower than expectations, population density increased (11 out of 23). Introducing the other vectors the distribution of the observations changes when using V_C and V_D. Regarding V_C the observations change when “higher than expectations” (from [3;3;1] to [2;3;2]) and in “line with expectations” (from [1;3;1] to [2;2;1]). About V_D the categories influenced coincide with those above as follows: from [3;3;1] to [4;2;1] when “higher” and from [1;3;1] to [1;2;2] when “in line”. The results do not change using V_T. See Table A.266, Figure A.10 and Table A.278.

Table A.266: Overall OI by variation of per capita GDP

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	higher than expect.	3	3	1	**7**	43%	43%	14%
	in line with expect.	1	3	1	**5**	20%	60%	20%
	lower than expectat.	10	0	5	**15**	67%	0%	33%
	Total	**14**	**6**	**7**	**27**	**52%**	**22%**	**26%**

Table A.267: Per capita GDP in relation to population density

Per capita GDP	Population density					
	Absolute values			Share		
	lower	unchanged	higher	lower	unchanged	higher
higher than expect.	2	2	11	13%	13%	73%
in line with expect.	0	7	6	0%	54%	46%
lower than expect.	4	8	11	17%	35%	48%
Total	**6**	**17**	**28**	**12%**	**33%**	**55%**

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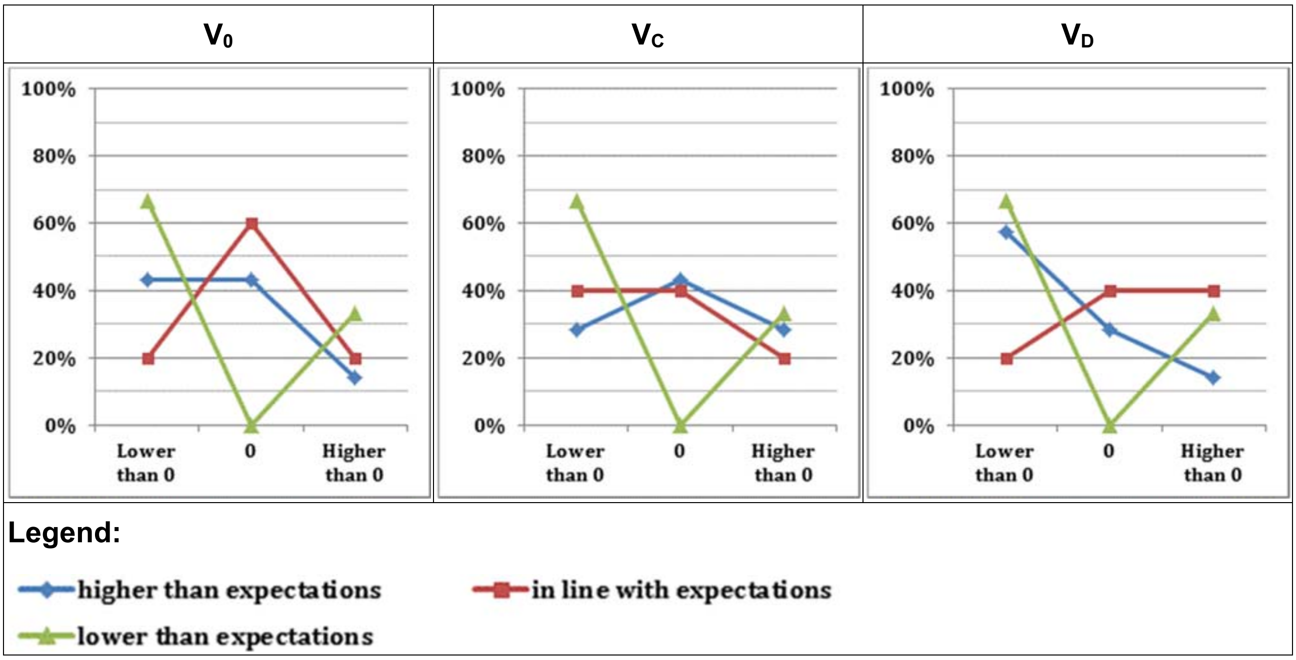

Figure A.10: Sensitivity analysis with respect to variations of per capita GDP

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In relation to the **main project purpose** 19 out of 26 cases refer to reasons inherently related to time savings (reducing travel time and relieving congestion). The overall OI of these observations is “Lower than 0” in more than half of the cases (11 out of 19, or 58%) and the pattern is steadily decreasing through the other categories. This outcome modifies when vectors V_C and V_D are introduced; in both, the initial distribution changes from [11;5;3] to [11;4;4], hence with a slight improvement. The results do not change using V_T. Further considerations can be drawn considering the main project purpose of the contracting authority, with respect to the **type of users**. Table A.280 shows that 26 out of 34 (or 76%) of the observations refer to mix use cases. Putting this in relationship with the rate of projects with overall OI “Lower than 0” (58%), it seems that there exists a higher propensity of projects conceived for a mix use of performing worse. See Table A.268, Figure A.11 and Table A.279.

Table A.268: Overall OI by main project purpose of the contracting authority

Overall Outcome Index (OI)		Absolute values (number of projects)				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_0	Reducing travel time + Relieving congestion	11	5	3	**19**	58%	26%	16%
	Reducing travel costs	0	0	0	**0**	0	0	0
	Improving reliability of transportation	1	0	4	**5**	20%	0%	80%
	Improving safety of transportation	2	0	0	**2**	100%	0%	0%
	Total	**14**	**5**	**7**	**26**	**54%**	**19%**	**27%**

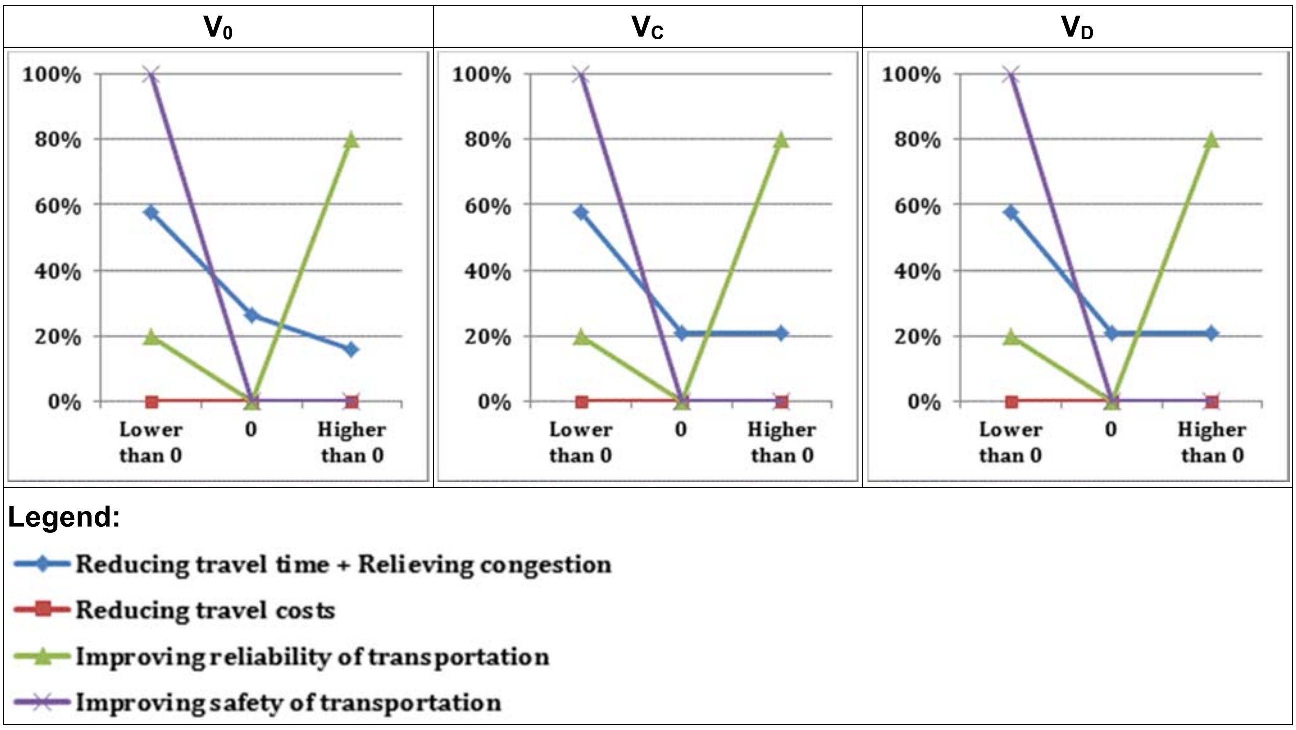

Figure A.11: Sensitivity analysis with respect to the main project purpose of the contracting authority

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A.5 Cross-tabulations of the fourth level of analysis (sensitivities only)

Table A.269 - Overall OI by financing scheme

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	PPP	8	4	7	**19**	42%	21%	37%
	Public	7	1	3	**11**	64%	9%	27%
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_D	PPP	8	4	7	**19**	42%	21%	37%
	Public	7	1	3	**11**	64%	9%	27%
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_T	PPP	8	4	7	**19**	42%	21%	37%
	Public	7	2	2	**11**	64%	18%	18%
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

Table A.270 - Overall OI by size of the investment

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	lower than 100	1	1	2	4	25%	25%	50%
	100-500	6	3	2	11	55%	27%	18%
	500-1.000	4	1	2	7	57%	14%	29%
	higher than 1.000	4	0	4	8	50%	0%	50%
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_D	lower than 100	1	1	2	**4**	25%	25%	50%
	100-500	6	3	2	**11**	55%	27%	18%
	500-1.000	4	1	2	**7**	57%	14%	29%
	higher than 1.000	4	0	4	**8**	50%	0%	50%
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_T	lower than 100	1	1	2	4	25%	25%	50%
	100-500	7	2	2	11	64%	18%	18%
	500-1.000	4	1	2	7	57%	14%	29%
	higher than 1.000	3	2	3	8	38%	25%	38%
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

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Table A.271 - Overall OI by physical description

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	Node within a Node	0	0	1	**1**	0%	0%	100%
	Link within a Link	1	0	3	**4**	25%	0%	75%
	Node	3	0	2	**5**	60%	0%	40%
	Link	11	4	4	**19**	58%	21%	21%
	Total	**15**	**4**	**10**	**29**	**52%**	**14%**	**34%**
V_D	Node within a Node	0	0	1	**1**	0%	0%	100%
	Link within a Link	2	0	2	**4**	50%	0%	50%
	Node	2	1	2	**5**	40%	20%	40%
	Link	11	3	5	**19**	58%	16%	26%
	Total	**15**	**4**	**10**	**29**	**52%**	**14%**	**34%**
V_T	Node within a Node	0	0	1	**1**	0%	0%	100%
	Link within a Link	1	1	2	**4**	25%	25%	50%
	Node	3	0	2	**5**	60%	0%	40%
	Link	11	4	4	**19**	58%	21%	21%
	Total	**15**	**5**	**9**	**29**	**52%**	**17%**	**31%**

Table A.272 - Overall OI by locality

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	Urban	4	1	5	**10**	40%	10%	50%
	Outer urban	2	1	1	**4**	50%	25%	25%
	Inter-urban	6	1	1	**8**	75%	13%	13%
	Regional	1	2	3	**6**	17%	33%	50%
	Rural	0	0	0	**0**	0%	0%	0%
	Cross Border	0	0	0	**0**	0%	0%	0%
	International	2	0	0	**2**	100%	0%	0%
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_D	Urban	3	1	6	**10**	30%	10%	60%
	Outer urban	3	0	1	**4**	75%	0%	25%
	Inter-urban	6	1	1	**8**	75%	13%	13%
	Regional	2	2	2	**6**	33%	33%	33%
	Rural	0	0	0	**0**	0%	0%	0%
	Cross Border	0	0	0	**0**	0%	0%	0%
	International	1	1	0	**2**	50%	50%	0%
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_T	Urban	3	2	5	**10**	30%	20%	50%
	Outer urban	3	0	1	**4**	75%	0%	25%
	Inter-urban	6	1	1	**8**	75%	13%	13%
	Regional	1	3	2	**6**	17%	50%	33%
	Rural	0	0	0	**0**	0%	0%	0%
	Cross Border	0	0	0	**0**	0%	0%	0%
	International	2	0	0	**2**	100%	0%	0%
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

Table A.273 - Overall OI by type of expected repayment revenues during the operating phase

Overall OI	Absolute values	Share

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		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	User charges	2	0	4	**6**	33%	0%	67%
	All other forms	11	5	5	**21**	52%	24%	24%
	Total	**13**	**5**	**9**	**27**	**48%**	**19%**	**33%**
V_D	User charges	2	0	4	**6**	33%	0%	67%
	All other forms	10	5	6	**21**	48%	24%	29%
	Total	**12**	**5**	**10**	**27**	**44%**	**19%**	**37%**
V_T	User charges	2	0	4	**6**	33%	0%	67%
	All other forms	11	5	5	**21**	52%	24%	24%
	Total	**13**	**5**	**9**	**27**	**48%**	**19%**	**33%**

Table A.274 - Overall OI by construction risk allocation

Overall OI		**Absolute values**				**Share**		
		Lower than 0	**0**	**Higher than 0**	**Total**	**Lower than 0**	**0**	**Higher than 0**
V_C	Aggregate contractor	14	4	7	**25**	56%	16%	28%
	Aggregate public	0	1	2	**3**	0%	33%	67%
	Total	**14**	**5**	**9**	**28**	**50%**	**18%**	**32%**
V_D	Aggregate contractor	14	3	8	**25**	56%	12%	32%
	Aggregate public	0	1	2	**3**	0%	33%	67%
	Total	**14**	**4**	**10**	**28**	**50%**	**14%**	**36%**
V_T	Aggregate contractor	14	4	7	**25**	56%	16%	28%
	Aggregate public	0	1	2	**3**	0%	33%	67%
	Total	**14**	**5**	**9**	**28**	**50%**	**18%**	**32%**

Table A.275 - Overall OI by revenue risk allocation

Overall OI		**Absolute values**				**Share**		
		Lower than 0	**0**	**Higher than 0**	**Total**	**Lower than 0**	**0**	**Higher than 0**
V_C	Aggregate contractor	7	2	8	**17**	41%	12%	47%
	Aggregate public	8	3	1	**12**	67%	25%	8%
	Total	**15**	**5**	**9**	**29**	**52%**	**17%**	**31%**
V_D	Aggregate contractor	7	2	8	**7**	41%	12%	47%
	Aggregate public	7	3	2	**7**	58%	25%	17%
	Total	**14**	**5**	**10**	**14**	**48%**	**17%**	**34%**
V_T	Aggregate contractor	7	2	8	**17**	41%	12%	47%
	Aggregate public	8	3	1	**12**	67%	25%	8%
	Total	**15**	**5**	**9**	**29**	**52%**	**17%**	**31%**

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Table A. 276 - Overall OI by financial risk allocation

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	Aggregate contractor	8	4	6	**18**	44%	22%	33%
	Aggregate public	3	1	3	**7**	43%	14%	43%
	Total	**11**	**5**	**9**	**25**	**44%**	**20%**	**36%**
V_D	Aggregate contractor	8	4	6	**18**	44%	22%	33%
	Aggregate public	3	0	4	**7**	43%	0%	57%
	Total	**11**	**4**	**10**	**25**	**44%**	**16%**	**40%**
V_T	Aggregate contractor	8	4	6	**18**	44%	22%	33%
	Aggregate public	3	1	3	**7**	43%	14%	43%
	Total	**11**	**5**	**9**	**25**	**44%**	**20%**	**36%**

Table A. 277 - Overall OI by type of users

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	Only freight/cargo	0	0	2	**2**	0%	0%	100%
	Only pass./ind. users	4	1	3	**8**	50%	13%	38%
	Mix use (freight/pass.)	11	4	5	**20**	55%	20%	25%
	Non-transport users	0	0	0	**0**	0	0	0
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_D	Only freight/cargo	0	0	2	**2**	0%	0%	100%
	Only pass./ind. users	3	1	4	**8**	38%	13%	50%
	Mix use (freight/pass.)	12	4	4	**20**	60%	20%	20%
	Non-transport users	0	0	0	**0**	0	0	0
	Total	**15**	**5**	**10**	**30**	**50%**	**17%**	**33%**
V_T	Only freight/cargo	0	0	2	**2**	0%	0%	100%
	Only pass./ind. users	3	2	3	**8**	38%	25%	38%
	Mix use (freight/pass.)	12	4	4	**20**	60%	20%	20%
	Non-transport users	0	0	0	**0**	0	0	0
	Total	**15**	**6**	**9**	**30**	**50%**	**20%**	**30%**

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Table A. 278 - Overall OI by variation of per capita GDP

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	higher than expect.	2	3	2	**7**	29%	43%	29%
	in line with expect.	2	2	1	**5**	40%	40%	20%
	lower than expect.	10	0	5	**15**	67%	0%	33%
	Total	**14**	**5**	**8**	**27**	**52%**	**19%**	**30%**
V_D	higher than expect.	4	2	1	**7**	57%	29%	14%
	in line with expect.	1	2	2	**5**	20%	40%	40%
	lower than expect.	10	0	5	**15**	67%	0%	33%
	Total	**15**	**4**	**8**	**27**	**56%**	**15%**	**30%**
V_T	higher than expect.	3	3	1	3	43%	43%	14%
	in line with expect.	1	3	1	1	20%	60%	20%
	lower than expect.	10	0	5	10	67%	0%	33%
	Total	**14**	**6**	**7**	**14**	**52%**	**22%**	**26%**

Table A.279 - Overall OI by main project purpose of the contracting authority

Overall OI		Absolute values				Share		
		Lower than 0	0	Higher than 0	Total	Lower than 0	0	Higher than 0
V_C	Reducing travel time + Relieving congestion	11	4	4	19	58%	21%	21%
	Reducing travel costs	0	0	0	0	0	0	0
	Improving reliability of transportation	1	0	4	5	20%	0%	80%
	Improving safety of transportation	2	0	0	2	100%	0%	0%
	Total	**14**	**4**	**8**	**26**	**54%**	**15%**	**31%**
V_D	Reducing travel time + Relieving congestion	11	4	4	**19**	58%	21%	21%
	Reducing travel costs	0	0	0	**0**	0	0	0
	Improving reliability of transportation	1	0	4	**5**	20%	0%	80%
	Improving safety of transportation	2	0	0	**2**	100%	0%	0%
	Total	**14**	**4**	**8**	**26**	**54%**	**15%**	**31%**
V_T	Reducing travel time + Relieving congestion	11	5	3	**19**	58%	26%	16%
	Reducing travel costs	0	0	0	**0**	0	0	0
	Improving reliability of transportation	1	0	4	**5**	20%	0%	80%
	Improving safety of transportation	2	0	0	**2**	100%	0%	0%
	Total	**14**	**5**	**7**	**26**	**54%**	**19%**	**27%**

Table A.280 - Project purpose in relation to the type of user

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Project purpose	Type of user							
	Absolute values				Share			
	Only freight/cargo	**Only passengers/individual users**	**Mix use (freight/passengers)**	**Also used by non-transportation users**	**Only freight/cargo**	**Only passengers/individual users**	**Mix use (freight/passengers)**	**Also used by non-transportation users**
Reducing travel time + Relieving congestion	2	6	26	0	6%	18%	76%	0%
Reducing travel costs	1	0	0	0	100%	0%	0%	0%
Improving reliability of transportation	1	3	3	1	13%	38%	38%	13%
Improving safety of transportation	0	0	4	0	0%	0%	100%	0%
Total	**4**	**9**	**34**	**1**	**9%**	**19%**	**70%**	**2%**

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A.6 List of the classification variables (influencing and outcome) and data availability

Table A.281 - Data availability by classification variable

Variable		PPP	Public	Total
	WHAT (Shaded sections - General description of the project)			
1	Country	100%	100%	100%
2	Field	100%	97%	99%
3	Project Status	93%	97%	94%
4	Principal Transport mode infrastructure	100%	100%	100%
5	Construction budget (million)	85%	100%	90%
6	Construction budget (currency)	93%	100%	95%
7	Construction budget (reference year)	65%	93%	75%
8	Total investment (million)	80%	63%	74%
9	Actualisation of construction budget (Euro2013)	74%	97%	82%
10	Actualisation of construction budget, range (Euro2013)	74%	97%	82%
11	Level of Project Exclusivity	98%	97%	98%
12	Physical description in terms of network	96%	90%	94%
13	Level of Functional Integration of infrastructure project (description)	98%	97%	98%
14	Level of Functional Integration of infrastructure project (number)	96%	73%	82%
15	Is there other transport mode infrastructure included in the project	17%	33%	23%
16	Ratio of the principal mode on the investment costs (range)	80%	60%	73%
17	Ratio of the other modes infrastructure on the investment costs (range)	61%	50%	57%
18	Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment costs (value)	45%	50%	47%
19	Ratio of civil structures (eg. Bridges, tunnels, etc.) on the investment (range)	45%	50%	47%
20	Ratio of particular equipement (cranes, signaling systems etc.) on the investment costs	31%	40%	35%
	WHO-FOR (Shaded sections - Project users)			
21	Type of users	100%	93%	98%
	WHY - Reasons for selecting the delivery method/financing scheme			

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22	Reason to choose Private (co)financing	**91%**	**70%**	**83%**
23	Project included in TEN-T	**96%**	**97%**	**96%**
24	Financial vs Service needs	**70%**	**not applicable**	**not applicable**
	WHEN (Shaded sections - Timing of the project)			
25	Per capita GDP of the region at the time of data collection of the project with respect to GDP at project award.	**63%**	**67%**	**64%**
26	Per capita income level of the region at the time of data collection of the project with respect to income at project award.	**57%**	**53%**	**56%**
27	Unemployment rate of the region at the time of data collection of the project with respect to income at project award.	**63%**	**57%**	**61%**
	WHERE (Shaded sections - Locality and market geography)			
28	Project Locality	**98%**	**90%**	**95%**
29	Population density fo the region at the time of data collection of the project with respect to density at project award.	**78%**	**67%**	**74%**
30	Level of industrialization and economic activities in the region at the time of data collection	**70%**	**60%**	**67%**
31	Specific production activities started during/ afterthe completion of project planned and not foreseen when the project was planned	**59%**	**57%**	**58%**
	WHICHWAY (Procurement/tendering/contract)			
32	Tendering	**85%**	**not applicable**	**not applicable**
33	Range Number of Bidders in the 1st Stage	**100%**	**not applicable**	**not applicable**
34	Range Number of Bidders in negotiations	**100%**	**not applicable**	**not applicable**
35	Range Number of bidders in final stage	**100%**	**not applicable**	**not applicable**
36	Range Maximum of Bidders in negotiations and bidders in final stage	**100%**	**not applicable**	**not applicable**
37	Duration of project assignment procedure [years]	**100%**	**not applicable**	**not applicable**
38	Range Duration of project assignment procedure (years)	**100%**	**not applicable**	**not applicable**
39	Number of contracts	**100%**	**not applicable**	**not applicable**
40	Private provision	**87%**	**not applicable**	**not applicable**
41	Public Authority provision (activities not transferred)	**91%**	**not applicable**	**not applicable**
42	Contract overlaps	**45%**	**not applicable**	**not applicable**
43	Contract Guarantees	**76%**	**not applicable**	**not applicable**

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44	Renegotiation Clauses	69%	not applicable	not applicable
45	Delivery (Construction)	not applicable	63%	not applicable
46	Operation & Maintenance	not applicable	83%	not applicable
47	Financing (Construction) Structure	not applicable	93%	not applicable
48	Financing (Operation & Maintenance) Structure	not applicable	90%	not applicable
49	Tendering Construction - Number of contracts	not applicable	100%	not applicable
50	Tendering	not applicable	53%	not applicable
51	Range Number of Bidders in the 1st Stage	not applicable	90%	not applicable
52	Range Number of Bidders in negotiations	not applicable	93%	not applicable
53	Range Number of bidders in final stage	not applicable	93%	not applicable
50	Duration of project assignment procedure [years]	not applicable	93%	not applicable
55	Range Duration of project assignment procedure (years)	not applicable	93%	not applicable
56	Tendering	not applicable	10%	not applicable
57	Range Number of Bidders in the 1st Stage	not applicable	3%	not applicable
58	Range Number of Bidders in negotiations	not applicable	3%	not applicable
59	Range Number of bidders in final stage	not applicable	0%	not applicable
60	Duration of project assignment procedure [years]	not applicable	3%	not applicable
61	Range Duration of project assignment procedure (years)	not applicable	3%	not applicable
62	Costruction Contract (Type)	not applicable	60%	not applicable
63	Duration [months]	not applicable	50%	not applicable
64	Duration range (years)	not applicable	50%	not applicable
65	Operation and Maintenance - Number of contracts	not applicable	100%	not applicable
66	Operation & Maintenance Contract (Type)	not applicable	7%	not applicable
67	Duration [years]	not applicable	3%	not applicable
68	Duration range (years)	not applicable	3%	not applicable
	WHICHWAY (Shaded sections - Revenues Stream)			
69	Type of expected repayment revenues during the operating phase (expected repayment in case of public projects)	96%	53%	81%

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70	User charges (proposed/autonomously decided/imposed)	65%	43%	57%
71	User Charges (price-cap mechanism)	61%	not applicable	not applicable
72	User Charges (other payment schemes)	52%	27%	43%
73	Usage payments	19%	23%	20%
74	Usage payments (mechanism to cap the maximum amount of payment)	26%	not applicable	not applicable
75	Availability charge	0%	35%	33%
76	Quality performance payments (deductions for service underperformance)	50%	30%	43%
77	Are there bonuses for performance above the target?	50%	27%	42%
78	Quality performance payments (other payment schemes)	30%	20%	26%
79	Are there transfers to the private-sector party in the form of subventions? Which form do these subventions take?	46%	not applicable	not applicable
80	Is a revenue-cap mechanism applied?	41%	not applicable	not applicable
81	Secondary revenues	28%	17%	24%
	WHICHWAY - Risks			
82	Design Risk Allocation	91%	53%	77%
83	Design Risk Assessment	57%	53%	56%
84	Design Risk Mitigation	52%	50%	51%
85	Construction Risk Allocation	93%	53%	79%
86	Construction Risk Assessment	59%	53%	57%
87	Construction Risk Mitigation	57%	50%	55%
88	Maintenance Risk Allocation	94%	53%	80%
89	Maintenance Risk Assessment	59%	53%	57%
90	Maintenance Risk Mitigation	54%	50%	52%
91	Exploitation Risk Allocation	87%	40%	70%
92	Exploitation Risk Assessment	59%	40%	52%
93	Exploitation Risk Mitigation	56%	40%	50%
94	Commercial/Revenue Risk Allocation	89%	40%	71%
95	Commercial/Revenue Risk Assessment	59%	37%	51%
96	Commercial/Revenue Risk Mitigation	57%	40%	51%

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97	Financial Risk Allocation	89%	43%	73%
98	Financial Risk Assessment	59%	47%	55%
99	Financial Risk Mitigation	56%	43%	51%
100	Regulatory Risk Allocation	81%	50%	70%
101	Regulatory Risk Assessment	59%	50%	56%
102	Regulatory Risk Mitigation	56%	50%	54%
103	Force majeure Risk Allocation	81%	43%	68%
104	Force majeure Risk Assessment	56%	43%	51%
105	Force majeure Mitigation	54%	40%	49%
106	Other Risk Allocation	43%	20%	35%
107	Other Risk Assessment	33%	20%	29%
108	Other Risk Mitigation	31%	20%	27%
	WHICHWAY - Project income sources			
109	Funding agent (agent providing revenues)	69%	not applicable	not applicable
110	Indexation (Level of use/user-pays)	54%	not applicable	not applicable
111	Indexation (Externality internalization)	28%	not applicable	not applicable
112	Level of revenue. Amount:	26%	not applicable	not applicable
113	Level of revenue. Cost coverage:	9%	not applicable	not applicable
	WHICHWAY - Performance with respect to project costs			
114	Cost/Budgeted of Investment (cost overruns) (quantitative)	50%	53%	51%
115	Cost/Budgeted of Investment (cost overruns) (qualitative)	50%	53%	51%
116	Costs due to changes of design standards generating impact on investment costs (reduction/increase)	20%	33%	25%
117	Costs due to changes of design standards generating impact on investment costs (%)	38%	40%	38%
118	Impact of actual project implementation schedule on costs (reduction/increase)	15%	33%	21%
119	Impact of actual project implementation schedule on costs (%)	17%	27%	20%
120	Time lost due to opposition (after project award) and its impact on project costs (%)	9%	17%	12%
121	Impact of agreed requests of complementary works (new works) on costs (%)	15%	33%	22%
122	Impact of changes of project layout (reduction/increase)	13%	14%	13%

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123	Impact of changes of project layout (%)	15%	27%	19%
124	Impact of changes for mitigation of environmental damage (reduction/increase)	2%	13%	6%
125	Impact of changes for mitigation of environmental damage (%)	17%	23%	19%
126	Introduction of innovation (all types). Relevant impact on investment costs:	13%	10%	12%
127	Introduction of innovation (all types).Relevant impact on operation/maintance costs:	13%	7%	11%
	WHICHWAY (Shaded sections - Performance with respect to project revenues)			
128	Actual traffic vs forecasts	65%	37%	55%
129	Actual other revenues vs forecast	41%	27%	36%
130	Changes of pricing regulations generating impact on investment revenues (reduction/increase)	7%	20%	12%
131	Changes of pricing regulations generating impact on investment revenues (%)	30%	30%	30%
132	Delay in beginning of works [years]	44%	50%	46%
133	Delay in beginning of works	44%	50%	46%
134	Delay in completion of works/opening of operation [years]	54%	53%	54%
135	Delay in completion of works/opening of operation	54%	53%	54%
	WHICHWAY - Re-negotiations (after project award)			
136	Number of re-negotiations	41%	not applicable	not applicable
137	Number of re-negotiations (range)	41%	not applicable	not applicable
138	Duration [years]	22%	not applicable	not applicable
139	Duration range (years)	22%	not applicable	not applicable
140	Reason(s) of renegotiation	31%	not applicable	not applicable
141	Final Outcome (impact on project budget)	7%	not applicable	not applicable
142	Final Outcome (impact on project budget) (range)	7%	not applicable	not applicable
143	Impact on costs (%)	6%	not applicable	not applicable
144	Impact on Costs (% private)	0%	not applicable	not applicable
145	Impact on Costs (% public)	4%	not applicable	not applicable
	Project outcomes			
146	Early contract termination	54%	53%	54%
147	Incentives	20%	not applicable	not applicable

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148	Conflicting pricing objectives	17%	not applicable	not applicable
149	Acceptability	28%	not applicable	not applicable
	Project outcomes (Shaded sections - Assessment with respect to transportation goals)			
150	Main project purpose for the Contracting Authority	61%	60%	61%
151	Where data are not available, specifications on travel time	39%	40%	39%
152	Where data are not available, specifications on travel cost	28%	38%	31%
153	Where data are not available, specifications on reliability	31%	33%	32%
154	Where data are not available, specifications on safety	33%	33%	33%
	Project outcomes (Shaded sections - Other details on economic, social and environmental impacts)			
155	Economic	50%	47%	49%
156	Social	50%	43%	48%
157	Environmental	50%	40%	46%
	Project timeline			
158	Project maturity - Time between Tender call and Date project conceived (range in years)	72%	30%	57%
159	Project procurement - Time between tender call and project award (range in years)	81%	17%	58%
	Performance indicators			
160	Performance indicators explicit in contract	78%	70%	75%
161	If performance indicators are not explicitly stated in the contract, are there any indicators that are used for evaluation within different stages of the project or are there any indicators used in project report?	44%	37%	42%
162	Reliability- When data are not available specify whether:	48%	30%	42%
163	Availability- When data are not available specify whether:	54%	30%	45%
164	Maintainability- When data are not available specify whether:	52%	30%	44%
165	Safety- When data are not available specify whether:	50%	27%	42%
166	Security	100%	100%	100%
167	User satisfaction	85%	93%	88%

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A.7 List of the case studies

Table A.282 - PPP cases

Project	Country	Mode	Description
Attiki Odos (Athens Ring Road)	Greece	Road	Attica Tollway is a modern motorway extending along 70 km. It constitutes the ring road of the greater metropolitan area of Athens and the backbone of the road network of the whole Attica Prefecture. It is an urban motorway, with two separate directional carriageways, each consisting of 3 lanes and an emergency lane (hard shoulder). The suburban railway of Athens has been constructed in the central reservation of the motorway. Attica Tollway is part of the PATHE road axis (Patra - Athens - Thessaloniki - Evzoni) and connects the Athens - Lamia National Road with the Athens - Korinthos National Road, by-passing the centre of Athens.
Rion-Antirion Bridge	Greece	Road	This bridge connecting the two shores of the Gulf of Patras is widely considered an engineering masterpiece. Innovative design and off-shore construction methods had to be implemented to address an adverse construction environment including the length of the strait (approximately 2,500m wide) and deep water (up to 65 m), combined with deep soil strata of weak alluviums, the possibility of strong seismic activity, tectonic movements (30 mm a year) and adverse high wind actions. It is unique as a multi-span cable-stay bridge and boasts several innovative features, such as shallow foundations on reinforced soil, a continuous and fully suspended deck for the entire length of the bridge, stay cables equipped with special anti-seismic accessories, and expansion joints which can accommodate large displacements in all directions. The seven year construction period consisted of a two- year design and preparatory works period and a five-year pure construction period.
BreBeMi	Italy	Road	Motorway A35, also known by the acronym BreBeMi connects since July 2014 the cities of Milano and Brescia with a path located further south than the track of the Motorway A4 and was built with the aim of reducing the high levels of traffic of the latter and to offer a shorter track to drivers moving between Milan and Brescia. The motorway is 62,1 km long and is managed by BreBeMi S.p.A.
Piraeus Container Terminal	Greece	Seaport	Concession of the Port of Piraeus (OLP) container terminal to Cosco Pacific, Piraeus is the largest seaport in Greece, located only a few miles from the capital Athens. The project entailed the development, operation and commercial utilization of the existing Pier II of the Port of Piraeus, as well as the future construction of Pier III. In 2009 OLP entered into an agreement with the Special Purpose Company 'Piraeus Container Terminal S.A.' (SPC) and its sole shareholder 'Cosco Pacific Limited' through which it agreed the concession to SPC of the port installations of Piers II and III and the surrounding area of the Container Terminal Facility. SPC was granted the exclusive right to use and commercially exploit the above land area and the right to use, together with OLP, the adjacent berthing manoeuvre sea area.
Horgos - Pozega	Serbia	Road	The toll motorway project Horgos - Pozega included mix of financing and construction of a new motorway section, financing and construction of the second carriageway on the existing semi-motorway section, and the take-over of an existing motorway section, in total of 323 km. Project was divided into three lots. Lot 1 Belgrade (Ostruznica

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			interchange) - Pozega: E-763 motorway has a length of 148 km. This is the new section connecting Serbia to Montenegro and to Bosnia and Herzegovina. The package for this lot included financing, design, construction, operation and maintenance services. Lot 2Horgos - Novi Sad: E-75 motorway is 107 km in length with one existing (right) carriageway. This lot included financing, design, construction, operation and maintenance of a new, left carriageway and operation and maintenance of the right carriageway. Lot 3 Novi Sad - Belgrade (Batajnica brick factory): E-75 motorway is 68 km in length. Lot 3 included operation and maintenance of the existing right carriageway and a newly build left carriageway.
Ionia Odos Motorway	Greece	Road	Ionia Odos is a toll motorway concession project of approximately 196 kilometres in length, located in Western Greece. The project also includes 183 km of brownfield sections already constructed by the Greek state under a traditional public works procurement scheme; these sections are tolled and the revenues are used to fund the construction of the new alignment. The project's construction is funded by debt and equity capital, state and EU funds, as well as tolls received during the construction period. The new motorway is designed to allow journey speed of 120 kph and its typical cross section consists of a dual carriageway of two lanes and an emergency lane, divided by a New Jersey barrier. The project includes over 42 interchanges and over 11 km of tunnels. The project includes the following parts: 1) Antirrio - Ioannina (163km): New motorway section 2) Agrinio bypass (33km): This is a motorway section that was built by the state. No tolls are received on this section throughout the concession period. 3) PATHE section Athens - Skarfeia (172.5km) and PATHE connecting branch Schimatari - Chalkida (11km)
Central Greece (E65) Motorway	Greece	Road	Central Greece (E65) is a toll motorway concession project of approximately 174 km in length, located in Central Greece. The project also includes 57 km of brownfield sections already constructed by the Greek state under a traditional public works procurement scheme; these sections are tolled and the revenues are used to fund the construction of the new alignment. The project's construction is funded by debt and equity capital, state and EU funds, as well as toll charges received during the construction and operation period. The new motorway is designed to allow journey speed of 120 km/h and its typical cross-section consists of a dual carriageway with two lanes and an emergency lane, divided by a New Jersey barrier. The project includes over 25 interchanges and over 12km of tunnels. The project includes the following sections:1) Lamia (PATHE)-Grevena (Egnatia Odos) (E65 motorway), 174km: New motorway section2) Skarfia - Raches (PATHE motorway section), 57km: This is a motorway section that will be built by the state, to be operated by the SPV.
BNRR (M6 TOLL)	UK	Road	The M-6 toll road, known as, Birmingham Northern Relief Road (BNRR) is the first toll road in the UK, built under the Private Finance Initiative programme and is an alternative to the existing M6 in the West Midlands conurbation. Background: The existing M6 motorway was in need of investment and its position as the main arterial route between the south, midlands and the north west of England meant that the volume of traffic in the future would outstrip its capacity. Increases in traffic use meant that alternative routes were required to achieve capacity increase. The New Road is a dual three-lane motorway that joins the M6 at both ends and has seven junctions with other roads.M6 Toll

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			opened in 2003 as UK first Tolled motorway. The premise of using a PPP was decided at a very early stage and the BNRR was entirely private DBFO. The motorway was conceived to relieve congestion on the existing M6 motorway system hub in Birmingham and to service occupation areas and business development. The scheme would also encourage integration to the wider European network for commercial traffic.
M80 Haggs	UK	Road	The A80 forms part of the strategic road network between Glasgow, Stirling and the North East. It is one of the most heavily used roads in Scotland, carrying both strategic and commuter traffic. The section of road between Stepps and Haggs is an all-purpose dual carriageway and is the only non-motorway section between Glasgow and the end of the M80 at Dunblane. Two alternative routes were identified and through public consultation and inquiry the development of motorway was decided as an upgrade to the existing road to motorway was the best proposal. A section of the new road was "new Build" to accommodate the expanding conurbations. That the road would service. Construction works for this particular scheme of around 20 km include: - almost 5 miles (8 km) of new dual two-lane motorway and hard shoulders between Stepps and Mollinsburn - 1.6 miles (2.7 km) of the existing A80 road upgraded to dual three-lane motorway between Mollinsburn and Auchenkilns; and - almost 4.5 miles (7.3km) of the existing A80 upgraded to dual two-lane motorway between Auchenkilns to Haggs with hard shoulders and Climbing lanes. Between Stepps.
A19 Dishforth to Tyne Tunnel	UK	Road	The project A19 Dishforth to Tyne Tunnel corresponds to most part of the A19 Teesside diversion, which runs more or less parallel to the A1. The A19/A168 between the A1(M) in North Yorkshire and the Tyne Tunnel is approximately 73.32 miles (118km) long (67.73 miles (109km) dual 2 lane and 5.59 miles (9km) dual 3 lane). The project road which has 191 structures, consists of the A19/A168 Trunk Road between Dishforth and the Tyne Tunnel, the A174 between Parkway and Wilton, the A1053 and a short section of the A66 between A19 and Teesside Park. The project was amongst a raft of PFI road projects let in the Mid 1990s and identified as part of Tranche 1A PFIs under a DBFO contract. The main element of this road was the upgrade and maintenance of a vital economic link for the Tyneside is in the North East of England. The improvement (mostly widening of the A19 to reduce accidents, congestion, air pollution, noise and vibration) is approximately 4.35 miles (7km) long and required the construction of 18 major structures. The improvement is a dual 3 and 4 lane carriageway with marginal strips over the whole length.
Metrolink LRT, Manchester	UK	Mixed	Light rail transport system which commenced in 1992 and has expanded in a further 3 phases. The project consist of a light rail transport system developed in phases either by extending the existing lines, by converting some rail lines or by building new lines. The original Metrolink was six line scheme. Five lines, which were mainly used for local traffic and could be separated from main line tracks, were chosen for conversion. They were the Altrincham, Bury, Rochdale via Oldham, Hadfield/Glossop and Marple/Rose Hill lines. The sixth line would reopen the old Midland route from Trafford Bar to East Didsbury. New street running track would provide cross city connections and ready access to the city centre. Currently the network has these six main lines.
A22 - Algarve	Portugal	Road	Motorway A22 - Algarve, known as the Via Infante de Sagres, crosses the region of Algarve longitudinally, connecting

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			the municipalities of Lagos, Portimão, Lagoa, Silves, Albufeira, Loulé, Faro, Olhão, Tavira, Castro Marim and Vila Real de Santo Anténio. The eastern end of the A22 is the international Guadiana river bridge, which is the link to the Spanish border to the motorway A-49.The A22 - Algarve concession has a total length of 127,1 km, of which 35,6 km were to be designed and built, as well as maintained and operated (from Lagos to Alcantarilha), and 91,5 km were previously existent roads which were transferred to the SPV Euroscut to be maintained and operated (from Alcantarilha to Vila Real de Santo Anténio).The A22 - Algarve motorway provides mostly 2 lanes per direction. The eastern section is part of the IP1 itinerary of the main national road network as well as the European Motorway E1. The western section is the only part of the complementary IC4 national road currently in service, as the remaining part is being re-assessed in view of environmental and strategic development issues. At the Ferreiras junction, near Faro, the A22 - Algarve crosses the A2 motorway, which connects the region of Algarve (south of Portugal) to the capital.
Radial 2 Toll Motorway	Spain	Road	This concession includes the toll motorways R-2 and a non-tolled section of M-50 loop, though there is a shared last, tolled for long distance driver and non tolled for surrounding drivers, depending on the entrance point. The concession project comprises a length of 80,7 Km in the northeast way, of which the toll road R-2 is 62,3 km long. The concession includes a 18,4 km long section of the M-50 loop in the east part of the city, between the existing A-2 and A-4 roads.The R-2 starts in R-40 ring road and ends at N-II (National Highway to Barcelona), east of Guadalajara city). The motorway has two parts, the first one (inner) between the M-40 and M-50 ring roads with a length of 10 km; and the second (the outer) from the M-50 to the N-II joining at P.K. 62, with a length of the remaining 52,3 km. This section, includes a common 7,5 km long part of M-50 that is tolled for R-2 drivers and non tolled for drivers using only the M-50.The motorway contains 11 junctions, one service area and feeding roads, and a Maintenance and Control area. The toll system includes 8 areas: 4 Trunks and 4 branches. The Radial 2 is an alternative toll road to the existing N-II National Highway in the north east area of Madrid.
Eje aeropuerto (M-12). Airport axis toll motorway	Spain	Road	The M-12 toll motorway is constituted as BOT project with main purposes of providing a direct, fast and safe access to the new Barajas airport terminal T-4 and connecting the north area around the N-1 with the south area through the M-40 ring road. Therefore, this is basically a north-south longitudinal axis that starts in the national road N-1 at p.k. 17 and finish in the ring road M-40 at p.k. 8, gaining a new access to the extended Barajas airport. The size of the road is 9.4 km of which 2.4 km consist of a tunnel under Juan Carlos I park. The project include additional works and new free access roads construction in the area (mainly improvements and extension in around 45 km) as well as environment works, accounting in total for almost one third of the investment. The M-12 Motorway, 9.4 km. long, managed by the concessionaire Autopista Eje Aeropuerto, is a high-capacity road providing fast and secure access to the new T4 Terminal of Madrid-Barajas Airport. It also offers an alternative route to the east of Madrid, connecting two important entry and exit points to Spain's capital city: the A-1 Motorway (Autovía del Norte, Madrid-Burgos) and the A-2 Motorway (Autovía del Nordeste, Madrid-Barcelona), at the M-40 intersection, and the best link between Madrid's north and south.

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M-45	Spain	Road	The M-45 project is a ring road composed of three separated concessions contracts to diversify construction risks. In total, road length is 37.1 km, going round the south of the Madrid Municipalities between the Barcelona N-II road and the Extremadura N-V national roads. This is a high capacity road that support about 70.000 daily vehicles and near 140.000 in peak hours, which includes many service and access roads. This 8.3 km section connects the N-IV with N-V. Starting at km 0 from the km 28 on the M-40 and going between Leganes and Getafe to the south and Villaverde to the north, it finishes before the junction with N-IV. The maximum gradient is 4%. The foreseen speed for the scheme being 120 km/h. This stretch of the motorways goes through an area of high density transport infrastructure. There are four junctions: the first at the beginning of the motorway linking it to the M-40; the second junction is the M-421 and M-425 access roads to Leganes which connected this municipality with the M-40 and now also with the M-45; the third junction is with the N-401, Toledo road; and the fourth is road from Getafe to Villaverde (former M-403).
Port of Sines Terminal XXI	Portugal	Seaport	The project is a greenfield container terminal BOT scheme at Sines, approximately 150km south of Lisbon, for which the concession agreement was signed in September 1999. Portuguese container traffic is fairly small, at just over 1.4m TEU in 2010, and is split between three ports of fairly equal size - Lisbon, Leixões (Porto), and Sines - and a much smaller port at Setúbal. Sines' main competitor for domestic traffic is Lisbon. The objective of the PPP was to build in four stages a container terminal with an eventual quay length of 940m, a back-up area of 36.4ha, and a capacity of 1.5m TEU p.a. The terminal became operational in 2004, and so far 730m of quay and 20.8ha of back-up area have been built, and 4 out of the 10 quay cranes have been installed. The current capacity of the terminal is 0.4m TEU.
Lusoponte - Vasco da Gama Bridge	Portugal	Road	In the early 1990s, the Lisbon urban area, south of the Tagus, was served by just one bridge to reach the city. This situation presented a major constraint on traffic, not only in the city but also between the northern and southern parts of the country. In 1992, the government decided to open a bidding process for a second bridge. This new bridge, called 'Vasco da Gama', connected the eastern part of Lisbon to the southern rim in Alcochete. A design, build, finance, operate and transfer model was set up in 1993 to build the new bridge (to open in 1998). There was a condition that the operate and maintenance of the older bridge (the 'Ponte 25 de Abril') also be incorporated as of 1 January 1996.
Coen Tunnel	Netherlands	Road	The Second Coen Tunnel project is in the Netherlands the first and largest (estimated value €300 million NPV) CD procured service-led infrastructure project in the Netherlands. It involves the maintenance of an existing, forty-year old tunnel and the construction of a second tunnel alongside the current one. Since the beginning of the 1980s, there have been plans to increase the capacity of the tunnel. These plans were not further developed until 2000, partly because of a lack of funds. In 2000, extra money was made available for improving the national infrastructure, enabling the Coen Tunnel's capacity to be expanded. The Second Coen Tunnel project is both large and complex, and involves the maintenance of an existing, forty-year old tunnel plus the construction of a second parallel tunnel alongside the current one. Widening approximately 14 kilometres of highways at the north and south entrances to the existing Coen Tunnel, and expanding the tunnel's capacity from two lanes to three in each direction plus two further reversible lanes, enabling

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			five lanes of traffic in one direction during peak hours. Coen Tunnel was open to the traffic on July 2014.
A2 Motorway Poland	Poland	Road	The A2 motorway is a key element of the road infrastructure development to connect Poland with the European motorway network. Thus, A2 Motorway is part of the Transeuropean Road Network (E30) from Cork, Ireland to Omsk, Russia and it is located in II Pan-European transport corridor. When completed the A2 motorway in Poland will run from west to east through central Poland, from the Polish-German border in Świecko/Frankfurt (Oder) through Poznań, Strykéw (Łódź) and Warsaw to the Polish-Belarusian border in Kukuryki.Nowy Tomyśl - Świecko section was the missing link between the German A12 autobahn and the existing section of the highway in central Poland.The scope of the project (Nowy Tomyśl - Świecko section) includes:" 105.9 km of the new motorway with concrete pavement, " 76 bridges and flyovers - 86 as a target," 2 Motorway Maintenance Centres," 6 complete motorway interchanges - 8 as a target (Nowy Tomyśl, Trzciel, Jordanowo, Torzym, Rzepin, Świecko)," 6 Rest and Service Areas - 10 as a target, equipped with parking lots, toilets, children's playgrounds, and 4 bars and 4 petrol stations," closed toll collection system," complete environmental protection equipment (AW SA, 2012).
Istrian Y	Croatia	Road	The Project entails the financing, design, construction and operation of the 145km long road network - The Istrian Y Motorway Project.The Istrian Y (Istarski ipsilon) is a part of the Croatian highway network, well-known as being the first public-private partnership in Croatia. The Istraian Y is 141 km long, comprising of:- a 64.21 km long section of the international motorway A8 from Matulji to Kanfanar and- a 76.79 km long section of the international motorway A9 connecting Slovenia over Kanfanar to Pula. The A8 branch has been built as a single lane limited-access road, but thepart between Kanfanar and Pazin was designed as a dual carriageway and builtso as to be able to be upgraded to a full-profile motorway. The A9 branchbetween the Croatian border with Slovenia and Kanfanar is a single lanelimited-access road, while the section from Kanfanar to Pula has two lanes.
Reims tramway	France	Tramway	The project concerns the construction of the tramway in Reims (11,2km, 23 stations and 3 "Park and Ride" areas) and the operation of the Metropolitan Urban Transport System, which also consists of an existing bus line network. This one will be re-organised to accommodate and achieve interoperability with the newly constructed tramway. The restructured bus network will consist of two strong lines of buses, seven lines of structure and bonding in bypass. The line crosses the city from north to south with two routes in the south. It serves the residential areas in the north, the central station, the city center, the area where the hospital is located and part of the University. The second route links the central station to a TGV station in the south. Along the tramway line, the urban space have been improved with the renovation of streets, the improvement of public spaces and a new modal space split for the benefit of pedestrians and cyclists. The tramway was put into service in April 2011.
Caen-TVR	France	Tramway	Caen is a medium size city (109 000 inhabitants in the city, 215 000 in the intercommunal structure) in the northwest of France. TVR is a tyre mounted guided vehicle. The line is 14,8 km long. The project include the building, operating and maintenance of the TVR and also the operating of the whole urban transport network. Urban transport network

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			operated by a private operator are very common in France. But only very few cases in which the investment is also delegated to a private actor. The agreement consists in 2 concession agreements. The public works concessionaire is responsible for :- financing the construction of the TVR,- preparing the structure, installation and sticks projects- the tests and development of the rolling stock as well as its approval (take the technical, financial and schedule risks)- heavy maintenance of TVR. The public service concessionaire runs the whole bus network, do the daily maintenance of the TVR and the whole maintenance of the bus network.
Velo'V	France	other	The public free bike sharing in Lyon, called Velo'V, is made by a network of stations which give access to a fleet of available bicycles. These bicycles, used for short-term lease, are located in the city centres of Lyon and Villeurbanne. Any potential user quickly and only with a credit card is able to :" rent one of these bikes" use it within a short space of time" drop it off any station of the network. The rental period has to be less than one day otherwise the user must pay a cash deposit. The fare system is based on subscriptions for which a user, for a period from one day to one year, is allowed to use the service as many times as he wishes. The Velo'V project is a free bike sharing system developed on the city centres of Villeurbanne and Lyon. Since 2009, this service included:" around 4000 bikes;" 348 stations which are mainly located on the city centres of Villeurbanne and Lyon (only 5 stations do not belong to these two cities).
A23 - Beira Interior	Portugal	Road	Motorway A23 - Beira Interior (E 806) crosses the regions of Guarda, Castelo Branco, Portalegre and Santarém, connecting Torres Novas (on motorway A1) to Guarda (on motorway A25). It is Portugal's third longest motorway - with a length of 217 km - and it is considered a key structural component of the national road network as it offers the fastest connection to the Spanish border of Vilar Formoso from the capital, Lisbon. Motorway A23 has two lanes in each direction, with an extra overtaking lane in sections with steeper gradients.Construction was concluded in 2003. The project incorporated some sections of the IP 6 (between Torres Novas and Abrantes) and the IP 2 (between Alcains and Fundão) roads, which belong to the main national road network and had been designed as motorways on those sections. The route crosses interesting landscapes with some sinuosity and long uphill and downhill stretches.
E39 Orkdalsvegen Public Road	Norway	Road	E 39 Klett - Bårdshaug in Sør-Trøndelag County covers a 27-kilometer stretch of the E39 highway between Klett and Bårdshaug, some 20 km south of Trondheim in central Norway. A 22-kilometer stretch has been constructed and the remaining five km improved. The new route includes a total of 10 km of tunnels and 12 bridges of which the longest is 240 meters. The up-front (2001) estimated value of the construction element of the contract was NOK 1 - 1,2 billion (approx. 125 - 150 million EUR). The operating and maintenance costs were estimated at 16 MNOK (2 MEUR) per year. In 2003 Orkdalsvegen AS (a joint company between Skanska Infrastructure AV, and John Laing Infrastructure Ltd.) and the Norwegian National Road Administration signed the agreement on designing, constructing, operating and maintaining a section of the E39 highway in the county of South Trøndelag in Norway. This was Norway's first-ever public-private partnership project. The operation contract is valid for 25 years from completion of construction in 2005, and is managed by Skanska.

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Elefsina Korinthos Patra Pyrgos Tsakona Motorway	Greece	Road	This is a toll motorway concession project of approximately 365 km in length, located in Northern Peloponnese in Greece. Several portions of the motorway are brown field sections already constructed by the Greek state under a traditional public works procurement scheme; these sections are tolled and the revenues are used to fund the construction of the new alignment. The project's construction is funded by debt and equity capital, state and EU funds, as well as tolls received during the construction period. The new motorway is designed to allow journey speed of 110 km/h and its typical cross section consists of a dual carriageway of two lanes and an emergency lane, divided by a New Jersey barrier. The project includes over 40 interchanges and over 4,5 km of tunnels.
Port of Leixões	Portugal	Seaport	This case describes the concession made in the Port of Leixões for the activities of Container Terminal and of the Terminal of General Cargo and Bulk. The contractual approach and period was similar in both concessions so they will be presented as a single case.
Via-Invest Zaventem	Belgium	Road	In the early 2000s, the area north of Zaventem Airport (or: Brussels Airport) used to be heavily congested during peak hours. The daily volume of traffic could reach 2,500 vehicles an hour, and it would only increase following the expansion of the cargo-industrial zone. To prevent the airport from bursting at the seams, the following construction works were realized: - adapting and extending junction complex no 12 on the E19 in Machelen - converting Luchthavenlaan (N211) into a main road by building a viaduct over the existing road - building a cycle bridge over the E19 - building a completely separate cycle path with a tunnel under Luchthavenlaan (N211) - overhauling the existing carpool car park and road bridge installation - repairing the existing bridge over the E19 on Luchthavenlaan. This project is unique in that its implementation is integrated into the Diabolo railway project, but both projects are being financed separately with private funds. Via-Invest Zaventem and the Diabolo project actually were two independent projects being implemented at the same time and in the same project area.
Brabo 1	Belgium	Tramway	Brabo 1 was the first PPP for public transport in Flanders. The project involved the design, financing, construction and maintenance of the civil, mechanical and electrical infrastructure associated with two separate tramway extensions in the eastern part of the city of Antwerp:- The Antwerp-Deurne section was extended to Wijnegem.- The Antwerp-Mortsel section was extended to Boechout. Additionally, the project provided for a comprehensive renewal of all associated street infrastructure (including pavements and street furniture) for motor traffic, cyclists and pedestrians. A substantial tram stabling and maintenance depot, located on one of the lines (with office accommodation) was also included. Indeed, both trajectories were extended in favour of inhabitants of the Antwerp suburbs. People living in this first "belt" of municipalities around Antwerp were looking for rapid, punctual tramway connections, since heavy traffic congestion troubled their day-to-day commuting to and from the city (Beheersmaatschappij Antwerpen Mobiel, 2013).
E18 Grimstad - Kristiansand	Norway	Road	PPP E18 Grimstad -Kristiansand is one of the three pilot projects that have been implemented based on the Public Private Private Partnership (PPP) model in Norway. The idea behind the three pilot projects has been to test whether using PPP results in increased efficiency in the implementation and operation of road projects. The operation started

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			when the road was opened for traffic in 2009 and the company is being paid an annual compensation during the minimum 25 year operating period. The road was built in 38 months. The project is part of the E18 between Oslo and Kristiansand which passes through 6 counties with a total population of 1.7 million people. Along this corridor, there are 14 cities linked to this section of the E18. This road system is one of the main connections in the Nordic link, and is of strategic importance for competitive transport corridor between the south of Norway and the European continent.
Athens International Airport "Eleftherios Venizelos"	Greece	Airport	Athens International Airport "Eleftherios Venizelos" is an unprecedented Public-Private Partnership Greenfield airport development structured and negotiated in the early 1990s. The story of this airport is widely acclaimed as a financial success, for instance, the Economist intelligence Unit in 1992 acknowledged it as "a Greek contract with a difference; the structure of the contract for the new airport could set a trend for other big projects in Europe's". It represents the first successfully completed PPP structure for a European airport. Annual throughput capacity of 21 million passengers, car parking for 6,540 vehicles, as well as ancillary facilities (fuel depts., cargo handling and maintenance areas).
Deurganckdoksluis-Deurganckdock lock	Belgium	Seaport	The development on the Left Bank of the Port of Antwerp dates back to the seventies and started from the Waasland channel with the construction of the north and south docks. In the original plans, development of the Waasland Port towards the Scheldt on the seaside was scheduled via the Baalhoek channel and the related Baalhoek lock. The Kallo Lock would thereby only function as transit lock. The seaside access was never achieved and the Kallo Lock, operational since 1983, provides the only access to the Waasland port. In 1998-1999, when the choice was made to develop the Deurganckdok, it was decided to erase the reservation area for the Baalhoek Channel from the regional development plan. The Kallo Lock is heavily occupied: 8,800 movements (123 m tons) per year. Waiting times amount to 3.5 hours. The Kallo Lock is 50% busier than the Berendrecht Lock, one of the most important locks in the Port of Antwerp. The capacity increase of the Kallo Lock is due to increasing sea traffic and an increased use of the lock by inland navigation.
Liefkenshoekspoorverbinding-Liefkenshoek Rail Link	Belgium	Rail	The harbour port of Antwerp is the most important harbour port in Belgium with a total turnover in freight of 190mil tonnage. However all the freight trains that needed to go to the Hinterland used the same railroad causing congestion and delays. For the future, the harbour port of Antwerp sees container shipping lines growing and since they need to use these railroads, a solution needed to be found. Therefore, this project was set up, the Lliefkenshoektunnel needed to solve this problem. The harbour port of Antwerp expects a growth of freight transport from by 8% to 15% in by 2020 which the new railroad will cover and make possible. For this project, LOCORAIL NV was chosen to design, build, finance and maintain the lLiefkenshoekspoorverbinding. The total cost is 980 Mill euros and the railroad is used since 9/12/2014. The Liefkenshoek Rail Link project is the largest public-private-partnership (PPP) project in Belgium
Venice offshore-onshore terminal	Italy	Seaport	In 1984 a new special 'Law for Safeguarding Venice' became reality and this Law (no. 798/1984) imposes to bring oil tankers and big container ships out of the lagoon. In 2011 the study for this project was commissioned as a part of the 2011 annual tender of the TEN-T programme. The planned offshore platform will be located 13 km from the Malamocco

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Project	Country	Mode	Description
			port where the sea has a natural depth of 20m which makes it possible for the biggest container ships to berth. The offshore platform will be connected to the onshore terminal 'Montesyndial' in Porto Marghera with a barge link. It will mainly handle oil, bulk and container traffic. The oil transport will be managed through pipelines from the platform to the onshore terminal. This new offshore terminal will be able to meet the market requirements in terms of accessibility in an innovative way. The terminal is also expected to become the central link between the existing logistics centers and the maritime traffic generated by global trade.
Metro de Malaga	Spain	Metro	"Metro de Malaga" is a light rail network serving the city of Malaga, Andalusia, Spain. The project concerns the construction of the first two lines of a new underground railway system in Malaga, one of Spain's largest cities, with a population of some 550,000 inhabitants, and the metropolitan area has more than a million. The light rail network is operated by Metro de Malaga, a concessionaire formed by the Public Works Agency of the Andalusia Regional Government, Several Important builders and Cajamar (a reginal saving bank).The first two lines (Line 1 and Line 2) of the light metro system, cover the areas to the west and south-west of the city, spanning 11.3km in total length, entered commercial service at the end of July 2014. The remaining sections of the planned network are scheduled for completion by the end of 2017 (see Chart 1 Map and lines of "Metro de Malaga).
M-25 Motorway LONDON ORBITAL	UK	Road	The M25 motorway or London Orbital motorway forms a 125-mile orbital route some 20 miles from 2 the centre of London that almost encircles Greater London, England, in the United Kingdom. The Dartford Crossing, two tunnels and a bridge crossing the Thames at Dartford, completes the loop. It is one of the busiest of the British motorway network: 196,000 vehicles were recorded on a busy day near London Heathrow Airport in 2003 and the western half experienced an average daily flow of 147,000 vehicles in 2007. In May 2009, the Agency signed a 30-year private finance contract with Connect Plus. The contract requires Connect Plus to widen two sections of the M25 (around 40 miles), and to refurbish the Hatfield Tunnel. Connect Plus must also operate and maintain the M25, including the Dartford Crossing, plus 125 miles of connecting roads at junctions. It is also required to design a solution for congestion for two further sections of the M25 (around 25 miles).
MST - Metro Sul do Tejo	Portugal	Tramway	MST - Metro Sul do Tejo is the name of the public tram service connecting the municipalities of Almada, Seixal in Portugal. MST connects Corroios (South), Caparica (West), and Cacilhas (Northeast) by three tram lines in a "Y" shaped network. Each of them uses, fully or partially two of the three links of this topology. This network presents a total of 19 stops and a total length of 22 km.The first section of MST was inaugurated in 2007 and the current network is in operation since 2008. The initial project for the system considers expansion plans to extend to all three ends of the network others municipalities of the Lisbon Metropolitan Area (Costa da Caparica / Trafaria, Setúbal, Barreiro, Moita, Montijo, and even Lisbon but those works have been suspended.
Moreas Motorway	Greece	Road	The Moreas Motorway (otherwise known as the A7 motorway) provides a link between the Isthmus of Corinth (and eventually Athens) and Kalamata and Sparti in the Peloponnese. The motorway, when completed, will have a length of

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Project	Country	Mode	Description
			205 km with two lanes in either direction separated by a central reservation. The concession includes a brownfield section of 82.6km (Corinth-Tripolis) constructed in 1992, and greenfield sections including tunnels, bridges and interchanges. It will provide safe and comfortable travel through the mountainous central Peloponnese. Several sections have been gradually opened to traffic, improving significantly the average travelling time and safety conditions. The concession was awarded in 2007 for a period of 32 years to MOREAS S.A. Remuneration is achieved through tolls.
Larnaka Port & Marina re-development	Cyprus	Seaport	For a peripheral, small and insular Member State of the EU such as Cyprus, the extension and upgrading of port infrastructure constitutes a significant factor for enhancing access capability to EU markets. The main strategic objective for a comprehensive development of Cyprus port infrastructure is the enhancement of competitiveness and effectiveness, in order to respond to the modern needs for movement of goods and passengers. Larnaka is the third largest city on the southern coast of Cyprus, with an urban population of 86.700 (2012). The Port and the adjacent Marina are situated southeast at the outskirts of the urban civic centre of Larnaka and 3,5kms away from the Larnaka International Airport (southwest of the urban area). Larnaka Port is the second in magnitude port of Cyprus. The re-developed marina will have a 500-berth capacity at the first phase and will later expand to 1.000 berths for serving boats with a minimum length of 10 metres. Vessels of the order of 30 meters will be capable of entering, maneuvering and berthing in the new Marina. It will also include the necessary infrastructure to support all kind of vessels and a new yacht club will be constructed. The estimated cost for the first phase of Larnaka Port and Marina redevelopment is about €130 million. The other two phases of the port and marina will be constructed at a further cost of €55 million.
Larnaca and Paphos International Airports	Cyprus	Airport	The Larnaca Airport opened in November 2009 and the first phase is capable of handling 7,5 mil. passengers per year. The new 100.000 m2 terminal includes 16 boarding bridges, 67 check-in counters, 5 baggage carousels, VIP and business lounges, duty-free shops as well as comfortable and functional areas offering a wide range of shops and cafeterias. The new terminal was built some 500-700 m west of the old terminal, adjacent to the new control tower and it is facilitated by an extension in the runway, new facilities for aircrafts and 2.450 car parking spaces. The runway has a total length of 3.000 m. In 2012, the Larnaca Airport served 5.166.224 passengers. There is the possibility of further expansion and construction of a second parallel runway when necessary and further development of the terminal in order to be able to accommodate 9 mil. passengers per year. The new Paphos Airport is operational since November 2008 and the new 18.000 m2 terminal can serve 2,7 mil. passengers annually. The new airport provides 28 check-in counters, 3 baggage carousels and 800 parking places shops etc. The total investment for Paphos Airport reached the €126 mil. The runway has a total length of 2.700 m. In 2011 the Paphos Airport served 2.242.797 passengers.
Herrentunnel Lübeck	Germany	other	As the deterioration of the Herrenbrücke, a bridge connecting the cities of Lübeck and Travemünde, has been detected in 1995, the city of Lübeck decided to replace the bridge by a tunnel instead of repairing or renovating the bridge. The construction of this so-called Herrentunnel was one of the first public private partnership (PPP) projects realized according to the F-model. The two concessionaires, responsible for building, financing and operating the bridge, are

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Project	Country	Mode	Description
			Bilfinger Berger and HochTief (50% each). The two construction companies won the Europe-wide tender initiated by the city of Lübeck in 1997 and signed the PPP contract in March 1999. Then, in December 1999, the plan approval procedure started and the official approval followed in February 2001.Construction works began in October 2001 and the tunnel could be finished at the end of August 2005. After having finished construction works, the former bridge was dismantled in the end of 2005. As the concession period has been fixed for 30 years, the tunnel will be given to the city of Lübeck in 2035.
Valencia Cruise Terminal	Spain	Seaport	During the last five years, the Port of Valencia has succeeded in attracting a new market of international cruise passengers. The city of Valencia is becoming an attractive tourist destination by itself so the Port of Valencia has the opportunity to become an essential call for cruises liners operating in the Mediterranean. This fact would have a significant economic impact on both the city and the region with a feedback effect on the tourist sector. Old docks currently used by passenger ferries are suitable only for relatively small ships. Therefore, operating with large cruise ships requires building new port facilities which should be both suitable in engineering terms and attractive to its final user customer segment. This motivates the investment in the project of the new Valencia Cruise Terminal. The project includes a 1700 metre long berth line with a draught of 14 metres and a surface of 5.3 hectares. Four additional berthing points will be dedicated to cruise ships calls and a new cruise terminal will be built. The Port Authority of Valencia has invested a total of 33.2 million Euros in the construction of the dock, berths, new terminal accesses, pavement, electricity, gas and other supplies installations and accesses to the berthing points from the dock.
Servici	Spain	other	Development of a public bicycle rental scheme based on a public-private sector participation model. The Seville case-study (Sevici).SEVICI is a public bicycle rental scheme, which was implanted in the city of Seville in June 2007 (see Sastre and Adame).Number of bicycles: 2.500 Parking areas: 250 Parking stations: 411. There are as many docking stations as bicycles offered. The operation is performed at the docking station itself. Each docking station has an interactive informative platform. They can use a Cycle-path track length: 120 km (not included in the tender).
Terminal Muelle Costa at the port of Barcelona	Spain	Seaport	The strategic situation of Barcelona along European cities, provides some advantages in the commerce that turns it into probably the most competitive Spanish SSS corridor. Thanks to the reorganization of the Barcelona Port in 2007, the Muelle Costa surface was liberated to undertake new uses. According to its strategic plan, Barcelona Port Authority (BPA) decided to enlarge the pier to facilitate berthing and gain an additional 4.5 hectares of surface with the final aim to dedicate the pier to Short Sea Shipping (SSS) traffic and passenger and ro-ro cargo. BPA explained this decision based on three aspects: proximity of the pier to the city -especially convenient for passengers' traffic, direct access from the urban area -allowing for easy and separated transportation of the SSS cargo- and the characteristics of the esplanade, adequate for high cargo rotation. The terminal will provide for the storage of freight, plus passenger handling facilities (a passenger terminal, and a footbridge for the access of passengers from the terminal directly to the ships). In August 2011 the concession was finally awarded to Grimaldi group.

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Project	Country	Mode	Description
Barcelona Europe South Terminal	Spain	Seaport	The remarkable growth of container traffic in the Port of Barcelona over the last years - the third largest Spanish container port, and the ninth in Europe, together with its strategic situation led the Barcelona Port Authority (BPA) to contemplate the development of a new and modern container terminal. With this new terminal, which supposed an investment close to EUR860M, the port capacity is increased from 2.6M to 5.5M TEUs. According to the BPA, the new terminal do not only contribute to the economy by increasing trade in Barcelona, but also creating 600 direct and 2.000 indirect jobs. BPA also estimates the revenues of this new capacity over EUR300M annually. After a tendering process where the operator of the existing Barcelona Container Terminal and two joint ventures compete; the one formed by Hutchison Ports Holding (HPH) and Grupo Mestre was awarded.
C-16 Terrassa-Manresa Toll Motorway	Spain	Road	The C-16 Terrassa-Manresa motorway is located in Catalonia, Spain. This subsection (48.3 out of 130 km) is a primary highway in Catalonia, the richest Spanish autonomous community. More so, Catalonia is one of the most industrialized regions in Europe. The C-16 is integrated with the E9 from Orléans to Barcelona. The motorway connects two important urban areas in northern Spain and is interconnected with principal roadways such as the AP-7 motorway, the C-25 Transversal arterial road and roads C-58 and C-55. The project was awarded in 1987 to Ferrovial S.A. with the AUTEMA S.A. (Autopista Terrassa-Manresa S.A.) established to undertake the concession. This includes Ferrovial, La Caixa, Banco Hispano Americano and Banco de Credit Catalá. The planned construction cost was EUR 115M and the initial contract duration was 35 years (1 January, 2022).Construction works were planned to last two years (December 1987 - December 1989). The section Terrassa-Manresa was operational in June 1989 while an extension Rubí-Terrassa was approved in September 1989. The entire motorway was open to traffic on 12 September 1991.
Millau Viaduct	France	Road	The Millau Viaduct is part of the A75 motorway, a 2.46km tolled bridge across the Tarn River valley in southern France. It opened in 2004 and is the world's longest cable-stayed bridge.The main objectives of the project were to provide a link in the national and international road network, and to promote economic development and tourism locally by improving access to the area. It was also intended to relieve local bottlenecks in the town of Millau. Crossing the valley presented a technical challenge and the state roads directorate, Arrondissement Interdepartemental des Ouvrages d'Art (AIOA), was involved in preparatory research, feasibility studies and evaluation of options over a period of ten years. In 1989, a route providing access to the town of Millau found local public support and was chosen over three alternatives. The viaduct has become a tourist attraction in its own right, and industrial development in the area has benefited from the 1% policy. The cost was estimated at EUR 0.4bn in 1998 (USD 0.66bn in 2010 pricesi). The final project cost was substantially less: EUR 0.345bn in 2004 (USD 0.51bn in 2010 prices), including EUR 0.025bn in state-funded preliminary design and site works.
The Oresund Link	Sweden - Denmark	Mixed	A road and rail link across the Oresund between Sweden and Denmark, consisting of a bridge 7.8km long and a tunnel 4km long. In addition to improvements to connecting transport infrastructure, associated hub development is taking place at Bridge City in Malmö and Ørestad in Copenhagen. Proposals for a fixed link date back to the mid-19th century

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Project	Country	Mode	Description
			although technical and political feasibility was often an issue. The Swedish and Danish governments agreed to build a link in 1973, but the energy and economy crisis, Denmark's decision to join the EU and increasing environmental awareness blocked progress. The option of a combined road/rail bridge gained the support of Swedish and Danish parliaments in 1990. The two governments signed an agreement in 1991, committing them both to form state-owned stock companies.
Adriatic Gateway Container Terminal	Croatia	Seaport	Luka Rijeka d.d. was originally awarded a 12 year concession relating to the Adriatic Gateway Container Terminal (AGCT) of the Port of Rijeka, which was operated by its subsidiary Jadranska Vrata d.d. In 2009, this was extended to a 30 year contract in order to facilitate the modernisation and expansion of the terminal.. Since 2010, the Rijeka Port Authority has invested in the construction of a new 328m berth with 14.2 m water depth (for comparison, the original 300m berth had a water depth of only 11.7m.). The EUR 34M investment programme put forward by Adriatic Gateway j.s.c for the period 2010-15 includes mainly the reconstruction of the terminal's operational areas and railway infrastructure, as well as the purchase of new equipment and IT upgrades.
Quadrante Europa Terminal Gate	Italy	Freight terminal	The society has been established to design and build Verona's new intermodal terminal Quadrante Europa
E4 Helsinki-Lahti	Finland	Road	A working group set up by the Ministry of Transport and Communications recommended in its final report, 26th of March 1996, that private finance would be implemented to road construction and maintenance by shadow toll option. The working group presented that the shadow toll option would be introduced. The concession contract covers upgrading the Järvenpää–Joutjärvi stretch of semi-motorway into motorway and maintaining this stretch (both the old and new carriageway) for 15 years. The cost estimates excluding VAT were 550– 590 MFIM for the construction and 10 MFIM annually for the maintenance. The construction project included- second carriageway of the motorway, 69.0 km- ramps of graded interchanges (8 pcs) and rest areas (5 pcs), 12.5 km- other public roads, 1.0 km- private roads, 7.0 km- 88 bridges- 8.5 km of noise barriers- 130 km of game fences- road lighting in graded interchanges, 15 km- 1.9 mill. m3 of soil cuts- 1.5 mill. m3 of rock cuts.
Fertagus train	Portugal	Rail	The FERTAGUS Train is the suburban rail service that runs on the Lisbon North-South rail axis, for 54km, connecting the southern bank suburbs of Lisbon to the city centre. With 4 stations in Lisbon, the service crosses the river Tagus to reach 10 other stations to the south, from Pragal to Setúbal. The Fertagus train service shares stations with the national operator services, both suburban and regional and intercity. It also has interfaces with the Lisbon Metro and buses and the southern bank's urban rail service MST, and it operates a system of feeder buses in the suburban stations as part of the concession. Initially, the rail infrastructure construction contract was to be bundled with the service. Operation began in late July 1999, with actual demand corresponding to one third of the forecast demand in the base case. In the following years, demand was again exceedingly lower than forecasts, with consequences on the

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Project	Country	Mode	Description
			financial balance of the concession that were contractually protected , generating a substantial compensation to be paid by the State to the private partner. The service extension to 6 additional stops ending in Setúbal began operation in October 2004, however the renegotiation process dragged until June 2005.
Metro do Porto S.A.	Portugal	Metro	Metro do Porto is the metro network of the city of Porto in Portugal. The project started in the 1990's, with the creation of Metro do Porto society (MP), a partnership between the central government, metropolitan and local government, plus the two other public transport companies operating in the area, which are state/public companies. MP initially granted the design, construction, financing and initial operation of the metro system to a consortium of private companies named Normetro. In 2010, Normetro's concession was replaced with a 5-year concession for the operation and maintenance of the metro network to the private consortium Via Porto. The metro is operational since 2002, with lines added in 2004, 2005, 2006, and 2011. Up to 2008, 24% of the project's budget was paid for by public money (public budget transfers, European funds, additional payments from shareholders, and compensations paid by the State for financial rebalancing), 67,5% was paid for by loans (80% of which had government guarantees), and the rest was financed through leasing. User charges have been collected since 2003 through an intermodal ticketing company which shares revenues between the participating operators in the region.
E18 Muurla-Lohja	Finland	Road	Highway no. 1 is the major road link between two largest cities in Finland, Helsinki and Turku. Section between Lohja and Muurla, comprising only one part of the full link, was the second PPP Project in the country after E4 between Helsinki and Lahti. The bidding process from call for bids to signed contract took about a year, and the contract was signed in October 2005. An SPV (Project Company) was established to take care of design, build, operation and financing of the project. The shareholders of Tieyhtiö YkköstieLtd were Skanska Infrastructure Development AB from Sweden, Laing Roads Ltd. from the UK and Lemminkäinen Plc. from Finland. The bottleneck problems of Highway 1 (E18) were known for long and PPPP was considered as one feasible means to realise the project, which was anyway on the agenda of the road administration. The concession period is 21 years and the concession expires in 2029.

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Table A.283 - Public cases

Project	Country	Mode	Description
MXP T2-Railink-up	Italy	Rail	The Project relates to the construction of the electrified double-track railway extension that currently runs to Terminal 1 of Malpensa intercontinental airport, to connect Terminal 2 as well. This connection relates to a section of new double-track line over a length of 3.8 km and also includes the construction of a new station at Terminal 2 and the relative interchange equipment. The Project constitutes the initial stage of a larger project – the so-called Global Project – which aims to connect Malpensa airport with the railway network to the north as well, so as to provide a link with the Sempione and Gottardo transalpline international lines. The railway connection has been designed for a project speed of 100 km/h and “B rank”. The planned railway section will connect up with the two existing tracks, around 250 m from the current station exit, with a diversion bend westwards.
Modlin Regional Airport	Poland	Airport	Project of building new, airport for Warsaw (capital city of Poland) and Mazovia Region for low-cost airlines and charter flights. Project based on old military runway is located 35 km from Warsaw. Frist plans assumed: - rebuilding and lengthening runway - building new taxiways and airport terminal - rebuilding existing railway siding and building railway station on the airport (both not realised) - building fright terminal (not realised). Realisation of the project was few years delayed. After few months of operation airport was closed according to technical and safety reasons. Re-opening of Airport was in June 2013, however only one airline decided to operate from Modlin Airport.
Tram T4 (Line 4 of Lyon Tramway)	France	Tramway	The project concerns the construction of the tramway line 4 in Lyon (9,5km, 18 stations). This project has for main goal to improve accessibility of the south-east quadrant of the Grand Lyon. The south end of the tramway line improve accessibility of the Minguette which can be considered as a sensitive area of the Grand Lyon. In this way, attracting the population of this area can be considered as an issue of this line. Along the tramway line, the urban space have been improved with the renovation of streets, the improvement of public spaces and a new modal space split for the benefit of pedestrians and cyclists. The tramway was put into service in April 2009. The first stage stops at the Jet d'eau station and has to be extent to the main train station of the Grand Lyon: la Part Dieu in order to reinforce this multi-modal hubs.
Sá Carneiro Airport Expansion	Portugal	Airport	The Sá Carneiro airport is located in Porto, the second metropolitan area of Portugal. It was built in 1945, under a different name, Pedras Rubras. In the mid-1950s, it went international following a runway extension to 2400m. During the 1970s, the runway was extended again, to 3480m. In 1990, there were major remodelling works, with a new terminal building, new access roads, new parking in the platform, a freight terminal and additional technical buildings for air traffic control. With those 1990 renewals, the airport was renamed Sá Carneiro. However, by the end of the decade, at 3 MPA (million passengers per year), there were already severe capacity constraints affecting airport performance and its ability to grow. There were too few check-in desks and boarding gates, the baggage handling system did not have enough capacity, there was a shortage of parking, the platform layout was not optimized, the terminal layout was too limited and could not accommodate commercial area demands, and the single curbside access was congested. The project suffered long delays and cost overruns, having been awarded in 2000, and delivered in 2007, 4 years later than projected. The airport was

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Project	Country	Mode	Description
			operational throughout construction.
Estradas de Portugal	Portugal	Road	EP - Estradas de Portugal, S.A. is the Portuguese public road concessionaire. It was created in 2007 and is owned by the State, which signed a contract with it for a concession period of 75 years. The creation of EP was coincident with the creation of the road regulator, INIR. Its object is the financing, conservation, exploitation and enlargement of the roads that integrate the National Road Network. Its mission consist in providing a quality public service contributing for the national development and cohesion. For the purposes of BENEFIT, this case can still be comparable in terms of financing and management model with single project public case studies. In this case study, the "project" consists of several pieces of infrastructure, both brownfield and greenfield. From the perspective of the EP concessionaire, it incorporates its own analysis of incentives, risk allocation and approaches to funding and financing, which evolved in Portugal and finaly stabilized in the model to which this case study will report.
OW-plan Oostende-Integrated Coastal and Maritime Plan for Oostende	Belgium	Seaport	The works for an improved port approach are part of the Public Works Plan which is threefold: 1. coastal defence: protecting the centre of Ostend against floods 2. to enable all types of vessels to enter Ostend port 3. to tackle port infrastructural works in a unified way. For tackling the sea protection, the city of Ostend will build a growth beach. In front of the seaboard, a big beach is being made. During storms, the waves are broken at this beach instead of hitting the seaboard at full force. With this, the protection level of Ostend is increased up to a 100-year storm (till level +7m at the foot of the seaboard). The ultimate goal is to protect the city against a heavy storm with a return time of 1000 years. When protecting against this, maximum between 0 and 1 litre of sea water per second and per m of seaboard can flow into the city.
Tram-Train KombilösungKarlsruhe	Germany	Mixed	The Kombilösung Karlsruhe is an innovative public transport infrastructure project with the aim to create space for increased mobility and quality of life in the city centre. The city of Karlsruhe is located in the south-west of Germany. It is the second largest city in the German Federal State of Baden-Württemberg with a population of around 300,000 people. The infrastructure project mainly concerns the inner-city centre. Both parts are necessary in order to fulfil the project’s goals. One of the partial solutions is a tram-train tunnel below the street Kaiserstrasse including a branch line in southern direction from the tram-train stop Marktplatz (market place) to the stop Augartenstrasse. The second partial solution includes an additional tram line on the street Kriegsstrasse with extensive green areas, as well as cycle paths.
Port of Agaete	Spain	Seaport	Agaete is a small village (pop. 5,600 in 2014) located in the northwest corner of the island of Gran Canaria, in the Canary Islands. Until the beginning of the 1980s the local economy was relatively isolated and cantered on agriculture, although it also had a small fishing harbour with minimal facilities for local fishermen. Since the end of the 1970s local authorities had been claiming for improvements in their small port. A first project was designed by the Spanish government in 1981 was not well received by local residents because it was based on a large dock, whose huge sea-wall had a high visual impact. Despite opposing public opinion, the works were awarded in. However, both political and social pressure increased, and the works were finally stopped to look for an alternative design, which was also heavily criticised by local authorities because it was not well connected to the village and it had to be re-elaborated again. In 1985 the regional government (Gobierno de

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Project	Country	Mode	Description
			Canarias) assumed all the competencies for small and medium-sized ports in the Canary Islands. The works were concluded in 1993, although additional improvements to facilitate its usage as commercial port were also implemented in later years.
Berlin Tiergarten Tunnel [DRAFT}	Germany	Mixed	Following the reunification of Germany and the choice of Berlin as capital city, the Tiergarten Tunnel was built to provide a road and rail link through central Berlin, connecting long-distance rail lines, freeing up road space for regeneration and redevelopment projects, and eliminating traffic through Tiergarten Park. The road is part of a federal long distance road and the rail link is part of the EU TEN-T Network, connecting long distance lines via the new Hauptbahnhof (Central Station). The main objective of the project was to improve the city s transport infrastructure to cope with expected increases in traffic volumes, and to integrate the railway into the national and European network. For the city government, it also provided an opportunity to reduce traffic and improve the urban environment in the city centre. Deutsche Bahn aimed to improve journey times and reliability. The project faced public opposition and opened, in 2006, several years behind schedule. The original plan also included a metro tunnel (which finally opened in 2009) and a city railway tunnel (yet to open).
Bundesautobahn 20	Germany	Road	The Bundesautobahn 20 (A20) is a 323km dual two-lane motorway linking the hinterland of the Baltic Sea coast to the western German and European motorway network, completed in 2005. It terminates at the A1 motorway in the west and at the A11 motorway in the east, with three major junctions providing connections to three cities, two other motorways and a new highway. A further connection to Hamburg in the west is planned. The A20 is one of a programme of 17 post-Reunification German Unity Transport Projects, the objectives of which include improving transport infrastructure in the new Federal states and encouraging economic development by linking them to centres in the old states. Its specific objectives include improving access to ports, the coast and Mecklenburg-Western Pomerania, and relieving congestion locally. The three states traversed (Brandenburg, Mecklenburg-Western Pomerania and Schleswig-Holstein) conducted regional planning procedures, involving detailed route selection within their region (taking account of specific land use objectives and local impacts), environmental impact assessments and traffic load estimates.
London Underground Jubilee Line Extension (JLE)	UK	Metro	An extension to the London Underground Jubilee Line, from Westminster in central London to Stratford in East London, the 16km JLE is one of the world s most expensive projects. The project includes six new stations, of which four provide interchanges with other LU lines, and enlarging five existing stations. It is also associated with development and regeneration initiatives at Westminster, Southwark, Canary Wharf, Stratford and North Greenwich. The main objectives of the project were to improve transport links to and from the Docklands (then emerging as a commercial office hub), Southeast and East London, to act as a catalyst for local area regeneration, to relieve congestion on river crossings and other rail lines.
TGV Mediterranean	France	Rail	TGV Med is part of the TGV Network of high speed rail lines linking major cities in France. It opened in 2001. The project includes new stations at Valence, Avignon and Aix-en-Provence, six station refurbishments and increasing the speed standard on the Paris-Lyon line to 300km/hr. It is also associated with the Euroméditerranée regeneration project in

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Project	Country	Mode	Description
			Marseille.
Météor	France	Rail	Météor is a 12km metro line running from the northwest to the south of Paris, with two terminals and seven intermediate stations. It was built in three sections, the last opening in 2007. Météor is associated with three urban development zones in the city, Paris Rive Gauche, Chalon and Corbineau-Lachambeaudie to Bercy and with the regeneration of the 13th arrondissement. The main objective of the city transport provider, RATP, was to offer alternative routes for suburban passengers and commuters, in response to increasing passenger numbers on the existing network. The project was unusual in that the decision to proceed predated the normal regional master planning process. The three sections of the project were then included in successive State-region planning contracts, setting out agreed infrastructure investments. The project is thought to have accelerated regeneration of the 13th arrondissement. Sections 2 and 3 were delayed by five years due to funding problems. A tunnel collapsed during work on section 3; construction was halted for six months to investigate the accident and the construction of a replacement tunnel caused a further three-month delay.
Attiko Metro (Athens Metro Base Project)	Greece	Metro	Athens Metro, or Attiko Metro which is the most commonly used name of this project, is one of the major infrastructure projects presently implemented in Greece and the most complex one in the transport field in both technical and planning terms. Moreover, it is ranked as one of the most important projects in Europe. It comprises an underground rapid transit system serving the metropolitan Athens area. The Athens Metro Base project had been the most important transport work carried out during the 1990s in the greater area of Attiki. The construction of the Athens Metro Base Project commenced in November 1992. The first part of Line 3 started operating in January 2000, while an additional 5km with five stations began operation in November 2000. The missing Syntagma-Monastirali (1.5km) part of Line 3 was finally brought into operation in April 2003.
Neubaustrecke (NBS)	Germany	Rail	The 177km NBS Cologne- Rhine/Main line is the first rail track in Germany to be built exclusively for high-speed passenger trains. It has reduced the journey time between the two cities by half. The line serves eight stations, including Frankfurt and Cologne/ Bonn Airports (the latter via a loop), of which five were built as part of the project. It also includes a branch line to Wiesbaden and Mainz. It is part of the European high-speed rail network linking Paris, Brussels, Cologne/Frankfurt, Amsterdam and London. The main objective of the project was to aid national and regional economic development and attract passengers from air and road travel, by reducing journey times between Cologne and Frankfurt. The line runs mostly parallel to a motorway, reducing environmental impacts. It required 30 tunnels (22 constructed by mining) and passes under motorways 15 times. Slab tracks and linear eddy current brakes are innovative technical features.
Sodra Lanken (The southern Link)	Sweden	Road	Södra Länken (the Southern Link) is an urban motorway tunnel linking major roads in the south of Stockholm. It is associated with the nearby Hammarby Sjöstad waterfront regeneration area and Årsta fältet development. The main objective of the project was to link Stockholm's major roads, relieving traffic congestion in the south of the city and consequently reducing air pollution and traffic accidents. The idea of building part of the ring road as a toll-financed tunnel emerged during the mid 1980s and was formally proposed in 1989. This solution would avoid the complex process of

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			gaining permission to build a motorway through a densely populated area and would limit the impact of increasing traffic volumes. The scope of the project was reduced in 1993, reducing the estimated cost, but cost estimates increased subsequently, perhaps due to rising wages in the construction industry in the late 1990s. However, the final project cost in 2005, SEK 8.2bn (USD 1.33bn in 2010 prices), was close to that envisaged in the financing structure agreed in 1998.
Berlin Brandenburg Airport (BER)	Germany	Airport	Berlin Brandenburg Airport (IATA-Code: BER) is an international airport under construction located adjacent to the current Berlin-Schönefeld-Airport (SXF) in Berlin metropolitan area. The transport infrastructure project Berlin Brandenburg Airport (BER) consists of the following construction activities: A new terminal is built to host an annual amount of 27 Mio. passengers per year. Its modular setup allows for an expansion to a capacity maximum of 45 Mio. passengers per year. BER has 132 check-in counters, 25 passenger boarding bridges and additional walk-boarding capacity at its north pier. The new airport has two runways (07/25) both allowing for 83 start and landing operations per hour. SXF's old south runway is refurbished and extend to a length of 3600m to become BER's northern runway. BER's southern runway with a length of 4000m is newly constructed. 82 parking positions for airplanes will be available. For passenger accommodation, four car parks with a capacity of 2.200 slots are built. In total, parking capacity will reach 10.000. , Adjacent to the airport, an area of 16ha is developed to become the airports commercial district. , An underground train station at the airport links the BER to Berlin's local public transportation system as well to long distance train service.
A5 Maribor - Pince Motorway	Slovenia	Road	A5 Maribor - Pince is the part of highway link E-W, toward Hungarian border. With the implementation of the National Motorway Construction Program in the Republic of Slovenia, motorway section Koper Lendava gained a special position of a country traffic spine, becoming also a part of the traffic route Barcelona Kijev. A part of this road from Maribor to Lendava became especially important due to increased through traffic from Eastern-European countries (especially after Hungaria, Romania and Bulgaria joined EU), that is presently directed to the trunk road G1-3. Preinvestment study was prepared in 2002 and feasibility study in 2004. The construction of 6 sections in lenght of 68,6 km was finished in 2008. The whole motorway lenght is 85,2 km. Construction of underpasses, bridges, overbridges, deviations and access roads for farmers, bridges for wild animals and creeps for amphibians was also part of the project. . .
Koper - Izola Expressway	Slovenia	Road	The section of Koper Izola expressway is a part of the future H5 expressway Koper Lucija, taking over functions of the present main road G2-111 Koper Seovlje. The section is 5.20 km long and begins on the existing four-lane coastal road at Semedela (Koper) junction and concludes with the connection to the existing four-lane coastal road at Izola. Up to the bridge over the Semedelski kanal (channel) it runs on the existing four-lane coastal road. From the channel onwards, the route begins rising slightly and goes into a two-tube Markovec tunnel, which is 2.1 km long. After leaving the tunnel, the route runs along the outskirts of the Pivol valley to the current two-lane coastal road at the industrial area Stavbenik and further in its corridor up to the connection on the existing four-lane road Izola - Jagodje.
Gardermobanen (Airport Exprestrain)	Norway	Rail	Gardermobanen AS is a state owned sharehold company which was established in 1992 to develop high speed (speed limit 210 km/hour) transportation between Oslo Central Station and the new airport Gardermoen. Totally a length of 64 km

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Project	Country	Mode	Description
			including a tunnel on 14,5 km. and an extension further up to Eidsvoll. Aim of the train was to transport in 19 minutes. Construction period started in 1994 and finished in 1999. In 1996 the Parliament decided that the development company, Gardermobanen AS, also should operate the train. During spring 1997 leakages came into the tunnel and a huge amount of extra work had to be done to tightening the tunnel.. This lead to a delay of one year, but in meantime trains used the old track around.
Athens Tramway	Greece	Tramway	The project Greater Athens Modern Tramway has a total length of about 25 Km on two lines; the one connecting the centre of Athens with the coastal avenue, passing through the densely populated suburb of N. Smyrni and the other running along the coastal avenue, linking N. Faliro with the suburbs located along the west coast of Attica (from the north to the south). TRAM SA operates using 35 vehicles, supported by a workshop depot in the area of the ex-airport at Hellinikon accessed through a 2.2 Km service line. The target of the project is the expansion of the existing transportation system in Athens, the improvement of mass transportation system and the protection of the urban environment. The expected result is considered to be the upgrading of the transport services, as well as the improvement of traffic conditions. The project aims specifically in the provision of adequate public transport in regions where it has been weak (Glyfada, Helliniko, Alimos, P. Faliro, N. Smyrni). It also contributes to the improvement of the quality of life as well as to the provision of equal transport benefits to all residents in Athens.
Warsaw's Metro II-nd line	Poland	Metro	On 8 March of 2015 first passengers of second line of Warsaw Metro was serviced. It is important developing of public transport infrastructure, connecting two parts of the city lying on the two banks of the river Vistula. The tunnel construction was executed by using the world s latest technology the drilling method that uses special circular cutting machines TBM EPB (Tunnel Boring Machine Earth Pressure Balance). The construction of stations was executed by top-down method.
Motorway E-75, Section Horgos - Novi Sad (second phase)	Serbia	Road	This project represents construction of the second phase of E-75 (M-22) motorway in the stretch from Hungarian border (Horgos) to the city of Novi Sad, i.e. construction of the second (left) carriageway lane in total length of 108km. Road direction E-75 on its direction from Hungarian border to Novi Sad is a part of former Pan European Transport Corridor X which connects Austria, Hungary, Croatia, Serbia, FYR Macedonia, Bulgaria and Greece. Nowadays it is marked as comprehensive TEN-T corridor. The stretch from Horgos to Novi Sad consists of 4 traffic lanes, 2 stopping lanes, with central reserve, and with design speed being 120 km/h. The project also includes a total of 13 pairs of bridges, 9 interchanges, 3 large fills, 1 toll gate and the other under construction, 2 lay-bys and 2 more under construction, 44 pipe, frame and box culverts, several multipurpose lay-bys with gas stations and motels. The motorway Horgos - Novi Sad was part of the scope of a concession Horgos - Pozega Toll Motorway, cancelled in 2008.
Belgrade By-pass Project, Section A: Batajnica-Dobanovci	Serbia	Road	Belgrade By-pass enables the connection among the parts of the road network from west, north, southwest, south and east. Traffic coming from the north (from Hungarian border and the city of Novi Sad) on highway E-75 is redirected on the northern city border to by-pass the city. It has connection with the highway E-70 on the western city border and continues to the south over the Sava river. It is again connected with the E-75 at the southern city border at Bubanj Potok. The last

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Project	Country	Mode	Description
			section goes towards east to Starcevo. For the design purposes, the by-pass was divided into three sections: - Section A (9.7km from Batajnica to Dobanovci); Section B (37.3km from Dobanovci to Bubanj Potok); - Section C (22km from Bubanj Potok to Starcevo).
Motorway E-75, Section Donji Neradovac - Srpska kuca	Serbia	Road	This project is a part of the Project - JUGon Former Corridor X, consisting of the following sub-projects: 1. Grabovnica - Grdelica (Gornje Polje); 2. Gornje Polje - Cariina Dolina; 3. Cariina Dolina - Vladiin Han; 4. Vladiin Han - Donji Neradovac; 5. Donji Neradovacrpska Kućaa; 6. crpska Kuća - Levosoje; Highway E-75 Section Srpska Kuća- Donji Neradovac in the length of 7.96 km was open to traffic on 14 November, 2013. The section was funded by the Republic of Serbia with the financial support of the Government of Greece within the Hellenic Plan for Economic Reconstruction of the Balkans (HiPERB The Project involves construction of highway that consists of 4 traffic lanes, 2 stopping lanes, with central reserve, and with design speed being 120 km/h. The project also involves construction of grade-separated interchange and reconstruction of the existing road M-1 into one carriageway. Project also involves projects for walls for noise reduction.
Combiplan Nijverdal	Netherlands	Mixed	A new road and railway were constructed over a distance of 6 kilometres parallel to the old road N35. In addition to this a 500 meters length tunnel that accommodates 2 train tracks and 2 x 2 lanes was constructed. The tunnel is divided into three tubes: a tube for rail and two tubes for cars. The tunnel runs through the heart of the village of Nijverdal and was placed on the old railway path. The total width of the tunnel structure ranges from about 26 m to about 36 m. The tunnel depth varies along the route between 6 m and 10 m. Local infrastructure was reallocated. Two slow traffic depressed crossings, two road bridges, two railway bridges, a railway viaduct and the necessary noise barriers were also built.
The Hague New Central Train Station	Netherlands	Rail	The Hague New Central Train Station project consists of the redevelopment of the central station and the area surrounding this. The redeveloped area has an extension of 160000 m2. 150,000 passengers use the station a day. By 2020, 350.000 passengers will use the station. The new station design takes into account such future demand. In addition, new offices, stores and homes were built. The redevelopment of the area does not only improve the transport hub, but also provides an area where it is pleasant to live, work and relax . This creates a new, attractive and versatile city town with different functions and a special appearance. Moreover, the new central will generate a significant development to the centre of The Hague. The project will also contribute to the development and integration into the city of institutional places such as the National Archive, the National Library and the Literature Museum.
RandstadRail	Netherlands	Rail	Randstad Rail is a public transportation rapid transit network in the southern part of the Randstad conurbation in the west of the Netherlands, connecting The Hague, Zoetermeer and Rotterdam. Randstad Rail is a combination of three types of transport and consists of four lines. Three are light rail and the fourth is a bus route with a dedicated road. Some parts have tram vehicles while other sections use metro vehicles. The project was conceived to provide rapid and frequent public transportation between and into the major cities in the south-western part of the Randstad region . It was also thought as a key element for the development of the southern part of the Randstad conurbation. The lines have many stations and stops. In particular, there are a few prominent stations such as Beatrixlaan Station, Souterrain Station, the Hague Central Station,

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Project	Country	Mode	Description
			Leidschenveen Station, Meijersplein Station, Blijdorp Station and Rotterdam Central Station which present captivating architecture designs and are linked with urban development and regenerations schemes.
Beneluxlijn	Netherlands	Mixed	Beneluxlijn is an extension of the Rotterdam metro network, connecting the two existing lines and connecting Rotterdam with the bordering municipalities of Schiedam and Spijkenisse. The Beneluxlijn is a purely public sector project. The total length of the Beneluxlijn track is 11.5km of light rail track. Of the total length, 6.6km are on a viaduct, 3.2km in a land tunnel and 1.7km in the Beneluxtunnel under the river (which is also used by cars). The line has six stations which have been designed by important architects. Three stations in particular are important multimodal transfer stations: Schiedam Centrum; Vijfsluizen and Tussenwater. The Beneluxlijn is part of a programme to reduce traffic jams in the direction of Rotterdam harbour, and thus the main objective was to offer an alternative to the car. Another objective was to create distinctive and individual metro stations. This was a deviation from the previous approach, which imposed a uniformity of design on the metro stations and the line. The project is also associated with one important development, the station area near Schiedam Centrum.
HSL-Zuid	Netherlands	Rail	The HSL Zuid is a high speed train line that links the Netherlands to the Trans European Network of High Speed Lines. It is a dedicated double track infrastructure project and is designed to have a maximum velocity of 300km/hour . Its main stations are Amsterdam, Schiphol/Amsterdam Airport and Rotterdam. The Breda station and The Hague Central Station are also connected to the line through shuttle trains. Antwerp, Brussels and Paris are the other international stations which are part of the line . Key objectives of the projects as stated over the years by government officials were as follows - Linking the main ports of Rotterdam, Schiphol and Amsterdam to the Trans European Network of high speed trains - Giving an impulse to economic development to the Netherlands; - Reduction of air-traffic for medium distances within Europe.

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A.8 Rebuttal

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REVIEW OF DELIVERABLE D4.1
TASK LEADER: TRT
REBUTTAL

Timeline of internal and external reviews:

- 27/06/2015 Prof. Athena Roumboutsos (internal);
- 24/07/2015 Prof. Thierry Vanelslander (internal);
- 24/07/2015 Prof. Aris Pantelias (internal);
- 15/09/2015 Prof. Athena Roumboutsos (internal);
- 21/09/2015 Prof. Rosário Macário (internal);
- 18/11/2015 Prof. Werner Rothengatter (external);
- 30/11/2015 Prof. Werner Rothengatter (external);
- 26/11/2015 Prof. Athena Roumboutsos (internal);
- 26/11/2015 Prof. Rosário Macário (internal).

The Authors wish to thank the internal and external reviewers for their comments and suggestions.

The following table describes how **comments** have been incorporated in the final document.

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Reviewer's Comments	Authors' Response
Prof. Rosário Macário[60]	
The scale of assessment (-1; +1) is used in opposite directions when assessing investment vs transport demand, for example. If this is so, the aggregate effect will be neutral.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Prof. Athena Roumboutsos[61]	
All influencing characteristics (Definition 1 - an influencing characteristic is an element that can contribute to explain deviations from expected outcomes) are cross-tabulated against the outcome variables. As the definitions, correctly suggest, there is not one influencing characteristic that will solely define the outcome but a combination of influencing characteristics. Again, it is recognised (page 33) that an influencing characteristic may be positively (negatively) associated with one outcome and negatively (positively) towards another or having no impact, as one may add. Despite this definition, in the so-called level 4 analysis, an OI indicator is developed through the summation of the 3 selected outcome variables and introducing combinations of various weightings. This combined indicator is not meaningful nor its weightings. The final conclusions are derived based on this final part of the descriptive statistics analysis.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
The descriptive statistics analysis follows a mechanistic procedure without considering or bearing knowledge of the actual cases or the particularities of the topic. For example, when in 90% of the cases construction risk is allocated to the contractor, it is obvious that cross tabulations will coincide with the overall sample and no conclusion will be drawn. The few cases (3) with construction risk handled by the public sector (rare cases and probably in violation of risk allocation stemming from design changes requested or other similar) a positive OI correlation may be a random finding that is contributed to different influencing characteristics or just an error on the side of data registration, which was never checked. However, is considered a major finding. Notably the construction per se is always handled by a private contractor, who will in all cases price the construction risk. Otherwise, it would be	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.

60 As of Internal webinar on 26/11/15.

61 As of Internal webinar on 26/11/15 and BENEFIT_D4_1_notes_to_reviewer.

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violating the basics of risk management: risk is better born by the party most capable to manage it. The greater part of construction risk is technical risk and only a contractor/construction company is capable of managing, especially when referring to infrastructure projects.	
Misunderstandings of terms used in the data collection protocols.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Prof. Werner Rothengatter[62]	Authors' Response
I Comments	
The "concerns" raise the question whether or not it makes sense to aggregate the outcome variables (level 4 of the analysis, section 7.3). The overall performance indicator is constructed by a simple adding up of the weighted outcome variables (actual vs forecast for traffic, cost and completion time). Contrasting a social welfare function the outcome variables cannot be interpreted as sub-indicators, each of them contributing a share to the total. Here each outcome variable can indicate a missing of overall performance, i.e. if one of the outcome variables does not come out satisfactory then the overall performance is at risk. This is immediately evident for revenue-based PPPs: If one of the outcome variables does not show a satisfactory result then the project can be a disaster for the private operator if he has not taken precaution measures against the risks of cost overrun, time delay or revenue losses.	Comment addressed restructuring the methodology of the Descriptive Statistics analysis. Fourth level of analysis moved to Appendix A.4. The concern on the definition of the overall outcome index has been addressed, especially in relation to the aggregation and interpretations that can be inferred to discover lessons learned.
I don't discover something to learn from section 7.3. Two conclusions are possible: Either the authors are really convinced of the value of their aggregate analysis. Then this value should be explained convincingly to the reader and section 7.3 can be left in chapter 7. Or the aggregate analysis is shifted to the appendix such that this additional work is documented although no lessons could be derived.	See the response above.
II Supplementary remarks	
Methodological problem: The authors have chosen an additive form of aggregation function. This presupposes that the three chosen outcome variables are independent from each other and missing performance with respect to one of the outcomes can be compensated by good performance of the others.	Thank you for additional explanations. See response above.

62 Expl. Comments.D4 (on 30/11/2015). Supplementary remarks as to point 4 and 5 to the Benefit Deliverable 4.1

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E.g. if actual traffic equals forecasted traffic and completion time is as planned then the overall project performance could be evaluated “good” even in the case of huge cost overruns. Such a compensation effect (assuming a constant rate of substitution) could be avoided if another type of aggregation function would we used, e.g. a Cobb-Douglas or a CES function. If an appropriate normalisation of outcomes is performed (e.g.: choosing an interval between 0 and 1) then a zero performance for one outcome would lead to a zero performance for the aggregate performance.	
Value of aggregation for lessons to be learned: The question is what we can learn from the aggregate analysis. My comment I5 suggests that the authors explain the motivation and the value of this analysis very clearly if they are convinced of this value. In comment I4 I gave the reason why I have difficulties with discovering a value of this type of aggregate analysis and expect good arguments of the authors why they think that this analysis contributes to lessons to learn from the case studies. Let me explain my reservation here in more detail. The aggregate indicator for outcome performance should allow for meaningful interpretation. In the case of PPPs the overall performance would be indicated through financial figures such as the return on capital invested and the aggregate indicator OI could be interpreted as a proxy for this financial performance. The three outcome variables should serve as sub-indicators of this proxy. But the defined outcome variables can only be interpreted as sub-indicators if they can be linked to the overall financial performance. This means: Actual traffic lower than forecast implies that revenues are lower than planned. Time delays for construction also lead to revenue losses while cost overruns reduce the profit margin. From this follows: The relative importance (weight) for every sub-indicator is different for every project. In D4.1, chapter 7.3, no attempt is made to motivate the aggregation procedure through such a reasoning and develop a normalisation, weighing and aggregation scheme on this base. The weighing of outcomes is completely arbitrary and has nothing to do with the link to financial success of a PPP. The aggregation in chapter 7.3 is mechanistic and arbitrary such that I failed to notice lessons to be learned for the case of PPP finance. In the case of public finance the overall performance would be indicated through welfare	Thank you for additional explanations. See response above.

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figures such as consumer/producer or benefit/cost surpluses and the aggregate indicator could be interpreted as a proxy for the welfare performance. The three outcome variables could serve as sub-indicators of this proxy. The following arguments go analogously to the PPP case discussed above. As the authors apply the same mechanistic and arbitrary procedure for PPP and public projects it is very hard to give a plausible interpretation for the aggregate performance indicator and the property of outcome variables as sub-indicators.	
Recommendation First of all the authors should think over the value of aggregation. If they cannot find good reasons or are unable to explain them clearly to the reader they should shift chapter 7.3 to the appendix. If they find good reasons and believe that lessons can be learned they should basically revise the normalisation, weighing and aggregation procedure such that the logics are clear and a meaningful interpretation of the results becomes possible.	Fourth level of analysis moved to Appendix A.4. Calculations of this level of analysis has been moved to Appendix A.5.
Prof. Werner Rothengatter[63]	Authors' Response
Preliminaries	
1 Executive Summary: The deliverable addresses a large number of aspects of funding schemes in the context with the performance of transportation projects. It includes statistical analysis with descriptive and partly explanatory methods based on a data set for about 80 case studies and qualitative assessments based on literature reviews and own expertise. Because of the broad scope of the analysis the deliverable is very long and it is hard for the reader to discover a clear sequence of analysis, in particular for the relationships between chapters 7, 8 and 9. I recommend to shift chapter 10 to the beginning as an Executive Summary.	The deliverable has been restructured and Executive Summary included to the beginning.
2 Structure of this review: I find the introductory chapters 1-5 in general well written. Chapter 6 could give more systematic information on the case studies. Chapter 7 appears partly very mechanistic. My basic criticism of this chapter goes analogously to the "concerns" mentioned in the notes to reviewers (see point 3 below). I had most difficulties with chapter 8. The header is very general, no introduction is given into the objectives followed, the methodological approaches are very	Chapter 6 has been extended to present more information on the case studies. Chapter 7 has been revised to present only relevant findings obtained implementing the methodology designed. Chapter 8 has been revised as explained in the responses given to the comments received on this part of the work. Comments on Chapter 7 have been fully addressed.

[63] Benefit 4 1 review (on 18/11/2015).

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heterogeneous, no links are given to other chapters of this deliverable, although some research issues are redundant with chapter 7, and no comprehensive conclusion is given with respect to the lessons to be learned. Therefore the comments on chapters 7 and 8 are more critical and detailed.	
3 Notes to the reviewer: These notes appear strange. At the beginning a brief introduction into the project and its general objectives is given as well as into the intention of Deliverable 4.1. At the end “concerns” are expressed with respect to some approaches in chapter 7 of Deliverable 4.1. It is not clear who has expressed these points of concern and whether it is expected that the reviewer gives his/her dedicated opinion to the problems identified. It is surprising that the “concerns” only relate to chapter 7 but not to chapters 8, 9 or 10. I will take up the points in a separate section and end up with my impression on the cooperation of the team and coordination of the project.	Comments in the Notes to Reviewer has been addressed.
Comments on chapters 1-5	
1 List of contents, section 1.1, unnecessary because there is no 1.	Chapter 1 does not show subsections in the new version of the deliverable.
2 Footnote on p17: IST Lisboa and TIS, same organisation	IST and TIS are different entities. The full name of TIS is “Consultores em Transportes, Inovação e Sistemas”. The acronym IST refers to “Istututo Superior Técnico, Universidade de Lisboa”.
3 Chapter 4: Literature. This chapter is very general gives only a limited scope of lessons learned through other studies. Nevertheless it can be accepted because additional information is given in the appendix and the main lessons should be worked out from the case studies.	Minor modifications introduced, further to reading checks.
4 P25, 4th para, typo(F)for	Corrected from “Value For Money” to “Value for Money”.
5 P30 methodology: Chapter 5 only introduces to the methodology of chapter 7. Chapters 8 and 9 apply different methodologies. This could be mentioned.	Changes in this respect introduced in the Executive Summary, section 2.3 and introduction of the new Chapter 8. The analysis in Chapter 8 has to be read in relationship with previous and future work in BENEFIT.
6 P32, Figure 5.1, typo Fourth level	Comment skipped, as the methodology of the Descriptive Statistics analysis has been modified. Figure 5.1 has been changed to show the first three levels only. The fourth level has been moved to Appendix A.4.
7 PP32,33, Definitions 1 and 2. These definitions are more confusing than giving clarity. An “influencing characteristic” does not need an additional definition. One could also use the terms	Comment applied throughout the text of the Deliverable. The definitions used in the final version are “influencing variable(s)” and “outcome variable(s)”.

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"influencing variable", "explanatory variable" or "exogenous variable". An "outcome variable" ("endogenous variable") does not need an additional definition. Recommendation: Take one of these notions, e.g. influencing and outcome variables and correct the text accordingly. Save many unnecessary wordings like "classification variable for the influencing characteristic" and similar. Also the headers in the following tables will become shorter and more clear.	
8 P36, Table 5.7, 2nd row: overall outcome index should be -2 and not 0, if all variables have the same weight. By the way: This seems a very simple way of aggregation and question is whether it is meaningful at all and helps to generate valuable information. Note that a different method of aggregation is applied later in chapter 7.	The fourth level of analysis has been moved to Appendix A.4, as suggested in comment IV.5 of the review. The miscalculation of the overall outcome index in Table 5.7 has been corrected.
Comments on chapter 6	
PP 37, chapter 6: The description of the case studies is a bit thin. The reader would expect a more systematic analysis of the availability of influencing and outcome variables and an evaluation of the data quality. For example the outcome variables for cost, time or traffic volume (actual vs. planned) can be measured at different stages of the planning process: initial phase, phase of approval, phase of construction start. The differences in the outcome variables can be huge such that the authors should clarify whether the case study data are comparable with this respect. The definition and measurement of the influencing variables including the necessary "manipulations" to make the case study information comparable can be given in the special sections of chapter 7 in which the cross tabulations for the variables are presented. Further problem: There are a number of projects in the data base which are still under construction. They cannot be included in the analysis for output indicators which relate actual to planned/forecasted figures. This indicates that the quality of data has not been checked carefully before starting descriptive statistical analysis.	Chapter 6 has been extended, from 2 to (approximately) 11 pages, including more description and explanatory figures. The quality of the information with respect to the three outcome variables has been checked through the timeline of each case study. Specific remarks have been added in the sub-sections of Chapter 6, where the quality and quantity of the information of the outcome variable is described. Remarks on the definition and measurement of the influencing variables have been introduced in Chapter 7, where necessary. An in-depth check has been carried out with respect to the case studies "under construction" (i.e., eight projects), or "awarded not yet started" (i.e., one project). Description of the check performed and the result obtained is presented in the final section of section 6.2.
Comments on Chapter 7	
1 This section of the review comments on the general approach of chapter 7 and refers to the "concerns" expressed in the notes to reviewers.	Comments addressed.
2 Formal points: P40, section 77.1, 3rd para, 1st line: typo analy(i)sis	Typos on pages 40, 41 and 44 corrected. Several typos on second bullet on page 44 not found; on this page there are two "second bullet" points, but

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P41, section 7.2.1, 6th para, typo Greenfield P44, 2nd para, 3rd line "distribution of the general distribution" ?? P44, 2nd bullet: several typos P60, notations: wi stands for an individual weight, while V stands for the vector of weights. The aggregation differs from that presented in chapter 6 and the question remains if such an aggregation is meaningful at all.	without typos. Concerning the notations on page 60, the methodology of aggregation has been reconsidered in Chapter 5 and the analysis (fourth level) moved to Appendix A.4.
3 The method applied is statistical cross-tabulations between influencing and outcome variables. The authors go mechanistically through the combinations of these variables which leads to the "concern" expressed in the notes to reviewers that in several cases the result of the analysis is already pre-determined by the data structure, as it is mentioned for the construction risk. This leads to the question whether chapter 7 should give an almost complete enumeration of all combinations with cross-tabulations or concentrate on the combinations for which substantial findings can be presented. These findings can consist of - non-tautological hypotheses (partly found in the literature, chapter 4) which are supported by the analysis, - non-tautological hypotheses found in the literature (chapter 4) which are not supported by the analysis. The latter alternative would be more consistent with the issue of the Deliverable to present the lessons learned.	This comment has been addressed and Chapter 7 restructured. In the new version, it presents and discusses only the cross-tabulations from which relevant findings can be inferred. All cross-tabulations of the third level of analysis are gathered in Appendix A.3.
4 The "concerns" raise the question whether or not it makes sense to aggregate the outcome variables (level 4 of the analysis, section 7.3). The overall performance indicator is constructed by a simple adding up of the weighted outcome variables (actual vs forecast for traffic, cost and completion time). Contrasting a social welfare function the outcome variables cannot be interpreted as sub-indicators, each of them contributing a share to the total. Here each outcome variable can indicate a missing of overall performance, i.e. if one of the outcome variables does not come out satisfactory then the overall performance is at risk. This is immediately evident for revenue-based PPPs: If one of the outcome variables does not show a satisfactory result then the project can be a disaster for the private operator if he has not taken precaution measures against the risks of cost overrun, time delay or revenue losses.	Supplementary remark obtained on the comment above, further to the request of clarification addressed to the external reviewer on 24th of November. The answer was received on the 30th of November. The methodology of the Descriptive Statistics analysis has been restructured to analyse the case studies till the third level.
5 I don't discover something to learn from section	The fourth level of analysis has been moved to

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7.3. Two conclusions are possible: Either the authors are really convinced of the value of their aggregate analysis. Then this value should be explained convincingly to the reader and section 7.3 can be left in chapter 7. Or the aggregate analysis is shifted to the appendix such that this additional work is documented although no lessons could be derived.	Appendix A.4. It presents the extension of the methodology of analysis of Chapter 7. The final part of Chapter 7 introduces to the possibility to aggregate and discusses the limitations of the extension proposed. The calculations and results obtained from the fourth level have been moved to appendix A.5.
IV Comments on Chapter 8	
1 Heterogeneity: While the header is most general ("Analysing aspects of interest" – by the way: were the aspects tackled in the previous chapters not "of interest"?) the contents are most heterogeneous. No introduction is given to explain the motivation and the contents for this chapter. No comprehensive conclusions and lessons learned are given. 2 Titles of projects: I only checked the titles of German projects, which are partly wrong. "Neubaustrecke (NBS)" means nothing but "new link". I checked the figures and concluded that the project is identical with the new HSR link between Cologne and Frankfurt. Therefore "NBS Köln-Rhein/Main" would be the correct name. "Herrentunnel Labeck" should read "Herrentunnel Lübeck". 3 Sections 8.1 and 8.2 extend the statistical analysis given in section 7, partly with overlapping research issues. No reference is given to similar analyses of the previous chapter, i.e. 8.1 and 8.2 stand alone and are not integrated into the general structure of the Deliverable. Section 8.3 adds information on funding sources and discusses some related issues. Contrasting sections 8.1 and 8.2 the effects of funding schemes are discussed on a qualitative level without giving any links to the previous sections or other parts of the Deliverable. This discussion is most general and partly abstracts from real world issues. 4 Section 8.1: This section aims at exploring possible relationships between project longevity and performance indicators. The term "project longevity" is misleading as only two periods of the life cycle of a project are analysed as there are the time from conception to tender and from tender to award, i.e. the time spent for planning and procurement. First of all there are big difficulties in defining the date of conception. Some projects have a long history, partly of several decades, while the database defines the time of public approval as the date of conception. This means that the data for the first	Chapter 8 has been restructured. The final version includes only the analysis on funding sources and issues (author, TIS). The analysis on "Exploration of associations between project longevity and project performance" has not been included in the final version of the deliverable. According to the decision of the author (University of Aegean), the analysis "Assessing Traffic Demand Risk Allocation" has been moved to Deliverable D4.2 Lessons Learned – 2nd Stage Analysis. Comments received from the external reviewer have been addressed by the author.

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period are not reliable at all. Secondly the time between tender call and project award can hardly be used as an influencing variable for the performance of a project. Long time needed for preparing the tender is not necessarily indicating high quality of the tender process. It can be caused by changes of the planned design, problems with political acceptance, problems with finance or problems with establishing an appropriate governance structure. Therefore the impacts of the length of the planning and procurement process can be positive or negative for the project performance. As a consequence the statistical testing is l'art pour l'art. The results show a negative correlation which contradicted the hypotheses of the authors (but not of the reviewer). The authors add that the sample size of cases might not be sufficient to draw strong conclusions. This could already be learned from chapter 7, section 7.2.3, which is not referred to.	
5 Section 8.2: Section 8.2 is on testing the influence of allocation for traffic demand risk. This is a most important issue and worthwhile to be studied beyond the cross tabulation exercises in chapter 7. The performance of a project is defined by two indicators: (1) actual traffic greater or equal to forecast for public finance, and (2) no re-negotiation for the case of PPP delivery. Actual traffic greater or equal to forecast is considered an "additional benefit". This is a fuzzy definition for statistical testing. From the political or economic points of view the definitions appear very narrow. One of the key influencing variables is "level of control". This is generated by a scoring procedure for three sub-indicators which again result from scoring procedures and compared with the actual demand risk allocation which is scored between 1 (totally public) and 6 (totally private) such that "level of control" and "actual demand risk" are measured within the same interval. The authors assume that differences between both figures are meaningful although the first is measured as a continuous and the second is measured as a discrete variable. Very strong conclusions are drawn from these differences: if they are smaller than (-1) then too much risk has been allocated on to the private sector, if they are between (-1) and (+1) then risk allocation is appropriate and if they are greater (+1) then too much risk has been allocated to the public sector. While the qualitative reasoning behind this approach is acceptable the quantitative approach includes a number of subjective manipulations of	See comment above.

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the data set and subjective definitions of thresholds. Together with the uncertainties hidden in the data set (I had mentioned the dependence of cost/time/forecast data on the phase of the life cycle) one can classify the overall approach as an interesting numerical exercise which can be used for an in depth analysis of projects after accomplishing the data base and ensuring that all data are comparable. The conclusions drawn in the assessment section 8.2.3.3 are highly uncertain and should not be over-interpreted with respect to the appropriateness of risk allocations for single projects. Example: On p96 it is concluded from the analysis that two public cases (Tram-Train "Kombilösung" Karlsruhe and Neubaustrecke) could have served as PPPs. First of all the Kombilösung is still under construction such that it is surprising that data for "actual vs. forecasted" figures are available. Secondly both projects were subject to a number of changes in all design phases and even during construction. Thirdly for both projects the planned construction costs have more than doubled. Fourthly both projects cannot be operated exclusively rather than are essential components of an integrated network. In particular in the case of the Neubaustrecke it would only have been possible to construct an availability based PPP for the construction of the project, which would have separated the construction manager completely from the responsibility for maintenance and operation, i.e. the presumed impacts of PPPs on more efficient management have to be seriously questioned. While I appreciate the numerical exercise I recommend to formulate the conclusions much more carefully and take account of the limited reliability of the data base and the manifold subjective manipulations of these data which were necessary to perform the analysis.	
6 Section 8.3 is on funding sources and issues. 8.3.1 gives an overview on the quantitative structure of funding schemes and 8.3.2 a qualitative discussion on their effects on outcomes, as for instance revenue risk or incentives. This fits well in the overall runstream of analysis. Section 8.3.2.4 is on allocative efficiency. Surprising enough this qualitative discussion starts with first-best welfare theoretical issues, i.e. setting prices at short-run marginal costs. If the assumptions for a first-best world were reality then PPP finance would not be an issue. Prices would be set at marginal costs and the resulting deficits (because of increasing returns	A new version of the analysis on "Funding sources and issues" has been incorporated in the final version of the Deliverable.

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to scale) would be covered by public subsidies. In the real world this leads to allocation failures such that second and third-best approaches have been developed. Therefore I had expected that flexible (non-linear and non-uniform) pricing strategies would be proposed which would allow project operators to adjust to demand and willingness to pay while social requirements would be met in a satisfactory way. This is not the case in section 8.3.4 and the lesson learned from the previous chapters is neglected that revenue-based PPP with some degree of freedom for the operator with respect to price setting would enhance the performance of a project. This sub-section 8.3.2.4 should be completely revised. 7 The brief discussions on acceptability/equity and value capturing are in principle acceptable. However, the list of qualitative aspects is much longer. The other aspects should be mentioned while it is not necessary to discuss all of them in depth. Examples are: incentives through appropriate contracting, incentives for better internal and external co-operation, use of advanced information systems (BIM), change management, governance structure, participation of stakeholder groups, etc., see the relevant literature. The concluding section 8.3.2.7 is a bit thin. But the question remains which lessons can be learned from the qualitative analysis in 8.3. There is no comprehensive conclusions and lessons to be learned for chapter 8.	
8 It is not easy but necessary to restructure chapter 8 in a way that it delivers clear results which can feed into chapter 9 and the following work packages.	Chapter 8 has been restructured. See comments above.
9 My suggestion: (1) Shift section 8.1 to the appendix. It overlaps with chapter 7 and does not provide new insight. The statistics is nice but l'art pour l'art. (2) Make section 8.2 a new chapter 8. It has a clear and most relevant research issue and applies a different method compared with chapter 7. The major problem which I see is the over-interpretation of results which should be avoided. (3) Section 8.3 could be integrated into a new chapter on qualitative analysis of funding schemes. Sections 8.3.1 is informative and acceptable. Section 8.3.2 is very heterogeneous and would have to be revised, 8.3.2.4 needs a major revision. Other qualitative aspects should be mentioned.	Chapter 8 has been restructured. See comments above.
V Comments on chapters 9 and 10	

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1 typos in 3rd para of section 9.2.	According to the decision of the author (University of Aegean), the analysis on “The Impact of Business Model on Performance” has been moved to Deliverable D4.2 Lessons Learned – 2nd Stage Analysis. Comments received from the external reviewer have been addressed by the author.
2 Projects: The “Tram-Train Kombilösung Karlsruhe” is still under construction. I don’t understand why it is included in the tests on performance variables “actual vs. planned”.	See comment above.
3 P134: I don’t know the term “concessioner”, do you mean “concessionaire”?	See comment above.
4 P141, Table 9.16: Typos	See comment above.
5 P149, section 9.4.2, second and fourth bullet para: numbers missing in second and third bullet point	See comment above.
6 P151, Table 9.21. The Table includes projects which are still under construction but get values for traffic and construction time indicators (Berlin, Karlsruhe)	See comment above.
7 P154: maturing period, Table 9.22: The figures for the preparation period have to be interpreted with care. Projects associated with short periods may have passed through a long period of development to achieve an accepted design while only the time after approval enters the statistics. The length of the overall planning period can have various reasons (often missing acceptability or lack of funding) and does not indicate the maturity of the politically approved project design.	See comment above.
8 P159, section 9.4.4, bottom page, wording “in 5 in 11 cases”	See comment above.
9 PP167, conclusions: Remember that the statistical analysis does not allow for causal interpretations. The limited number of observations should also be taken into account. I find conclusions like: “Regarding construction risk, the results of the analysis showed that the public party should be preferred to the contractor.” much too strong and not backed by the empirical analysis. See also below “revenue risk …. should be preferred…”	See comment above.
10 Chapter 10 on conclusions and lessons learned reads well (although including some over-interpretations) and presents a good logical order of analysis for the main part which is missing in the deliverable: - Descriptive statistical analysis (chapter 7) - Qualitative analysis (parts of chapter 8, to be extended).	Chapter 10 has been moved at the beginning of the Deliverable in form of the Executive Summary. The initial content has been modified according to the comments above.

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- Business models (chapter 9)	
This underlines that chapters 7 and 8 of the Deliverable should be restructured (see section IV of this review).	Chapters 7 and 8 have been restructured following the suggestions.
VI Concluding recommendations	
Deliverable 4.1 presents relevant and interesting aspects of transportation projects and their performance. The evaluation of a data base on large infrastructure projects is in the core and provides the basis of lessons learned, extended by the literature and own research results. However, there are some major weaknesses with the chapters 7 and 8 which need a major revision. In this context the reader does not fail to notice that the chapters have been prepared by authors of different organisations. There is no interconnection between the chapters 7, 8 and 9. This calls for a more intense monitoring and coordination of the work on the Deliverable by the work-package and project coordinators.	Deliverable D4.1 has been restructured following the recommendations of the external reviewer.
Prof. Rosário Macário[64]	Authors' Response
Lessons learned are divided in feasibility study and definition of financing schemes. The first is explained with some detail while the later is not developed. I think we need to be more systematic and give both topics and equivalent treatment.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
This is a very critical statement, I recognise, but after reading it all I must question whether statistical descriptive analysis is a good method for analysis of these cases. As I said in my previous comment to D3.1. the snapshot analysis is very often not covering the all project but instead only some contracts. Under these circumstances what is the meaning of cross tabulations? Aren't we forcing too much a quantitative way where we only have robustness for a qualitative approach?	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
The transfer from the 2nd to the 3rd level, and the 4th is unclear. In particular the outcome index.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Consequence of the previous the choice of the hypotheses to test is not clearly supported. Why these hypothesis and not others? Which rational is behind this choice.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Finally, conclusions do not flow from the previous in a obvious way.	Modifications introduced with respect to this comment have to be referred to the final version of

64 As of email on 21/09/15.

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	the Deliverable, where the comments of the external reviewer have been addressed.
Prof. Athena Roumboutsos[65]	Authors' Response
Page 28 (Methodology) it is rightfully written "to investigate what factors might have played a major positive or negative, role in determining this different performance". All influencing characteristics (Definition 1 - an influencing characteristic is an element that can contribute to explain deviations from expected outcomes) are cross-tabulated against the outcome variables. As the definitions, correctly suggest, there is not one influencing characteristic that will solely define the outcome but a combination of influencing characteristics.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Page 33 it is recognised that an influencing characteristic may be positively (negatively) associated with one outcome and negatively (positively) towards another.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Page 50 links within links and nodes within nodes are described as special infrastructure (bridges, tunnels, locks, terminals within Ports etc). In other sections they are described as parts of links and parts of nodes which may be misleading. In practice, they are unique structures in the network and commonly associated with high exclusivity.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Brownfields are existing infrastructure. Sometimes, the project concerns their improvement (only brownfield). Sometimes (very common in PPP roads and in our sample) they are combined in a greenfield project.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
(1) and (2) above if considered as parts or phased development is misleading. Relatively better performance is expected as in the first case technical difficulty generates focus on construction activities resulting limited cost and time overruns (though overshooting can also be expected) and uniqueness sustains traffic, while in the second uncertainties are limited by the fact that historical data (construction and traffic) are available.	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.
Mix-use is mostly represented by road projects in our sample. These projects are easily influenced by other characteristics as they usually do not hold an exclusive position in the network. So maybe, it is not that single user infrastructure are performing better but rather that roads are more vulnerable to the influence of other characteristics such as GDP	Modifications introduced with respect to this comment have to be referred to the final version of the Deliverable, where the comments of the external reviewer have been addressed.

[65] As of email on 15/09/15.

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(crisis) which will influence all outcome indicators. This should especially be considered as the majority of cases in our sample represent roads from Greece, Spain, Portugal, Serbia.	
Please use the proper footer - reference to the H2020 contract.	Proper footer included.
In the list of contributors, please group contributions per chapter/section of work.	Comment addressed.
Prof. Aris Panelias[66]	Authors' Response
Linguistic check throughout the document.	Thank you for the linguistic check.
Page 23 Positively or negatively?	"negatively influenced", see Bain (2009), on page 27. Paragraph Heavy/light rail.
Page 27 Are these definitions based on literature or are they proposed by TRT? If based on literature please include a reference. If proposed by TRT then clarify that these are definitions proposed by BENEFIT in order to assist with the analysis to be undertaken. Additionally, one would not usually find definitions introduced in a section of Conslusions. It would make more sense for these definitions to be included in the next chapter which discusses the methodology as part of the Introduction.	Yes, these definitions could be moved. The proposal of modification is in section 5.2.
Page 29 I think that the official term is Descriptive Statistics rather than the other way around. This should be made consistent in the entire report.	Modified throughout the deliverable.
Page 31 Shouldn't a tramway be classified as a link too? It would be better to use a port or an airport as an example of a node.	It would be better to modify Tramway into Port/Airport, to better represent a node.
Page 40 Please see my next comment regarding the meaningfulness of cross-tabulating performance measures against risk allocation. I think that for risks that are not related to the performance measure in consideration the results of such an analysis may be misleading and should be excluded from this report. This is something that needs to be further thought out.	The analysis of the results might be concentrated to the following cross-tabulations on risk allocation. Costs and time overruns: design, construction, maintenance, rev./comm. and financial. Demand: construction, maintenance, rev/comm. and financial. World Bank Transport notes 7 and 13 provide with additional hints on "whole life approach" and "comprehensive maintenance programme".
Page 41 There is a clear distinction here between construction risk in PPPs versus public projects: In PPPs the allocation of the risk to the contractor seems to produce mostly good results (64% in line, 13% below versus 23% cost overruns). For the case of the public projects the allocation of this risk to the contractor appears problematic as in most such cases we have significant cost overruns	Text modified. Other literature references might be mentioned as support and maybe included in the literature review.

66 Task4 1 Deliverable D4 1 Lessons Learned (stage 1) 20150721_TRT – APreview (on 24/07/15).

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compared to cases where risk has been allocated to the public party. This is a puzzling result however, as from a textbook risk allocation perspective the private sector is always more capable of dealing with this risk as this is the core expertise of the construction industry. It may be the case that the observed cost overruns have to do with other factors rather than construction risk materialising, such as claims for change in project scope, changes in the construction method due to changes in the design and so on and so forth. The problems about the cost overruns in public projects are very well known but the fact that we see some correlation between cost overruns and construction risk allocation does not necessarily imply causation, i.e. it is not necessarily the risk allocation that has caused the cost overruns in these projects. This is something that should not be misinterpreted when drawing the conclusions in Section 7.4.	
Page 48 Looking for a relationship between the performance of traffic demand forecasts and risk allocation is reasonable in certain cases but does not provide any meaningful input in others. I would claim that results are meaningful only when it comes to risks that have an effect on the operation of the facility, which can be directly related to traffic through the perception of the quality of service by the users. In this respect for certain risks, e.g. construction risk, it is meaningless to claim that construction risk allocation has affected the way traffic forecasts have materialised as construction takes place before operation begins and whether the private party or the public one held this risk is irrelevant to the materialisation of traffic forecasts. Consequently, the entire analysis against traffic demand forecasts needs to be reviewed from the perspective of whether the variables that are cross-tabulated have to offer a meaningful input to the understanding of performance. In certain cases they will but in others they won't and the latter should be excluded from the analysis as they may produce confusing or misleading results.	See comment above on the type of risks.
Page 52 As in my previous comment, the relationship between time overruns and risk allocation may be meaningful in some cases but not in others. The various risks needs to be considered with respect to whether they affect time overruns and those that do should be kept and analysed. The rest should be discarded as their analysis would not be meaningful.	See comment above on the type of risks.
Page 53 How was this inferred if only few	General case, public party, 4 observations are

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observations were available? This statement appears to be unsubstantiated. Overall, it appears that the numbers are quite small and inconclusive with respect to the relation between time overruns and construction risk allocation.	available, of which 1 exceed (25%) and 3 in line (75%). We can add this information, or skip the statement.
Page 56 It appears that the V_T sensitivity analysis has not been run for all cases below. Figures should be amended accordingly or this sensitivity should be excluded (and it should be explained why it was excluded).	The vector V_T has been applied to all the cross-tabulations that follow in this level of analysis. Perhaps, the text does not provide with enough clarity that results never change using vector V_T. Modifications of the text have been introduced to take this aspect into account. Another way to make it clearer would be add the figure of the distribution of V_D to the three already shown.
Page 61 I am having a hard time understanding the results from this aggregate indicator against the various risk allocations. It makes more sense to me to look for the overall project performance that this indicator aims to reflect against general project characteristics. In the case of risk allocation, as I claimed earlier, certain risks are not relevant to some of the 3 performance measures that we are considering. Consequently, I am not sure that these results can be explained in a reasonable way as the indicator is aggregated and the risks do not apply to all of its components. This analysis should be reviewed for all risks mentioned below and should be kept only for risks that affect all 3 measures of performance that form the OI.	With respect to the risks, the analysis of the fourth level considered construction, revenue and financial aspects only. The allocation of these risks might be important in relation to the outcomes assumed. To make the presentation of the analysis more linear, the cross-tabulations of the third level could be presented consistently with this section. See the reply to previous comment of the reviewer.
Page 68 This is not reflecting the true meaning of greenfield and brownfield projects. Greenfield = new construction involved; Brownfield = mature asset.	See comment below.
Page 68 This is confusing: phasing works does not have to do with whether the project is a greenfield or a brownfield one. You may have phased development in both, depending on the magnitude of works that need to be undertaken. In the first case (greenfield) you may have phased initial construction while in the second (brownfield) you may have phased asset rehabilitation or expansion, depending on the scope of works.	From the descriptions of the cases, few are greenfield and phased at the same time. The majority (seems/)regards cases that are new constructions not phased. In some projects the construction of greenfield ones has been implemented through different contracts. Using the four cost categories initially assumed, the cross-tabulation with the fields is not conclusive. Aggregating into two cost categories (threshold at 500 million) brownfield are 69% lower 500 million. With respect to greenfield 55% is higher than 500 million. The cases having both fields are 61% higher than 500 million. With respect to the physical description cost overruns are less likely for part of nodes, or links. As regards time overruns entire nodes, or links are more incline to exceed, while part of nodes, or links, are more in line with forecasts.

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Page 69 There are problems with this conclusion that stem from the fact that the analysis undertaken may not always be meaningful. Please see my previous comments regarding individual performance measures against risk allocation, as well as regarding the OI and risk allocation.	See previous comments.
Page 69 I am not sure that this assumptions has been tested as stated here. We have only tested the allocation of specific risks against specific (and combined) performance measures in a pair-wise manner. We have never tested the implications of the simultaneous allocation of all risks mentioned above against the performance measures. I would suggest that this part is reworded to reflect the analysis that has been undertaken.	This assumption has not been tested in the analysis carried out. Maybe a change from "assumption" to "statement" clarifies that this is not an hypothesis to be tested through this analysis.
Page 69 Should it be "operator"?	Contractor is the definition used in the protocols. We should maintain unchanged.
Page 69 This statement appears to be very speculative. If no such information is available (about higher charges) then it should not be mentioned.	According to the cross-tabulation between revenue risk allocation and outcome of transport demand, 42% of the observations is below and far below forecasts. This has been put in relation with findings from the literature review (Iossa, Spagnolo and Vellez, 2013).
Page 69 This statement is valid in general but it needs to be considered in light of the previous comment.	According to the cross-tabulation between type of repayment revenues and outcome of transport demand, if user charges are the only source of revenues, forecasts are below of far below in 50% of the cases.
Page 70 All contributing authors have been included in the beginning of the document. Making special reference to the authors of certain parts creates a feeling of fragmentation. The credit and the corresponding responsibility for the contents of the report goes to all contributing authors so there is no reason to make such special reference. This should not be an edited volume with individual contributions but a unified report like all previous ones.	Authors mentioned in the revised document.
Page 75 Please refer to my previous comment about authorship.	Authors mentioned in the revised document.
Page 76 We need to maintain the same format with respect to bullets and numbering.	Modified.
Page 76 See previous comment.	Modified.
Page 91 This reduction concerns the private sector (this is related to the following comment).	Comment not addressed by the author.
Page 91 Restrictions in pricing (or similar) reduce the risk control for the private sector which cannot do much to influence it. The public sector would not be influenced as it has presumably passed the risk	Comment not addressed by the author.

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to the private sector. The statement needs re-wording.	
Page 92 See previous comments on authorship.	Authors mentioned in the revised document.
Page 101 See previous comments on authorship.	Authors mentioned in the revised document.
Page 154 As the various sample sizes used for the various analyses are relatively small it should be mentioned that all findings and conclusions are indicative. Caution should be exercised when attempting to generalise and only under a good understanding of the corresponding analysis assumptions.	Footnote added.
Page 154 This sentence is complex and confusing. It should be broken to smaller and simpler ones.	Sentence shortened.
Page 154 This is a conclusion that is not corroborated by the analysis undertaken. Please see previous comments about the meaningfulness of the cross-tabulation of performance measures with risk allocation.	The conclusion is based on the cross-tabulations of the third and fouth level.
Page 155 This is certainly the case but just because the private sector may add a risk premium to handle construction risk does not mean that the public sector is more capable of handling it. As mentioned in the literature review, risks should be allocated to the party who is best able to manage them and in the case of construction this is the private party (construction contractors) rather than the contracting public agencies.	Suggested modification of the text.
Prof. Thierry Vanelslander[67]	Authors' Response
Linguistic check throughout the document.	Thank you for the linguistic check.
Various pages "To be completed".	Cross references added in the following versions of the deliverable.
Page 74 ?	Comment not clear.
Page 80 Sentence?	Comment not clear.
Page 83 Formulas not printed well.	Checked and modified.
Page 83 Variables not printed well.	Checked and modified.
Prof. Athena Roumboutsos[68]	Authors' Response
Page 18 We do not look at innovation so …	Comment incorporated.
Page 25 Please Refer this to Goran et team. Show synthesis of road sector in PPPs (EPEC reports), Road financing performance in literature with respect to: 1. Size; 2. Risks; 3. Marcoeconomic; 4. Acceptance of tolls.	No further suggestions.

[67] File Task 4.1_ Final report _v1_TV (on 23/07/15)
[68] File Task 4.1_ Final report _v1 (mail on 27/06/2015).

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Page 25 Please refer to Lourdes et team. Deregulation; market players; logistic/supply chains; intra & inter port competition.	No further suggestions.
Page 25 There is no such study.	Added the reference to COST (2013) report.
Page 25 Please refer to Rosario et team. Location; dependence on airlines; connections; macro; size.	No further suggestions.
Page 25 Please refer to Pekka Deregulation; separation of infra and operation; size; maintenance; risks.	No further suggestions.
Page 25 Please refer to Rosario et team.	No further suggestions.
Page 26 This is debatable, See trends from EPEC during the crisis.	Reference checked, but not changed.
Page 26 This is just focusing on road.	Text not modified.
Page 26 Datable see trends EPEC.	Reference checked, but not changed.
Page 26 Nevena & Athena.	No further suggestions.
Page 26 Not a good paper.	Reference skipped.
Page 26 These refs are very different.	Text rephrased.
Page 27 In the end both PPP and public end up on the same level – PPPs include the risk cost in the beginning, public over shout or »use« the clause for 30% increase in the EU directive – So ...	Text not changed.
Page 27 Please refer to Hans & Ibsen.	No further suggestions.
Page 28 Please refer to Koen et team.	No further suggestions.
Page 29 Please refer to Thierry & Koen.	No further suggestions.
Page 29 Please refer to Joao.	No further suggestions.
Page 61 The text cannot be followed with all tables in appendix.	All tables included in the Appendix.
Page 62 Please include table.	See comment above.
Page 62 This is not justified from this table.	Text skipped.
Page 63 A node within a node is a terminal and a link within a link is e.g. a bridge. Phased construction is not relevant.	Comment addressed to include the examples.
Page 68 There is a misconception of the variable – there is only one contract including various project phases.	Description on this cross-tabulation skipped.
Page 68 The deleted was already discussed.	Description on this cross-tabulation skipped.
Page 68 This does not make sense.	Description on this cross-tabulation skipped.
Page 68 These could just be in the appendix.	Moved to Appendix.
Page 70 This is not a reason for being more suitable.	Description on this cross-tabulation skipped.
Page 76 Why?	Text skipped.
Page 77 Roads are mix use projects.	Text rephrased.

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Page 83 You could however run non-parametric tests.	Chi-square test performed, but not meaningful. The sample is not large enough to be suitable for such statistical analysis.
Page 89 Are you saying that public sector bureaucrats are better suited to manage the construction risk?	Text rephrased.

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End of report

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