

HOW COUNTRIES UNDERTAKE WELL-PREPARED PROJECTS: A REVIEW ON TEN COUNTRIES

A PIARC LITERATURE REVIEW

TASK FORCE COMMITTEE 1.1 WELL-PREPARED PROJECTS



STATEMENTS

The World Road Association (PIARC) is a nonprofit organisation established in 1909 to improve international co-operation and to foster progress in the field of roads and road transport.

The study that is the subject of this report was defined in the PIARC Strategic Plan 2020– 2023 and approved by the Council of the World Road Association, whose members are representatives of the member national governments. The members of the Technical Committee responsible for this report were nominated by the member national governments for their special competences.

Any opinions, findings, conclusions and recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of their parent organisations or agencies.

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PIARC LITERATURE REVIEW HOW COUNTRIES UNDERTAKE WELL-PREPARED TRANSPORT PROJECTS: A REVIEW ON TEN COUNTRIES

TASK FORCE 1.1 *WELL-PREPARED PROJECTS*

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WELL-PREPARED PROJECTS LITERATURE REVIEW

It is well acknowledged that good project preparation tends to deliver better outcomes (benefits) as well as providing good project management performance (with respect to budget, delays and quality). This report presents processes put in place in 10 countries to deliver well-prepared transport projects.

This literature review is the first task force deliverable, and it aims to identify good practices found in countries of different income levels and moreover of different cultures. All ten members of the task force was asked to describe their country's processes. A template was prepared so all members had a common framework.

Analysis of this data was done in several steps going from a country by country basis to a cross-countries analysis, and then finally a high-level analysis to offer an integrative synthesis with key points.

Overall, the literature review helps identifying the following observations:

- There are a wide diversity in processes, methodologies and tools used in the ten countries that we studies but all of them go through a systematic overall process for a well-prepared projects.
- National cultural aspects should be taken into consideration in the prepatation of projects. In other words, there is no such thing as a global unique way of doing the preparation of project. Transnational guidelines in the preparation of project should be kept at high level, in terms of principles of metarules.

However, limitations must be taken into consideration in the reading of this report:

1. This report does not include countries in the middle-lower and lower income levels.
2. The details reported here for countries is the standardized approach to the preparation of their transport projects¹. There might be some gaps with what is really done.
3. The literature review included in this report refers to the process that is generally carried out in each country. It should be borne in mind that this process may vary in each country depending on whether the project is developed in the private sphere (e.g. a PPP project) or in the public sphere, and in the latter case there may be variations depending on the administration that develops the project (ministry, regional entity, city council, etc.). This report refers to the preparation of projects developed in the public sphere.

¹ As is explained in the Introduction, in this report we adopted the term "transport projects" and "Transportation" instead of "Road projects". This approach reflects the orientation of many countries and of PIARC to embed the roads development within a larger transport ecosystem.

EXECUTIVE SUMMARY

4. For the purposes of this report, the project starts at the moment the political decision is taken to build a road infrastructure, up to the tender phase for the construction work.
5. PIARC structure encourages participation of national level in the transportation system. However, transportation projects are often delivered by regional and/or local administrations. The report covers processes as they are documented at the national level, but does not specifically cover regional and local processes.
6. The coronavirus pandemic has had two major impacts on the task force work program. The first impact was on the consideration of Development banks. It was not possible to reach out to individuals in development banks: work done at distance did not allow for meetings and encounters that would have led to information from them. A second impact of pandemic was the limitation on having remote team-meeting via video conference. The task force workplan including a face to face team meeting in Quebec in October 2020. This was replaced by two series of virtual meetings. No doubt, goals were achieved in terms of basic content, but it did limit the exploration of other innovative avenues.

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1. INTRODUCTION

It is widely recognized that good preparation of infrastructure projects, first and foremost transport projects, is of utmost importance to secure their proper financing, wide acceptance, and seamless implementation. In the current context of a pandemic, many countries invest massively in infrastructure transport projects to boost their economy (in all types of country: industrialized, emerging, or developing). It appears more than ever that we need to know more on the preparation of projects – and more likely well-prepared projects. The main reasons are as follows:

- Improved acceptability by all stakeholders (e.g. by populations directly affected by social and environmental aspects of the project, or by donors or public authorities participating in the cofinancing);
- Improved quality and resilience of the projects, to meet Sustainable Development Goals;
- Reduced risk of delays and cost overruns in construction and its possible impacts on maintenance.
- Improved transparency in the procurement process and ethical behaviour of all parties.

For complex projects (typically PPP or concession projects), in addition to the above-mentioned reasons, it is necessary to:

- Explain to stakeholders the need to recourse to these complex procedures.
- Minimise transaction costs and standardise contract documentation as much as possible.
- Attract financing at favourable terms and conditions and sustainable funding.
- Overcome project complexity, while accepting innovative solutions.

In this report we refer to transportation and to transport projects instead of road projects. In our view, many countries members of PIARC have adopted this approach in changing the name of their department from road denomination to one of transportation. PIARC has also enlarged the sense given to the association to include not only roads, but train and so on. Moreover, road construction is currently generally understood as a global transportation need and has often to be considered in the country transportation context. In addition, with the engagement of the majority of countries in the climate change and in the CO₂ emission, needs for road are now regarded globally within transportation sustainability including cycles and pedestrians. To that the technology also tend to go towards a global view of transportation, and not only of roads.

But there is very little known² on the preparation of projects. Moreover, the preparation of a project brings some ambiguity: What is the exact meaning of “project preparation”? How do we know it is “well-prepared”? When does it start in the context of a public project? When does it finish? As we can observe, there are several relevant questions that need to be answered.

For the members of the task force, it appears very clear that the first step should be to know how different countries manage the preparation of their transport projects. As a starting point, countries

² Please, see the document on the scientific literature review for more details.

from team members were the targeted ones. The document Terms of Reference for this task force is included in Appendix A.

The purpose of this report is to provide a good representation of how countries do the preparation of their transport projects.

The structure of this report is as follows. In the second chapter, the methodology is presented in detail covering the strategy for data collection and for data analysis. Following are two chapters on our results. Chapter 3 presents the overall view of the processes implemented in our ten countries and considers them against 15 dimensions. Chapter 4 analysed the results using the three criteria of acceptance, bankability, and governance. The limits of this study are presented in Chapter 5. Then, the report concludes on some remarks and thoughts for next steps.

2. METHODOLOGY

Methodology for a literature review varies depending on the objectives of such a review. In this case of documenting the processes for well-prepared projects in a sample of countries, we draw our overall methodology design on a questionnaire (or template) for data collection and data analysis.

2.1. STRATEGY FOR DATA COLLECTION

2.1.1. Questionnaire

The questionnaire was developed to capture the different dimensions of the practices related to the preparation of projects. It was built from the well-recognised practices in countries of different income levels. The questionnaire was validated and updated by the members of the task force team. The questionnaire can be found in Appendix B.

In the first part, the questionnaire covers contextual aspects of each country as these aspects appear to be of crucial importance in the preparation of projects. It also includes a description of the overall framework or structure for the preparation of project. In all cases it took the form of figures with a certain number of steps, but always describing processes as they unfold progressively in time from the idea to the start of the execution.

Following is the detailed description of the processes and procedures in place in each country. There are 14 dimensions which offer a good coverage of what activities go on in the preparation of transport projects. Finally, there is a series of five open questions on the overall process and the issues occurring in the process.

Overall, the questionnaire offers a good representation of how different countries undertake the preparation of their transportation projects. Questionnaires were completed over a period of approximatively three months between April and June 2020.

2.1.2. Participating countries

In this first phase of data collection, ten countries are represented in the Taskforce 1.1. on Well-prepared projects. Figure 1 shows the distribution of participating countries regarding the level of their income.

High income	Upper middle income	Lower middle income and low income
Canada-Québec	Chili	
France	China	
Poland	Mexico	
Spain	Romania	
Sweden		
UK		

Figure 1 List of participating countries in data collection

As one can observe, no countries with lower levels of income participated in the first phase of data collection. Clearly, this is a limitation of this first phase. Our engagement for the second phase of

data collection, is to engage with and seek input for countries with lower levels of income. To reach this objective, the questionnaire will be simplified and will be available in the three official languages at PIARC: English, French and Spanish.

2.2. STRATEGY FOR DATA ANALYSIS

As can be observed, answers to the questionnaire are given mainly in words which call for qualitative analysis. Members of the teams worked individually and collectively to make sense of all the answers. A meeting dedicated to the data analysis strategy was held among the president and the three secretaries, then presented to team members who fully agreed with it. The following is the result of this concertation.

2.2.1. Analysis of country' frameworks for the preparation of transportation projects

This was the first analysis done. The data took the form of figures where preparation of projects was presented in different phases. The main issue in this analysis was to integrate the ten different views, each one having its own conventional way of naming the phases. We came up with an overall understanding which covers the reality of the ten unique framework and structure. See section 3.1 and Appendix C for the resulting view.

2.2.2. Analysis of the dimensions

The second phase of analysis considered the 14 dimensions of the preparation of projects, each dimension was analysed through the 10 different countries. The analysis was spread over the team members for a full coverage of the dimensions. First, a tool was developed using an Excel sheet and an example was provided to help a common understanding of the approach. Then, each team member worked individually to deliver a draft of the analysis on the Excel sheet which was then discussed in our monthly meeting. There were a couple of iterations to achieve a final synthesis. See section 3.2 for the resulting synthesis.

2.2.3. Cross-analysis through criteria of acceptance, bankability, and governance

This last analysis aims at anchoring our analysis to the criteria stated in our Terms of Reference: acceptance, bankability, and governance. Again, the work was spread over the team members, keeping the same dimensions as in the previous analysis. The objective was to explain how the preparation of projects as documented in the countries' frameworks deliver (or not) acceptance, bankability, and governance. See Chapter 4 for the resulting analysis.

3. RESULTS FROM FRAMEWORK AND DIMENSIONS

This chapter aims at describing how the ten countries participating in the task force engage in the preparation of their transportation projects. This chapter is structured in three sections. The first section proposed an integrated view of the different frameworks in use in our different countries. It is followed by the analysis of the stand-alone dimensions associated with the work done during the preparation of a transport project. The last section covers the analysis of the process-oriented dimensions.

3.1. THE OVERALL PROCESS FOR PROJECT PREPARATION: AN INTEGRATIVE VIEW

The stages for project preparation vary across the countries considered within the literature review, both in terms of naming and extent. To provide a common integrated structure the approach and phases for each country were considered and synthesized into a single structure as outlined below.

1. **Overall transport network planning and scheme identification** – the initial stage of understanding the needs and undertaking strategic planning of the network.
2. **Feasibility study** – early studies to understand the problem in more detail, consider high level concepts and test the viability.
3. **Preliminary design for impact assessment and consents** – preliminary design to identify land requirements, undertake environmental impact assessments, prepare initial programmes and budgets, and obtain relevant consents and permissions.
4. **Detailed design/design for construction/works planning** – design, preparation, and procurement to inform and allow the construction of the works.
5. **Construction/works** – the construction phase where the works are undertaken and completed on site.
6. **Operations, maintenance and closeout** – the final phase of the project where the construction works are completed, handover over for operations and maintenance, and construction contracts closed.

A more detailed comparison of the integrated lifecycle against individual countries is provided in Appendix C.

3.2. ANALYSIS OF THE STAND-ALONE DIMENSIONS

There are seven dimensions which are covered in this section. Appendix D presents a synthesis of all answers provided by the ten countries.

3.2.1. Environment, Sustainability and Social assessments

This dimension is a complex one as it includes several elements dealing with a diversity of stakeholders. It includes three different but complementary assessments undertaken usually at the feasibility and preliminary design stage of a project. It is sometimes difficult to have a clear separation between these three assessments, as very often the environment assessment will include the other two. However, we have covered separately below as each assessment does have a specific perspective on a project.

3.2.1.1. Environmental assessment

Environmental Impact Assessment (EIA) is a significant part of project development process. In most countries EIA guidelines are regulated by law. Although we can recognise various procedures, the objectives are common:

- anticipating,
- preventing,
- mitigating, and
- compensating the negative environmental impact of the investment.

The European Union (EU) member countries must follow procedures set up at EU level. The process is carefully followed especially if EU funds are engaged. To meet high environmental requirements EIA should provide information on the five major following topics:

- The project description and its important features.
- Possible direct and indirect impact of the investment on; citizens, health, biodiversity, land, soil, water, air, climate, material goods, cultural heritage, and landscape;
- What measures are to be undertaken to avoid, mitigate or compensate significant negative effects on the environment.
- Public consultations.
- Alternative ways of completing the task.

Road administrations emphasize the importance of all actions undertaken to protect the environment. The more developed countries engage more resources to minimize the impact on the environment. Carefully conducted EIA minimizes the risk of unexpected obstacles on the further stages of the project.

3.2.1.2. Sustainable development

Sustainability is generally defined by an equal importance given to economic, social, and environmental issues. Within our assessment we found two groups in relation with sustainability. Group 1 (two countries) do not yet include sustainability in the preparation of projects. Group 2 (eight countries) include sustainability by means of law or regulation. France and Canada-Quebec offer a good example with their law on mobility.

In the second group of countries sustainability development is embedded in the global environmental assessment, and national laws regulate the sustainability procedures. However, in some countries, the term “sustainability” is clearly identified as to be included in the environmental assessment, but there is nothing specific in the environmental assessment to cover properly this element. In this regard, Spain provides exception to this situation with specific consideration for sustainability. For example, Spain refers to the EU Legislation (EU 98/2008/CE) and a Spanish Law on the management of construction and demolition waste for which specific report must be prepared at the project level. In addition, Sweden has with an integrative approach to sustainable development called “the four step principle”. Indeed, the environmental assessment and required parts of the Swedish environmental law are integrated in the project planning process.

In the two countries pertaining to the upper middle income level countries, Mexico has no dedicated activities specific to sustainability. China has an overall plan for energy-savings and low-

carbon efficiency in the transport system, and the National Highway Network Planning (2013-2030) contains actions for sustainability. Projects must contribute to sustainability development by energy-savings and low-carbon efficiency in the transport system.

In conclusion for sustainability:

- Generally, it seems that sustainability as such is not clearly differentiate from "Environmental Assessment".
- For the countries engaged in sustainability, there is law, regulation, or directive to provide an overall national framework.
- In general, sustainability is closely embedded in environmental assessment.
- Regardless of the income, some countries do have specific and target actions regarding sustainability: Spain with waste management and China with energy saving and low carbon.
- Overall, at the project level, preparation of project, few details on how this is done except for Sweden (included in the project planning process), UK (in all project phases).

3.2.1.3. Social Value Assessment

Both groups (High and Upper Middle-Income Countries) include this parameter at the preliminary stages of their projects. In fact, several countries have literature and guidelines to apply the social value assessment, the main measured parameters are items like impact in local culture, ethnic and religious customs, population profile, local economy, etc.

3.2.2. Stakeholder and Public Engagement

Most countries consider stakeholder and public engagement as an important part of project preparation. In the democratic countries stakeholders have huge power and can significantly influence the investment. Consequently, this influence is stronger the greater the resistance to the project. In extreme cases it can result in withdrawal of the project.

On the other hand, the stakeholders can initiate the investment and even put pressure on decision makers to get the investment started. This doesn't exclude the need for public consultation.

Spreading the information about the project is a risky and uncomfortable action. However, the experience shows that it is the best way to recognize the risk and introduce adequate risk management process.

At the beginning of the project the stakeholders should be carefully considered. There are typically three groups of stakeholders:

- Decision makers (ministries, administration, utilities owners)
- Impacted directly by project (civil society)
- Others (NGO, entrepreneurs)

The main idea of stakeholder and public engagement is the same:

- To identify stakeholders
- To identify their needs and expectations
- To collect data, information about the area
- To gain information about strong opposition to the project
- To gain a support of local government

This is a part of the legal process or/and of risk management. For instance:

- France – legal path
- Spain – legal path and risk management
- Sweden – legal path as part of EIA
- Poland – legal path and risk management
- UK – legal path and risk management
- Romania – legal path as part of EIA
- China – risk management

Road administrations in developed countries are aware of the importance of Stakeholder and public engagement and therefore keep them informed throughout the whole planning process.

3.2.3. Technical Standards and Approval

According to the information received, all countries use their own technical criteria, however these technical regulations of each country are similar depending on the type of path being considered.

Technical guides and standards available for all technical domains (structures, pavements, culverts, geotechnical, design speed, number of lanes, road width, seismic standards, tunnels, traffic engineering and facilities along the route).

These technical standards are made public in countries such as Spain, Sweden, China and Mexico, based on AASHTO and European directives, some examples are, AASHTO (road design) Eurocode, Road Safety Standard -Directive 2008/96 / EC -, some tunnel standards -Directive 2004/54 / EC), construction products -UE 305 / 2011-) Road safety standard (Directive 2008/96 / EC), part of) and construction material (UE 305/2011). The standards and guides are public, and the links are available and published in its original language: For example: <https://www.mitma.gob.es/roads/normative-tecnica/> (Spain); and <https://puben.trafikverket.se/dpub/sok> (Sweden).

All countries use their own technical criteria but these technical regulations are based in AASHTO and European directives, however some technical guides and standards depends on the type of road being discussed and have some peculiarities, specifications and domains such structures, pavements, tunnels, traffic engineering, etc. it is of vital importance that each country's priority is to comply with the quality of the road work and its particular requirements. Depending on the technical level, the approval process requires compliance with some process and the approval responsibilities are shared or in some cases in hierarchical order, such as the Ministry of Transport; Director General of Roads; Deputy Director of Road Projects; and local offices of the transport department.

3.2.4. Economic Assessment and Modelling and Traffic Modelling Robustness

3.2.4.1. Economic assessment

The economic assessment of infrastructure projects in different countries is generally included in the evaluation element of the project engineering feasibility study report. The procedures are basically the same, and the evaluation models are similar.

An example is the economic assessment of infrastructure projects in China which follow the national regulations and guidelines. Currently, it is based on the "Construction Project Economic assessment Methods and Parameters" (Third Edition), including "Several Provisions on the Economic assessment of Construction Projects", "Construction Project Economics Three parts: Evaluation Method, "Construction Project Economic assessment Parameters". The key aspects of the assessment include;

- the purpose of formulation,
- the scope of application,
- the status and role of the assessment,
- the definition and content of the assessment,
- the selection, principles, and depth of the assessment,
- the conclusion criterion of the assessment,
- the selection and measurement of economic assessment parameters, and
- management and interpretation authority, implementation management and supervision, etc.

In addition, a discount rate is used to reflect the time value of funds. The choice of discount rate is related to key factors such as inflation, exchange rate, and capital supply. A appropriate discount rate is the key to the results of the economic assessment for the entire life cycle of the project. In China the social discount rate of construction project economic assessment is set at 8%, and in the EU at 5%.

Benchmark analysis of infrastructure has been stimulated by the European policy of deregulation of transport markets, the opening of markets to new entrants and separation of infrastructure. Recent infrastructure benchmarking studies, which are mostly based on statistical data compiled by UIC, demonstrate a variety of performance measures, assessment methods. The results suggest no clear interdependence between the organisation model of the infrastructure industry and its efficiency.

3.2.4.2. Traffic modelling robustness

The analysis of the information included in the responses to the questionnaire prepared by the task force, identified some common elements in terms of traffic modelling:

- Traffic studies take place throughout the early phases of the project, specifically in the "Problem identification" and "Comparing and Appraising Options" phases.
- The methodology adopted is quite similar in all countries, and includes the use of traffic models that are validated through calibration with traffic surveys of the current road network. In this sense, apparently there are not major differences between High-income or Upper Middle-income countries.
- Traffic modelling results are considered in the following tasks:

- Identification of the sections of the network in which action is required (Problem Identification).
- Selection of the optimal route alternative since traffic study evaluates the suitability from a functional point of view of the future road.
- Analysis of investment efficiency.
- Pavement section design.
- Environmental assessments (noise studies).

In addition, some differences were also identified:

- In countries where risk analysis is carried out, the result of the traffic study is a critical input. Risk analysis is not carried out in some of the surveyed countries.
- In some countries (France, UK and Sweden), the results of traffic studies are used to carry out air pollution or carbon footprint assessment.
- Starting from an apparently similar methodology, some countries have national guidelines that include specifics in the methodology that must be followed. This is the case in France, Poland, Spain and UK. These national guides basically include the basic parameters to consider, such as:
 - Type of model.
 - Study area.
 - Traffic growth assumptions.
 - Margin of uncertainty, acceptance criteria.

Finally, the traffic study is a critical aspect in the management of projects that are going to be financed through a PPP scheme (Private Public Partnership), since traffic magnitude reflects the demand that the future infrastructure will have to accommodate, and therefore, the expected income through toll.

3.2.5. Cost, Budget, and Risk Management

There is a range of approaches to cost, budget and risk management for the different income level countries. Most of the countries have a well-documented process for estimated costs and the follow up costs at different stages of a project.

3.2.5.1. Costs

Canada-Quebec have a "directive" for projects over \$100M covering all stages, and similarly France and Spain have templates and process to support the development of costs. In Poland, costs are clearly part of the multicriteria assessment for the selection of the best options. Sweden and UK have strong documentation. Specifically in Sweden, each project must document precisely how the cost, budget and risk will be managed over the project life cycle, and in UK an optimism bias allowance is included in the assessment.

In the two upper middle-income countries in this category, there are differences in what is documented here. China seems to follow well documented process and monitor any significant costs differences at different stages in the preparation of projects.

3.2.5.2. Risk and Risk Management

Level of risk management varies from one country to the other. Strong risk management processes were identified in the literature review in Canada-Quebec, France, Sweden and UK. Noteworthy, a presentation was given in the team workshop in October 2020 on risk management. China also follows a well-structured process for the assessment of risks level for particularly complex projects. Risk is also assessed on social stability in China.

3.2.6. Procurement and Funding Routes

3.2.6.1. Funding routes

The following definitions and context have been used in the consideration of funding routes.

- funding refers to the entity that eventually provides the money for the infrastructure; for roads, there are basically only two possible sources of funding: taxpayers (who provide money to public entities) and road users (through tolls). Both sources can be mixed in some projects.
- financing refers to the intermediaries that provide money for the construction/maintenance period (typically annual public budgets, private banks, financing institutions such as development banks, etc.)
- some languages (e.g. French) do not make a clear distinction between funding and financing, since they only use one word (“financement” in French), which may entail confusion in some cases.

For all countries, the main share of funding comes directly from public entities (taxpayers), with only a small part possibly financed through toll concessions (payment by road users), usually for large motorway projects.

Public funding may be shared between different public authorities (e.g. France: co-financing between the State and local authorities; Mexico, which outlines that federal procedures apply as soon as federal money is involved).

Most respondents also mention the intervention of financing institutions, such as EIB (European Investment Bank) for European Union (EU) countries, or other Multilateral Development Banks (World Bank, Interamerican Development Bank, etc).

3.2.6.2. Procurement

Procurement is typically governed by national laws and regulations.

EU countries are subject to EU Legislation (Directives 2014/23/UE on the award of concession contracts; and 2014/24/UE on public procurement). While general principles apply in all EU countries, such as equal treatment, non-discrimination, mutual recognition, proportionality and transparency, procurement details may differ slightly from one another. For instance, while Design-and-Build procurement is allowed in some countries (United Kingdom), it is virtually impossible in France, where allotment is a general rule (in order to protect SMEs) and architects and engineering firms want to remain independent from construction companies.

In addition to the answers provided through the questionnaire, additional research is required for developing countries which may rely heavily on International Financing Institutions for works financing. Specific points that are considered relevant for these countries are.

- While funding from road users may be an option for these countries, such issues as toll acceptability and low traffic volumes may make it often hardly practicable, which leaves funding from public sources by far the main option.
- As far as procurement is concerned, Multilateral Development Banks have supported for a long time the use of FIDIC-type documents (FIDIC is the International Federation of Consulting Engineers). Quite recently, for instance, the World Bank has modified their Procurement Framework, in order to modernize it, put greater focus on value for money, provide more ways to bidders to differentiate bids, and bring more opportunities for dialogue and discussion³.
- Multilateral Development Banks and some Bilateral Development Banks consider recommending the use of the new FIDIC 2017 suite of contracts. In particular, the World Bank now considers the FIDIC 2017 Suite of Contracts (Yellow, Red and Gold Book) as a standard, complemented by their COPA (Conditions of Particular Application). Other MDBs are drafting their own COPAs.

Finally, one should also mention SOURCE, the MDB-supported software for project preparation. Analysis of SOURCE is another topic to be considered by TF 1.1 as part of the terms of reference and will be considered in another section.

3.2.7. Construction Strategy

The analysis of responses in relation to construction strategy identified several different procurement routes, which can impact on parties involved in the construction strategy. The different variants that occur are the following:

- Design bid build (DBB)
- Design build (DB)
- Early contractor involvement (ECI)
- Public-private partnership (PPP)

In Canada, there is also a variant called

- Accelerated bridge construction (ABC)

Both private and government are involved in planning, management, development process, design, environmental quality and specified within the "Terms of Reference". The detailed construction strategy is typically determined by private contractors or construction companies, but with key input from the client and public partners.

The strategies vary between the countries and we can state that not all countries have a national strategy for how road investment projects are to be implemented. In those countries that do not have a national strategy, the form of contract is decided based on the local conditions in the current

³ See for instance:

<https://www.worldbank.org/en/projects-operations/products-and-services/procurement-projects-programs>

<https://www.worldbank.org/en/projects-operations/products-and-services/brief/procurement-new-framework#SPD>

project. Another conclusion we can draw is that the choice of contract form is related to the size and complexity of the project. DBB for the smaller and not so complex, DB for the slightly larger and slightly more complex projects and that ECI and PPP are used for the largest and most complex projects.

It also seems to be that PPP is used to contract competence for the implementation of the project as they do not always have adequate competence within the ordering organization.

3.3. ANALYSIS OF PROCESS ORIENTED DIMENSIONS

3.3.1. Problem Identification

3.3.1.1. Holistic Transport approaches

Most countries consider that road project preparation starts from the moment a political decision has been made to launch a specific road project, with a view to solving a previously identified transport problem. Some countries however tend to have a more holistic view, notably by assessing whether an identified transport problem could be solved otherwise, in a multimodal approach.⁴

For instance:

- *France* recently passed a “mobility law” applicable to all transport authorities aiming at solving identified issues such as:
 - Everyday transport
 - Ecological transition
 - New transport modes, etc.

This law however is too recent for having produced any visible impact on problem identification, let alone project planning.

- *Spain* has a National Planning Programme that covers all the country and several means of transport.
- *Sweden* adopts a four-step principle, whereby the first one consists in a rethink i.e. whether the identified problem can be solved in a different way, e.g. by using a different mode of transport.
- *UK* considers a pre-project phase (Strategy, shaping and prioritization), whereby solutions to the identified transport problem are investigated and assessed, including, but not limited to, road network solutions. The road project is initiated if deemed the most viable solution to the transport issue.

⁴ This parallels a trend observed in some countries to have road administrations restructured within or alongside multi-modal and integrated transport agencies.

This topic was analyzed by a PIARC Technical Committee during the Cycle 2012-2015 (see report at <https://www.piarc.org/ressources/publications/9/25491,2016R23EN.pdf>)

One of their conclusions was:

Structural reform, with the road planning, design, construction and management functions incorporated into an “integrated transport agency” is only one model for achieving multi-modal integration. However, internationally, such agencies are the exception rather than the rule and highly related to place and local context. Such a reform is a possible condition, but not necessarily a pre-requisite for multi-modal integration (provided there is recognition of the overall need for integration as a standing function).

3.3.1.2. Road transport approach

In other countries, it seems that problem identification is based mainly, if not solely, on the collection of data pertaining to the road network itself, such as:

- Road inventory (e.g. for functional capacity)
- Condition appraisal (structural capacity and surface condition, based on network testing and inspection)
- Traffic data (current and predicted)
- Safety data
- Congestion data

Possibly complemented by the assessment of economic data (such as real estate developments, accessibility to the road network, etc.). This data is in turn used to establish the planning of works for years to come.

3.3.1.3. Planning

Most countries have a National Road Program (e.g. Poland, Spain, Sweden, China, UK, Mexico), spanning over five (Poland) to 12 years (Sweden). These programs are committing, subject to actual budget availability.

Road authorities at lower level may depend for their financing on National budget subsidies. For instance, in France, regions do not have a road network of their own, but may participate financially in other road authorities' works program ("Contrat de plan Etat-Région" = State-Region Planning Contract), so that financial difficulties at State level may delay projects at lower level.

3.3.1.4. Summary

Trying to adopt a global view, it seems that, at least for the countries considered, but possibly also for developing countries, the main trend in project preparation is marked by increased complexity.

In the past, in the countries considered and elsewhere, project preparation would commonly be defined from "products" (e.g. feasibility study, project detailed design, etc). Each of these products marking the term of a stage and allowing to carry on with project implementation (notably with land acquisition, project financing, etc.).

Meeting the term of these stages is still a requirement, for obvious governance and legal reasons, but the focus has shifted from the "products" to the "processes". Today, a much larger number of stakeholders have their say in the identification and definition of the project until its final approval. Their involvement is not limited to a single stage but may be continuous and iterative over the project preparation period. This is because of a growing attention paid to social and environmental issues, beyond strict economic issues. Consultation of all stakeholders is required, which takes time, sometimes years, without guarantee of final success.

In addition to the points considered through the questionnaire, some developing countries depend heavily, if not exclusively, on financing from Development Banks (either bilateral or multilateral) for their road investment operations. These Development Banks usually consult with the country and between themselves to solve the country's transport problems globally. A greater emphasis is being placed on solving connectivity issues, rather than a piecemeal approach of financing individual projects. As a result, transport problems are not considered only at national level, rather at a wider

regional level. This is particularly important for landlocked countries. These banks may also co-finance projects, which in some cases may entail further delays for all loan approvals required.

3.3.2. Considering Breath of Outcome

Many of the countries reviewed have a standard approach for identifying and considering the breadth of the problem, and the potential outcomes. The analysis of the different countries' approaches highlighted several common elements, including.

- Economy – the impact of the scheme on the local and wider economy
- Social – the positive or negative impact of the scheme on local communities (e.g. noise and air quality) and the wider benefits to society.
- Environment – the impact and outcomes associated with the natural environment (e.g. biodiversity, flora, fauna, landscape)
- Technical – the potential effectiveness of the scheme, including consideration of multimodal solutions and consideration of the transport systems.

The extent to which these aspects are specified within standards or laws varies country to country as outlined in other sections above. The analysis did highlight several countries undertake the consideration of outcomes, and objective setting, in collaborative manner with input from stakeholders. A specific example identified was in Wales the 'Future Generations Act' requires projects to consider the broad impact and outcomes a scheme may have.

3.3.3. Comparing and Appraising Options

The typical approach to comparing and appraising options is to use some form of multi-criteria assessment. This is usually based around the key themes associated with the planned outcomes and undertaken multiple times within the project development process. The appraisal of options typically requires some levels of design, which increases in detail through the different stages. Stakeholder and public consultation are also common to inform the assessment of different options.

Several countries also have a framework for considering which options or measures should be promoted. A specific example highlighted within the literature review was the Swedish 4-step principle, which seeks to promote measure within the framework as summarised below.

1. Rethink/remove need.
2. Optimise the existing transport network.
3. Make alterations or undertake minor works.
4. Major rebuild or extension

3.3.4. Programme Management

When we study the answers that we have from the different countries, we can state that there seems to be a clear structure for how planning and management of the projects should be carried out. There are well-described processes with clear decision points, milestones that must be passed. We can state that the process differs depending on size.

The government owns the "go"-decision for the largest projects. After that the national administration together with a procured supplier can execute the project. With decreasing size of the projects, the "go"-decisions are delegated down to different levels in the organization that is

responsible for the execution of the projects. It is also clear that in connection with procurement of suppliers, responsibility is delegated for the management of the supplier commitment.

The schedule seems to be important from the beginning of the project to get the critical path for the different stages. In each stage the schedule is updated and extended regularly.

In upper middle-income countries, it appears that the programme management is decided on a national level (maybe the government) at the beginning of the project, and this seems to be the case for the monitoring of the projects also. This means that the conditions for implementation will be clear to the suppliers and that there will thus be a clear framework for the tender work. However, one risk with the management being at a high national level is that there are fewer opportunities to adapt the working method to the project's conditions and that the responsibility is thus delegated upwards.

3.4. COMMON ISSUES ENCOUNTERED - OVERALL

As part of the review of the processes adopted in each country, the task force members also discussed the main problems they encounter in the preparation of their transportation projects. The points listed below should be taken into consideration to enhance the overall performance of these projects.

- Existing ground conditions - services utilities, ecological conditions, protected areas, and landslides.
- Political decisions and changes in direction during various implementation stages.
- Stakeholders objections to the project in its entirety, or as the preferred route to have a project cancelled ("Nimby" attitude);
- Overarching objection to road transport (and road projects) as one of the main contributors to CO2 emissions.
- Contractor financial problems and objections/challenge during procurement.
- Arrangements with utilities owners to divert apparatus impacted by the project.
- Lack of cooperation between local authorities and central government.
- Costs and schedule deviation due to:
 - Fulfilment of law requirements (public consultation processes, Road Safety Audits, etc.),
 - stakeholders' objections management, and
 - time invested in the supervision process.
- Changes in the construction strategy to adapt to available equipment.

For upper middle income countries, besides the common technical issues presented above, the politically driven decisions for selection of projects, the lack of budgetary resources and lack of proper local contractors have been highlighted. Although they have a huge demand for new road transport routes, they are facing several other issues:

- Political pressure to promote a certain scheme, usually linked to local politicians and / or contractors.
- Lack of communication between central government and local authorities, as well as other stakeholders.
- Omissions in the design.

- Changes due to the contractors' method of works.
- Stakeholders modifications.
- Delayed land acquisition process.

4. ANALYSIS BY CRITERIA: ACCEPTANCE, BANKABILITY AND GOVERNANCE

This chapter aims at describing how the 14 dimensions of the preparation of projects relate to the criteria stated in our Terms of Reference: acceptance, bankability, and governance. The objective was to explain how the preparation of projects as documented in the countries' frameworks deliver (or not) acceptance, bankability, and governance.

The definition of these criteria use by the task force is summarised below.

- *Acceptance* refers to the achievement of as wide a consensus as possible on the implementation of a project. While it is seldom possible to reach unanimity among all stakeholders ("NIMBY syndrome", not in my backyard), it is indispensable now in all countries to achieve such a reasonable consensus and avoid authoritarian decision-making, regardless of the development level of the country, since:
 - i. industrialized countries have developed legal frameworks that allow for all types of stakeholder consultation and recourse; and
 - ii. developing countries often rely for their projects on International Financing Institutions that scrutinize environmental and social aspects of a project before financial approval.
- *Bankability* refers to the capacity of the country to obtain adequate financing for the project. If the project is financed on budget resources, it needs to obtain the relevant appropriation from the Ministries involved. If the project is financed by International Financing Institutions, it must meet their requirements. But the concept of bankability is even more important when the project is financed with some sort of private financing (Public-Private Partnerships or concessions) by private banks and/or sponsors.
- *Governance* brings together the two aspects mentioned in TF 1.1 Terms of reference, namely accountability and transparency.

4.1. ANALYSIS OF THE STAND-ALONE DIMENSIONS

4.1.1. Environment, Sustainability and Social

4.1.1.1. Environmental assessment

Acceptance

A better understanding of the environmental impact and measures undertaken to protect the environment, will support wider acceptance of the investment. The acceptance is sought through the legal EIA process which has requirements associated with anticipating, preventing, mitigating and compensating the negative impact of the investment on the environment. Only if EIA is approved, accepted by appropriate administrative body, the process of planning can be continued.

Bankability

Where an investment is planned to be funded by external resources a lot of focus is put on meeting all the environmental requirements, and carefully undertaking the EIA process. Any oversight may result in refusal to finance or withdrawal of funds.

Governance

The system of transparency and accountability around Environmental Assessment is ensured by legal procedures. In most countries the scheme promoter or investor is responsible for the process of approval of EA. The process itself and decisions made by investor or administrative body are publicly available, and stakeholders and citizens have access to them and the right to raise an objection.

4.1.1.2. Sustainable development

Acceptance

In the current context where the United Nations have published their 17 sustainable development goals with clear objectives, each country is starting to actively consider their transportation projects against these goals. Given the large commitment of the countries to these goals, acceptance of a transportation project is becoming related to how the project contributes to sustainability.

Bankability

In the same vein, bankability is only possible for transportation projects that show how they will contribute to sustainability.

Governance

Governance mechanisms put in place at the early stages of a project should show how transparency and accountability will be performed and maintained during the execution phase of a project.

4.1.1.3. Social value assessment

Acceptance

To consider the social value of a project it is necessary to consult the main stakeholders to see the level of satisfaction with the project developed, and understand and validate their acceptance. All countries have in their procedures the requirement to undertake public consultations, which include the ability for stakeholders to propose and request changes to improve their level of acceptance. The principal topics that influence the acceptance of the project are:

- Omissions in the project design.
- Delays in the implementation of the project.
- Level of acceptance of the modifications proposed by the main stakeholders.

Bankability

The bankability of the project will be affected by the level of changes and or acceptance following public consultations. Projects which have high levels of acceptance, or have incorporated changes, are likely to have less risks associated with delivery.

Governance

There are different parameters used by countries to measure social value, however the main parameters are impact on local culture, ethnic and religion customs, population profile, and local economy. The transparency of these parameters is outlined in the different guides and procedures established in each of the countries analysed, which should be publicly available so that stakeholders can comment knowing the relevant aspects of the project being considered.

4.1.2. Stakeholder and Public Engagement

Acceptance

There are two types of project acceptance:

- Stakeholders and public, and
- Legal and formal acceptance.

Stakeholders and public acceptance is crucial from a wider social context, but also from a risk management point. Road investments have huge impact on environment, including citizens. It is highly unlikely that full acceptance of a project will be achieved. However, early information, listening and explaining is the way to recognize and influence stakeholders' attitude towards project in order to seek acceptance. This approach at least makes sure people are aware of the project and can make people less wary of a project and reduce the risk of extreme opposition.

In stakeholder and public engagement transparency plays an important role. Engagement with stakeholders through public consultation, public debates and the legal process are key aspects of the process. Openness, communication and access to relevant information is also a key element of acceptance. Lack of information is often a reason for conflicts, opposition and the view that people are trying to hide a potential impact of the investment.

The legal path of acceptance is through countries and companies introducing appropriate independent legal and internal procedures of acceptance, to minimize a risk of late objection or even withdrawal from the project. This is to ensure adequate stakeholders and public engagement, clarity around forthcoming changes and to build trust to public institutions. It also helps dealing with objections and other stakeholder related issues.

Bankability

There is a strong link between transparency, acceptance, and bankability. In case of strong objections to the project the investment risk is increased and financing institution more reluctant to invest resources. Stakeholder and public participation in a planning stage is often a requirement for successful investment.

Governance

Stakeholders and public engagement is a crucial part of governance. In most countries decisions are made considering stakeholders comments. The process and decisions are public, although it is not always guaranteed by law. Road administrations are aware of the risks related to stakeholders and therefore puts a lot of focus on recognising the needs and expectations of citizens. A good governance strategy towards stakeholders requires planning, risk management and performance management with respect of parties' opinions and expectations.

4.1.3. Technical Standards and Approval

Acceptance

Technical standards and their approval ensure a minimum level of provision and compliance. This both ensures acceptance and alignment with the wider transport network, but also ensure the safe and efficient network society demands, ensuring a project has the desired life span and that they meet the required quality.

Bankability

Technical standards and approval not only ensure acceptance, but also provide confidence in terms of bankability. Depending on the type of road and the source of financing, projects with a high specifications and technical approval, would represent better investments especially where costs may be recovered through the tolls.

Governance

The appropriate technical standards and approval form a key part of the governance provide by road administrations to ensure consistency and robustness across their network and multiple projects. Ensuring an equal level of standards and base requirements are provide on all projects.

4.1.4. Economic Assessment and Modelling and Traffic Modelling Robustness

4.1.4.1. Economic assessment

Acceptance

Economic assessment generally incorporates special evaluation procedures in the engineering feasibility study stage. Typically, the society and the public are not very concerned about the detail of the economic assessment of the project, however a strong economic case can assist in clearly demonstrating the need for a project.

Bankability

Investors are concerned about the investment benefits and returns and therefore the quality of economic assessment is important in the decision-making process. The economic assessment is largely determined by traffic volume, technical difficulty, project scale and project investment.

Governance

In terms of governance, during the construction process, project management must be strengthened, changes must be reduced, investment control must be done well to prevent cost overruns. In China, five years after the project is completed and opened to traffic, a post-project evaluation will be conducted, and a comparative analysis will be made between the economic assessment and the initial project decision.

As financing issues become more prominent, project economic assessment should be paid more and more attention.

4.1.4.2. Traffic modelling robustness

Acceptance

Regarding social acceptance, as the traffic study is carried out in the early stages of the project, it is usually included in the documentation that explains the purpose and need to carry out a Project, which is used in discussions with stakeholders and citizens.

Bankability

Regarding bankability, traffic studies are critical. Three cases can be distinguished:

- Road Infrastructure that is financed through national budgets: the traffic study is a key piece related to prioritizing projects, as it is a critical data to assess the economic and social efficiency of the project.
- Infrastructure that is financed through Development Banks. In this case, the traffic study conclusions are critical to manage financing, as it impacts on two aspects:
 - The functional analysis of the infrastructure, and therefore, in its contribution to the economic and social development of the region where the infrastructure will be built.
 - The profitability and efficiency of the investment required.
- Infrastructure that is financed through a PPP scheme. In this case, traffic is the critical data that provides the potential expected income. The more robust the traffic study is, the lower the risk is assumed by the operator and, therefore, the lower the financial contingency should be foreseen, expediting financing from private banks.

Governance

Traffic analysis helps to ensure that transparency and good governance criteria are followed, since it helps to verify that political decisions are not arbitrary but are oriented to solve current functional problems in the road network.

4.1.5. Cost, Budget, and Risk Management

Costs, budget, and risk management all have relationships with acceptance, bankability, and governance.

Acceptance

There are at least two aspects to consider in respect of costs and budget regarding acceptance.

Firstly, in the preparation of a transportation project, the expected costs and budget of a project may create concern from stakeholders if these costs appear excessive in comparison to funded of other priorities such as health and education. Increases in the consistent parts of infrastructure projects over time requires good strategic planning at the country level to ensure availability of materials, labour and machinery.

A second aspect to be considered within the preparation of a project, is the quality of costs estimation, specifically with respect to the costs of the construction phase. Historically the cost of projects have been seen to increase in the construction phase, creating reluctance and lack of confidence in the management of these projects.

A good risk management process in the preparation of projects should help avoid large cost increases or delays. There will always be a chance of unexpected risks occurring, but effective management of the majority of risks will help improve acceptance.

Bankability

It is obvious that good cost estimation and budget preparation will improve the bankability of a project, improving the attractiveness of a project to good financial organisations. In almost all countries, there is competition for funding of transportation projects, and good risk management at the preparation of project plays an important role.

Governance

Transparency and accountability are two crucial aspects in the cost and budget preparation, and in the construction phase. There are often some challenges as transportation projects are interlinked with political agendas with individual countries, and effective governance frameworks provide transparency to decision making processes.

4.1.6. Procurement and Funding Routes

As far as funding routes are concerned, the main point regarding the three criteria is to make sure that there is a clear understanding (and possibly a consensus) among stakeholders about who will eventually fund a project, i.e. taxpayers or road users. Where funding is ultimately through toll collection, there is a need for transport authorities to clearly explain why that is the appropriate approach for a given project.

Similarly, as far as procurement is concerned, it is necessary to clearly explain how bidding procedures are organized in such a way as to guarantee “value for money”. Competitive bidding is therefore recommended in all cases. The scope of bidding (national versus international bidding) is also important and often specified by law (e.g. European directives) or by International Financing Institutions. There may be cases where the type of financing (e.g. by bilateral donors) impacts procurement procedures (e.g. bidding restricted to companies from the donor country – “tied aid”). Procedures should be as transparent as possible, in order to avoid any kind of wrongdoing and/or corruption.

4.1.7. Construction Strategy

Acceptance

In the construction strategy, social acceptance is particularly important, especially in the toll roads that in Mexico many people do not agree to be charged on the roads. The opposition may be to not sell the land for the construction of the road, or to argue that the construction affects the environmental impact in the area. In Mexico, the law does not make it mandatory to consult with society when a project is to be made, there is only public consultation for environmental permits.

In other countries consultations are made, this allows to agree with society the project, avoiding disagreements, and delays in its construction.

Bankability

As for Bankability, in the case of construction of highways are made in Mexico through private financing through concessions or PPP, The government of Mexico uses tax resources from taxes for the maintenance of highways, modernization or extension of these roads and state and rural roads. It does not finance highways, which are privately owned.

In the case of modernization and extension of roads that are made with tax resources, and because of the low budgets, these works take several years to be completed because they are subject to the budget allocation for each year.

Governance

As far as governance is concerned, governments must pay attention to all the requirements of society, and with respect to roads, it gives priority to maintaining toll-free roads and rural roads.

For this type of work, public tenders are made for private companies to win the tender for the maintenance of roads or for the modernization or extension of an existing road that requires improving its safety or expanding its capacity. In the case of highways or large road projects, the government bids the private sector for the concession to build, maintain and operate that road. The project is done by the private sector and is responsible for construction and financing. The government supports with permits, land release and review the project.

4.2. ANALYSIS OF PROCESS ORIENTED DIMENSIONS

4.2.1. Problem Identification

Obviously, better, and wider consideration of social and environmental issues should have a positive impact on project *acceptance* by the public, bringing the guarantee that most negative impacts of the project have been either avoided, mitigated or compensated.

This should in turn facilitate *bankability*, by limiting risks at project implementation level. There are some negative sides, however, especially for developing countries:

- project preparation costs increase and need to be covered by the owner of the project (developing countries may experience difficulties in finding adequate grants to finance preliminary studies).
- developing a portfolio of well-prepared projects is made more difficult; this is obvious today at a time when many countries have adopted recovery plans, but a pipeline of “shovel-ready” projects is often absent (except maybe for rehabilitation or maintenance projects).

It is not clear either whether road authorities at local level have adapted their *governance* to this new paradigm (e.g. France, example of Beynac bypass).

4.2.2. Considering Breath of Outcome

The broader the consideration of need and the potential outcomes, the better the level of understanding of the existing situation. Ultimately this broader appreciation of the issues, which in turn can be considered in the potential solutions, will result in greater levels of *acceptance*.

Projects that have a clear broad range of outcomes and objectives, with associated buy in from a range of stakeholders, will have a stronger case for investment. This will serve to increase the likelihood of funding and *bankability* and may also provide routes to additional non transport funding sources.

The early consideration of a broader range of outcomes, and clear articulation and agreement with stakeholders, provide a robust set of principles to use in *governance* of the project throughout the later stages.

4.2.3. Comparing and Appraising Options

A robust and holistic processes for comparing and appraising options increase *acceptance* by reflecting the broad range of potential options within the scheme development process. These options are likely to reflect those that stakeholders maybe promoting, and therefore the appraisal process can objectively report the advantages and disadvantages of different options. Clearly showing the better performing options.

An effective options appraisal process provides confidence in terms of investment (*bankability*) that the preferred solution is the best performing option and will therefore deliver the desired outcomes. This in turn increases transparency of the process, and a standard process allows independent *governance* and review of the options considered.

4.2.4. Programme Management

Program management is very important when it comes to impact on the three main criteria listed in our terms of reference, bankability, acceptance, and governance (transparency and accountability).

With a clear process for how the project will be implemented, which project goals are to be achieved, the total cost for the project and with a clear picture of how long it will take for the various stages, the conditions needed to finance the project and to create *acceptance* for the impact that different stakeholders will be affected by are created.

Being active in your programme management means being proactive, creating conditions for looking ahead and acting preventively. The master plans together create the conditions for quality assurance and thereby control the project. In this way, project implementation is secured for being carried out at the right time, at the right cost and at the right content, improving *bankability*.

Programme management structure is probably one of the most important factors in evaluating completed projects. Major changes to the schedule or content during implementation can have a major impact on the financing and cost, but also on how the issue of liability is handled. With a transparent process and clear *governance*, an understanding of changes that occur during the project is created and thus the opportunity to develop working methods becomes easier to implement.

4.3. COMMON ISSUES ENCOUNTERED - OVERALL

Acceptance

High income countries, with well-developed road infrastructure networks, are facing important issues regarding acceptance by civil society. Stakeholders and public consultations are time consuming and can drive changes in scope of work and budgetary challenges. Environmental constraints are also becoming an increasingly major issue in new road transport schemes. There is also a visible opposition against new roads projects, as one of the main contributors to emissions and climate change.

Bankability

Upper middle income countries, with less developed networks, have also major demand for new road transport routes, but are facing bankability issues mainly due to:

- Poor preparation of financing application.
- Lack of proper risk assessment.
- Financial / economic analysis not supported by traffic forecast.

Governance

All governments are seeking to improve transparency and accountability. There is still an issue with the political interference in upper middle income countries, and it is well known that large scale roads infrastructure projects can be linked with corruption during implementation stages.

5. LIMITS OF THIS STUDY

This literature review has been undertaken based on the readily available information, and several limitations have been identified at this stage.

- No countries from Low-income and limited countries from Lower middle income and low income
- COVID-19 – limited access to developing banks
- Via PIARC, access to national road system (basically at the ministry level) at the exclusion of regional and local contributions to the preparation of projects.

6. EMERGING CONCLUSIONS AND NEXT STEPS

The literature review highlighted similar practices across the countries considered within the study, suggesting these aspects form a key role in project preparation. However, in addition the literature review also has highlighted some aspects where the approach and governance vary across different countries. This may be due to political, social or culture reasons, but equally may represent a different in approach and therefore the robustness of project preparations. Initial comments against the different aspects considered are provided below.

- Environmental assessment – key aspect considered by all countries.
- Sustainable development – emerging aspect with varying levels of consideration.
- Social Value assessment – emerging aspect with varying approaches.
- Stakeholder and public engagement – key aspect, although with varying approaches.
- Technical standards and approvals – established element with well-defined processes.
- Economic assessment – established element with strong governance.
- Traffic modelling – established processes and systems to control.
- Cost, Budget, and Risk Management – critical element with varying levels of process and governance, especially in terms or risk management.
- Procurement and funding routes – vary across different countries.
- Construction strategy – key aspect which is heavily linked to the procurement and funding routes and therefore varies across different countries.
- Problem Identification – key element where there is a need to become more transparent and broader in consideration the nature of the problem.
- Considering Breadth of Outcomes – key aspects considered in all countries.
- Comparing and Appraising Options – key aspects considered in all countries.

Further work is planned by the task force to engage with lower middle income and low-income countries to understand their approach. The task force is also planning to identify relevant case studies which can be used to validate the importance of different aspects in terms of well-prepared projects. These two activities will allow the task force to collate the findings into a proposed set of characteristics that represent a well-prepared project and are relevant to all countries.

APPENDICE A - TERMS OF REFERENCE

TASK FORCE 1.1 – WELL PREPARED PROJECTS

How to improve bankability, acceptance, accountability, and transparency

Objectives

1. Review literature and existing project preparation softwares (e.g. SOURCE, HDM-4, EIPP, GIH) and analyze good practices of project management for improving and optimizing public and private investment.
 2. Identify how well-prepared projects contribute to a culture of transparency and accountability.
 3. Establish recommendations on:
 - Definition of strategies to set outcomes, optimize project delivery and project lifecycle
 - Requirements for road project preparation
 - Management relationship with financiers, with a view to maximizing project economic and possible budgetary return
 - Communication and engagement with stakeholders
 4. Encourage coordination with other TCs and TFs, such as T.C.1.1 – Performance of Transport Administrations, T.C. 1.2 - Planning Road Infrastructure and Transport to Economic and Social Development, and T.C. 1.3 - Finance and Procurement.
-

It is widely recognized that good preparation of infrastructure projects, first and foremost road projects, is of utmost importance to secure their proper financing, wide acceptance and seamless implementation.

It is nowadays all too common to hear financiers claim that plenty of money is available for project financing, but that what is lacking is good projects.

Whatever the type of country considered (industrialized, emerging, or developing), a good preparation of road projects is of outstanding importance for the following reasons:

For ordinary projects (e.g. procured on a traditional Design-Bid-Build procedure), there is a need for:

- Improved acceptability by all stakeholders (e.g. by populations directly affected by social and environmental aspects of the project, or by other donors or public authorities participating in the cofinancing, ...);
- Improved quality and resilience of the projects, in order to meet Sustainable Development Goals;
- Reduced risk of delays and cost overruns in construction and its possible impacts on maintenance
- Improved transparency in the procurement process and ethical behaviour of all parties.

For complex projects (typically PPP or concession projects), in addition to the above-mentioned reasons, it is necessary to:

- Explain to stakeholders the need to recourse to these complex procedures;

- Minimize transaction costs and standardize contract documentation as much as possible;
- Attract financing at favourable terms and conditions and sustainable funding;
- Overcome project complexity, while accepting innovative solutions.

To sum up, the better a project is prepared, the smaller the risks of seeing the project rejected by various stakeholders, or unable to reach adequate financing, or fraught during implementation with poor quality, delays, cost overruns, maintenance uncertainties and possible unethical behaviours associated with ensuing change orders.

The T.F. will aim at representing a wide diversity of circumstances, including cases from several countries and continents.

The final report will be based on a collection of case studies and will outline the various aspects analyzed, will make practical recommendations for road administrations and authorities and will focus on policy issues in both the short- and medium to long term.

The T.F. will make references to relevant activities and publications of other organizations, especially in the bank, contracting and consulting sectors, and academic publications. It will not duplicate their work.

Literature Review: November 2020

Collection of case studies: April 2021

Full report: September 2021

ANNEX - The SOURCE Software

The Source Software has been promoted initially by Multilateral Development Banks (MDBs), aiming however not only at developing or emerging countries.

It is now being developed by SIF (Sustainable Infrastructure Foundation), a Geneva-based foundation that has joined forces with other portals (e.g. European Investment Project Portal) to foster investment in infrastructure projects.

The SOURCE Software

The guidance provided by the SOURCE software is an interactive one: a logical set of questions are prepared for the project manager to answer. For most questions there is a list of the most frequent answers, and the manager simply has to select the box corresponding to his project.

The questions are organised by stages, according to the project development. Stages 1 to 4 correspond to the development phases; stages 5 and 6 to the tender process, Stage 7 to the work period and stage 8 to the operation period. After stage 1, the main characteristics of the project are described, and the government may ask MDBs or other IFIs for funding for the development of stages 2 to 4.

The questions are also organised by themes (Governance, technical, economic, legal; financial; environmental and social). The most important documents (for instance the feasibility study, the main technical characteristics of the project) have to be uploaded on SOURCE platform. In addition, before the start of the tender process, there is a possibility for the various stakeholders of the project (government bodies, advisors, contractors, financial institutions,..) to exchange information in a perfectly confidential way under project manager supervision.

To help the project manager to answer the questions, there are tooltips linked to all important questions. These tooltips are providing direct explanations and references to documents prepared by MDBs and IFIs about the topics referred to in the questions.

When reaching stage 4, the SOURCE software performs a series of automatic checks to test the consistency of the answers. If the consistency check is satisfactory, the project manager is informed and can call a reputable engineering office to check the answers and the tender documentation.

This process is practical and draws the project manager's attention to the main topics of his project.

A data base of the already completed projects will be used as a benchmark for future projects.

APPENDICE B - QUESTIONNAIRE

TF1.1 Well Prepared Projects – Initial Checklist/Questionnaire

Context

It is widely recognized that good preparation of infrastructure projects, first and foremost road projects, is of utmost importance to secure their proper financing, wide acceptance and seamless implementation. Whatever the type of country considered (industrialized, emerging, or developing), a good preparation of road projects is of outstanding importance.

Aim of this Document

To inform the work of the Taskforce an initial evidence collation/literature review is planned to understand the approach and processes adopted by different countries, clients or institutions. The questions and prompts below aim to serve as a common basis for reviewing approaches. Notes and/or links to relevant documents that explain the processes adopted should be added to the template.

Countries, Clients or Institutions	<i>Name....</i>
Taskforce Member Collating	<i>Name....</i>
Date	<i>Date....</i>
Is there a framework/structure we outlined the process and key stages for project development?	
<i>Notes....</i>	
What processes and procedures are in place for;	
Problem Identification	<i>Notes....</i>
Considering Breadth of Outcomes	<i>Notes....</i>
Comparing and Appraising Options	<i>Notes....</i>
Traffic Modelling Robustness	<i>Notes....</i>
Sustainable Development (e.g carbon)	<i>Notes....</i>
Environmental Assessment	<i>Notes....</i>
Stakeholder and Public Engagement	<i>Notes....</i>
Technical Standards and Approval	<i>Notes....</i>
Economic Assessment and modelling	<i>Notes....</i>
Social Value Assessment	<i>Notes....</i>
Cost, Budget and Risk management	<i>Notes....</i>
Programme Management	<i>Notes....</i>
Procurement and Funding Routes	<i>Notes....</i>
Construction Strategy	<i>Notes....</i>

What is the process for identifying project outcomes, do they include input from a wide range of stakeholders?
<i>Notes....</i>
Do the options considered typically consider a wide range of options, including reuse of existing and other forms of transport?
<i>Notes....</i>
What are the formal requirements to obtain consent/acquire land to build a scheme.
<i>Notes....</i>
Are the processes followed and enforced?
<i>Notes....</i>
What are common issues occurred on projects that have major impact on schemes?
<i>Notes....</i>

APPENDICE C - PROJECT LIFE CYCLE COMPARISON

Chile (Conservation Project)	Data Collection	Technical Viability	Economic Viability	Project Design			Project Development		
Mexico	Planning	Evaluation		Programming and Budgeting	Formulation and Structuring		Bidding Process	Evaluation and Assignment	Financial Closure
China	Planning	Pre-feasibility study		Feasibility Study (including Environmental Impact Assessment, Public Participation and land use)	Project Authorization				
UK	Stage 0 - Pre-Project <i>(Scrutiny and</i>	Stage 1 - <i>Options</i>	Stage 2 - <i>Options</i>	Stage 3 - Preliminary <i>Decision</i>	Stage 4 - Statutory Procedures		Stage 5 - Construction Preparation		
Quebec	Study of Needs	Study of Solutions		Preliminary Concept	Preparation of plans and specifications and release of rights-of-way		Construction - Before Works		
Sweden	Longterm planning of the transport system	Planning		Design Phase 1 (inc pre design studies, planning process)			Design Phase 2 (inc Design and tender documents)		
Spain		Planning Level		Preliminary Design (inc Environmental Assessment, Public Consultation, Road Safety Audit)			Layout and Detail Project (inc land acquisition, public consultation, Road Safety Audit)		
Poland	Strategic environmental impact assessment of National Roads Construction Programme	Corridor Study (inc analysis of at least 3 routes and public consultation)		Environmental Impact Assessment	Concept Design		Procurement for Design and Construction of for Construction design and technical design	Construction Design and Technical Design	
Romania		Conceptual note and brief design requirements	pre-feasibility studies	design for building permit			detail design (technical project for execution)		
France	Infrastructure Planning	Opportunities Studies / Public Debate		Preliminary Studies (Prior to Public Utility Inquiry)	Public Utility Study	Public Utility Inquiry / Authorization	Project Studies		
	Overall transport network planning and scheme identification	Feasibility Study		Preliminary design for impact and assessments and consents and Consents/Planning/Permit Process			Detailed Design/Design for Construction/Works Planning		

Construction?		
Work Execution	Operation and	Exposition and Evalu
Construction?		
Stage 6 - Construction	Stage 7 - Closeout	
Construction - Works	Evaluation	
Construction Phase	Closing Phase	
Construction?		
Construction		
Construction?		
Works / Infrastructure Operation		
Construction/Works	Operations/Maintenance and Closeout	

APPENDICE D SYNOPTIC VIEW OF ANSWERS TO THE QUESTIONNAIRE BY COUNTRIES

Country category	High-Income Country
Country	Canada - Québec
Problem Identification	<i>Opportunity Study based on inventory, condition appraisal (Network Testing and Inspection Phase).</i> <i>Then strategic planning carried out considering other parameters, e.g. user safety, asset maintenance, improved mobility (current vs anticipated use of the network, congestion points, real estate developments), needs of various stakeholders.</i>
Considering Breadth of Outcomes	<i>Cultural, social and economic factors influence the preparation and implementation of projects.</i> <i>The whole process of project preparation is detailed in a comprehensive "Road Project Preparation Guide".</i>
Comparing and Appraising Options	<i>At design stage (both in preliminary and final project), various scenarios and alternatives are considered.</i>
Traffic Modelling Robustness	<i>Regional models of urban transportation of people support the planning exercises of Quebec's urban transportation systems (Quebec, Montreal, Gatineau, Sherbrooke, Trois-Rivières and Saguenay). It guides the prospective analysis of transport demand, the design of regional transport plans and the completion of opportunity (need study and solution study) and impact studies for transport infrastructure projects. The department's urban transportation modelling differs slightly from the "traditional traditional four-step or conventional sequential approach." Instead, the Department opts for a modelling method that relies on the quality and scope of origin-destination (O-D) surveys conducted in urban areas. General concepts of urban transport models of people: General concepts of urban transport models of people, Ministry of Transport of Sustainable Mobility and Transport Electrification, November 2017 (https://www.transports.gouv.qc.ca/fr/ministere/Planification-transports/modeles-transport/Pages/modeles-transport-urbain-personnes.aspx) .</i> <i>By the law for sustainable development: « la loi sur le développement durable » of government du Québec all ministry an organism have the obligation to elaborate an action plan for sustainable development that will contribute to reach the government objectives fix by the government strategy for sustainable development 2015-2020: "Stratégie gouvernementale de développement durable 2015-2020".</i>
Sustainable Development (e.g. carbon)	<i>Included in the mission of the Quebec Ministry of Transport, sustainable development and therefore sustainable mobility are very important to the Department. Respects the integrity of the environment by limiting polluting</i>

emissions, waste and the consumption of space, energy and other resources, as well as by reusing and recycling its components and minimizing sources of noise pollution are included.

In this sense, the ministry has included several measures aimed at sustainable development. These measures are reflected in the analyses made during the design of works of art and roads, as well as in the standards and guides produced by the MTQ. One example is the inclusion in design guides and standards for more than 15 years of various methods that allow the use of recycled material in transportation infrastructure.

"Carried out at various stages, from Opportunity Study to Constuction phase. The MTQ validates, internally, environmental considerations for all projects at all phases of the project.

Environmental Assessment

During the design phase, projects that meet certain criteria are subject to an environmental assessment specifically to an environmental impact assessment. There are three types of environmental assessment that can be submitted to a road project: southern environmental assessment (Quebec), northern environmental assessment (Quebec) and federal environmental assessment (Canada). All environmental studies are governed by provincial and federal laws that govern their processes. Provincial and federal assessments are independent.

Each of the environmental assessment procedures contains a phase of public participation through consultation periods and public hearings on the environment.

At the end of the evaluation process, the project is authorized by an environmental decree issued. This decree stipulates the elements to be included in the project during the design and construction phases of the road infrastructure but also the assessments that will be required following the implementation during the operation of the road network."

Stakeholder and Public Engagement

Carried out at various stages, from Opportunity Study to Construction phase . A stakeholder management methodology on the PMBOK has been put forward to meet the requirements of major projects. It is currently in the process of approval.

Technical Standards and Approval

Technical guides and standards available for all technical domains (road design, road construction, artwork, roadsides, road signs, traffic control devices, maintenance, materials and restraints.

"Part of the design process (preliminary as well as final design). For projects lower than \$5 million, during the opportunity study, a life cycle cost analysis is required.

Economic Assessment and Modelling

For projects over \$5 million, during the opportunity study phase and in the preliminary design phase an economic analysis is required. It is based mainly on benefit-cost analysis and multi-criteria analysis. The financial arrangement of a project consists of the costs of the preparation activities, the construction, a provision for risks, contingency and inflation. As part of the \$100 million or more projects related to the Major Public Infrastructure Projects Management

	<i>Directive, project overhead and financing costs are added to the funding package."</i>
Social Value Assessment	<i>Part of the design process (preliminary as well as final design).</i>
Cost, Budget and Risk Management	<i>Special directive for management of Major Infrastructure Projects (>\$100M). Specific focus on risk management (Risk Management Guidebook): a risk management methodology has been developed to better estimate needed budgets.</i>
Programme Management	<i>Programme management is described in great detail (see "Ministerial Development of Road Projects Implementation"), with deliverables defined for every checkpoint, as well as who is responsible for what, depending on the size of the project. The Department of Transportation is implementing a program management guidelines to identify the elements to be considered in various upcoming programs such as project programs related to regionalized integrated management of road assets and the resilience of road infrastructure to climate change.</i>
Procurement and Funding Routes	<i>Primarily, the Quebec government contributes to the financing of the road network through the Quebec Infrastructure Plan (PQI) sector Road Network. In addition to this plan, the government is carrying out projects with input from partners such as the federal government (Government of Canada) and various municipalities. The cost of financing infrastructure investments owned by the Quebec government is depreciated in its expenditures over their useful life, usually over a period ranging from 3 to 50 years depending on the nature of the asset. In addition, interest expense, related to loans for infrastructure acquisition, will be spread over the repayment period of these loans, which usually range from 5 to 30 years.</i>
Construction Strategy	<i>The Department of Transportation construction strategies are:</i> <i>• Traditional mode: Consists of producing the draft and plans and specifications and then making a call for tender for the construction of the works by a general contractor.</i> <i>• Design-Build Mode (CC): involves a single contract for a company or consortium that includes the design and construction of transportation infrastructure. It assumes the risks associated with the costs and timelines of the project. This mode is generally used in large-scale projects (\$100 million or more).</i> <i>• Public-private partnership mode (P.P.P.): Consists of a group or company that is selected in a call for tender, is entrusted with the contract for which it finances the construction from the operating income, before transferring ownership to the owner (Build, Own, Operate, Transfer or BOOT).</i> <i>• Accelerated bridge construction (ABC) mode: Accelerated bridge construction uses innovative planning, desing, materials and construction method strategies. This method is used to reduce on-site construction time for the construction of a new bridge and to replace or rehabilitate an existing bridge. This mode is almost exclusively used in structural projects where the MTQ must minimize the duration of the intervention in order to minimize the</i>

impact on mobility because this construction method is generally more expensive than the traditional mode.

Common issues encountered *The common issues that occurred in the projet are link with 5 factors (real estate activities, relocation of public utility, environmental assessment, problem with the quality of the work*

Country category	High-Income Country
Country	Chile
Problem Identification	<i>Answer only for maintenance projects.</i> <i>Based on data collection , technical and economic viability, project design and development.</i>
Considering Breadth of Outcomes	<i>Identification of project outcomes is based on meetings with stakeholders (Community, municipality, public transport) and road inventory instructions.</i>
Comparing and Appraising Options	<i>At step 2: technical viability</i> <i>Occasionally traffic separation is considered to share space with cyclists and pedestrians.</i>
Traffic Modelling	<i>None</i>
Robustness	
Sustainable Development (e.g. carbon)	<i>None</i>
Environmental Assessment	<i>Not applicable to maintenance projects.</i>
Stakeholder and Public Engagement	<i>At step 1: Data collection</i> <i>Land acquisition is not an issue for maintenance projects.</i>
Technical Standards and Approval	<i>Chilean Road Manual</i> <i>AASHTO (road design)</i> <i>European norms (safety standards)</i>
Economic Assessment and Modelling	<i>At step 3: economic viability</i>
Social Value Assessment	<i>Not applicable to maintenance projects.</i> <i>For construction projects, social profitability studied with Ministry of Social Development</i>
Cost, Budget and Risk Management	<i>At step 2: technical viability</i>
Programme Management	<i>At step 5: project development</i> <i>Processes are followed and enforced through random quality control, monitoring risk prevention, visits by specialists, internal audits...</i>
Procurement and Funding Routes	<i>Law 1093/2003</i> <i>Annual budget law</i>
Construction Strategy	<i>None (depends on the construction company)</i>
Common issues encountered	<i>Changes on terrain condition</i> <i>Existing ground conditions - services utilities</i> <i>Political decisions</i>

Country category Country	High-Income Country France
Problem Identification	The “Mobility Orientation Law” passed on 24 December 2019 has provided a general framework for transport planning and organization, regardless of modes. It applies to all transport authorities (notably for public transport). The main problems identified are: - “Transport of every day” (the law was partly a response to the “yellow vest” protests in France); - Ecological transition - New transport modes, etc.
Considering Breadth of Outcomes	The contents of this recent law are however of very general nature, and do not provide any kind of project planning whatsoever, let alone programming. Additional regulations may provide more details in the future. Identification of individual road projects, based mainly on traffic and safety data, and follow-up of relevant procedures are still made by the owner in charge, be it the Ministry (National network), Department or Municipality. The outcomes are assessed against socio-economic and environmental considerations. Major trends are: (i) taking into account a multimodal approach; and (ii) wider scope on environmental and human health issues (incl. noise, natural areas, water and wet areas, air, biodiversity, flora, fauna, etc;) Various options are analysed, both at macroscopic level (SEA) and during opportunity studies (selection of transport mode, layout alternatives) as well as further preliminary or project studies.
Comparing and Appraising Options	These analyses are carried out in consultation with relevant stakeholders (see below Stakeholder and Public engagement) and fine-tuned progressively. Decisions and approvals are formalized after each project stage, shared between the local and central level and described in detail in TD. Traffic studies are the basis for comparing various options; they are also used for some environmental assessments (air, noise...).
Traffic Modelling Robustness	MG recommends that models used are explicitly described (type of model, data, study area, traffic growth assumptions, margin of uncertainty...), so that their validity can be assessed. “Traffic models” are used for road projects, while “trip models” are used for intermodal comparisons.
Sustainable Development (e.g. carbon)	Sustainable development is clearly part of the rationale behind the “Mobility Orientation Law”. Project preparation therefore requires consideration of economic, social and environmental issues, with an increasingly wide and deep scope.
Environmental Assessment	Environmental studies are stretched all over the whole project preparation process, with increasing width of scope (focus on more salient issues) and details. They are iterative, progressive, and should be <u>commensurate</u> with the environmental issues at stake. The utmost principle is to “<u>Prevent, Reduce or Offset</u>” possible harmful effects of the project on the environment. Procedures meet the norms set up at European level: Aarhus Convention; Directive 2001/42/EC — Strategic Environmental Assessment Directive (SEA; macro level); Directive 2014/52/UE; (Environmental Impact Assessments (EIA) for individual projects. The Code of Environment provides a detailed breakdown of types of infrastructure works. For instance, an EIA is mandatory for construction or

Stakeholder and Public Engagement	widening of motorways, including interchanges, and for bridges with a span over 100 meters. (see attached flowchart for more details) There are different stakeholders: - State agencies (e.g. other ministries, Environment Authority); - Other public authorities (departments, municipalities, especially in case of cofinancing); - Civil society (public at large, associations, etc...) Their consultation is mandatory at different stages, e.g.: - Environment Authority (at SEA level, before Public Utility Inquiry) - Public: possible public debate after opportunity study; Public Utility Inquiry. Consulting the public is a continuous process during the preparation of the project. Large projects are subject to a public debate. This procedure is mandatory for projects cost above 300 M€ or length above 40 km. The "General Council for the Environment and Sustainable Development" (CGEDD) plays an important role as the main Environment Authority. They are involved: - for projects approved by the Ministry in charge of Ecology; - for projects approved by another Ministry; - if the Ministry in charge of Ecology wishes to bring the project at national level.
Technical Standards and Approval	There are three main categories of technical rules: - Regulations, in the following hierarchical order: European Directive, Law, Decree, Ministerial order, Mandatory standards (by law or decree), Local authority order; they are strictly mandatory; - Professional standards: to be applied as strictly as possible; e.g. technical order by the Director of Transport Infrastructure; - State of the art: to be applied as good practice.
Economic Assessment and Modelling	An important role is played by CEREMA (Centre for Studies and Expertise on Risks, Environment, Mobility and Urban Planning). Although CEREMA is a State agency, it is often engaged by other public transport authorities. Whereas traditional Cost-Benefit Analyses are widely used (typically focusing on gains in travel times and safety), they are complemented with multicriteria analyses and socio-economic assessments. The latter are mandatory, possibly including monetization of all costs and benefits, so that not only negative effects of the infrastructure should be analyzed, but also positive effects for the public at large.
Social Value Assessment	This is part of the general socio-economic assessment.
Cost, Budget and Risk Management	Estimates and costs are followed at the different project stages based on templates available in relevant softwares (e.g. for opportunity studies, preliminary studies, project studies, works). Budget is monitored and reported on a yearly basis. Risks should be assessed according to their nature (e.g. geological risks, risks pertaining to new regulatory constraints, or to changes in the project...). A specific risk analysis is required e.g. for tunnels.
Programme Management	The main characteristics are: - accurate definition of responsibilities between staff in charge at central and local level - a distinction made between "infrastructure players" (i.e. traditional engineers and specialized consultants) and "environment players" (i.e. those

Procurement and Funding Routes	<i>staff in charge of e.g. impact assessments, in close coordination with the previous ones, and possibly assisted by relevant experts).</i> <i>(see attached flowchart for more details)</i> <i>For State projects (national networks), different procurement and funding routes are possible:</i> - <i>traditional funding by State budget, studies carried out at ministry level, procurement on a Design-Bid-Build basis;</i> - <i>funding by cofinancing with local authorities (Regions, Departments, Municipalities,...); Design-Bid-Build;</i> - <i>Public-Private Partnerships, under either (i) a toll concession, usually for large projects; a State subsidy may be involved if the project cannot reach financial balance; or (ii) a partnership contract, whereby a private contractor is in charge of design, construction and maintenance for a period of time, and reimbursed based on yearly installments.</i> <i>Concessions are mainly financed by road users, whereas partnership contracts are financed by taxpayers.</i> <i>For Department or Municipality projects, traditional funding is the only route.</i>
Construction Strategy	<i>Detailed construction strategy usually determined mainly by the private contracting partner. But public partner has a key role to play in:</i> - <i>planning and managing utilities displacement;</i> - <i>caring for adequate land space to carry out the works, even on a temporary basis (e.g. temporary bypass, access to difficult sections, etc.)</i>
Common issues encountered	<i>Issues that have a major impact are:</i> - <i>environmental issues, either as an objective in itself or as the preferred route to have a project cancelled ("Nimby" attitude);</i> - <i>defiant attitude towards road transport (and road projects) as one of the main contributors to CO2 emissions.</i>

Country category	High-Income Country
Country	Poland
Problem Identification	<i>General Traffic Measurements (GPR) are the basic source of traffic information in Poland. This data is crucial for the road administration to implement tasks related to road network management, maintenance and development planning, as well as for environmental and economic analyses. It is used to make decisions about the improvements options (construction of new roads or reconstruction of existing sections or development of traffic organization projects).</i> <i>On that basis economic indicators determining the implementation of the investment are established. Data obtained from the GPR are used for making decisions related to road classification, determining routes and their priorities in the road network, both at national and international level. On that basis the Strategy for Sustainable Transport Development is developed as well as the National Road Construction Program (PBDK).</i>
Considering Breadth of Outcomes	<i>The following aspects are considered:</i> - Environment (including society, stakeholders) - Economy - Technical aspects
Comparing and Appraising Options	<i>Multicriteria analysis at different project stages</i>
Traffic Modelling Robustness	<i>Considered at different stages of the project development</i>
Sustainable Development (e.g. carbon)	<i>Sustainable development considered within:</i> - Multicriteria analysis - Environmental Impact assessment <i>For road investments, it is compulsory to obtain environmental agreement (EA).</i> <i>There are two paths to follow:</i> - for less complicated projects, EA is based on Project Information Card - for the majority of cases, Environmental Impact Assessment is required - In some cases, the Environmental Impact Re-assessment is required while Decision on the Performance of the Road Investment is conducted - in some cases, Post Implementation Analysis is required <i>For Internal Procedures (IP) and Law Regulations (LR), a broad public engagement at all investment stages is required:</i>
Environmental Assessment	
Stakeholder and Public Engagement	- prior to the selection of route option (IP) - while EA proceeds (LR) - prior to selection of construction option (IP) - while proceeding with Decision on the Performance of the Road Investment Project (LR) <i>The project has to meet:</i> - general technical regulations (obligatory for all road object, facilities) - internal technical standards (for GDDKiA investments).
Technical Standards and Approval	<i>Process of approval after all stages of the project development:</i> - investment project evaluation team (ZOPI) at division level - investment project evaluation committee - at the central level (headquarters and ministry representatives) - legal path (after internal approval)

Economic Assessment and Modelling	<i>As a part of the multicriteria analysis at different project stages (corridor study, technical – economic – environmental study, concept design).</i> <i>Selection based on the score order.</i>
Social Value Assessment	<i>As a part of the multicriteria analysis at different project stages (corridor study, technical – economic – environmental study, concept design).</i> <i>Selection based on the score order.</i>
Cost, Budget and Risk Management	<i>As a part of the multicriteria analysis at different project stages (corridor study, technical – economic – environmental study, concept design).</i> <i>Selection based on the score order.</i> <i>Risk management: to check</i>
Programme Management	<i>First programme appears at the very beginning of the project. Prior to the Ministry approval of Investment Programme. Then in due course of the whole investment process, the programme is updated and extended if necessary.</i> <i>There are time guidelines for particular processes depending on the complexity of the project.</i> <i>Procurement - up to value.</i> <i>Basic options are open and restricted procedure. Other options are restricted, allowed only upon exceptional circumstances.</i>
Procurement and Funding Routes	<i>Funding routes:</i> <i>- national sources</i> <i>- UE and others (EIB)</i> <i>- PPP</i> <i>- D&B formula - the boundary conditions are indicated in the terms of contract.</i>
Construction Strategy	<i>- traditional formula (first design and then construction) - construction strategy indicated by Client in the Terms of Reference. Contractor has limited options for amendments.</i> <i>Stakeholders objections</i> <i>NGO's engagement</i> <i>Geological conditions</i>
Common issues encountered	<i>Geological companies as subcontractors of design companies</i> <i>Contractor Financial problems</i> <i>Arrangements with utilities owners – in case of collision with infrastructure (most of all railway and Polish Waters)</i> <i>Objections issued by contractors at tender stage</i>

Country category	High-Income Country
Country	Romania
Problem	<i>All large scale transport infrastructure projects (roads, railways, airports and waterways) are covered by General Transport Masterplan - planning document at national level.</i>
Identification	<i>At county / regional level there is a demand coming from local authorities, sustained by traffic data, mobility, accesibility, safety issues. Local / regional projects are brought and prioritized in the Regional Development Plans. Roads projects outcomes are defined from preliminary stages and are related strictly to traffic and connected elements such:</i>
Considering Breadth of Outcomes	- <i>reduce of polution</i> - <i>reduce of fuel consumption</i> - <i>reduce of travel time, passengers and goods</i> - <i>increase of safety</i>
Comparing and Appraising Options	<i>In the prefeasibilty study - selection of alternatives, a multicriteria analyse is used to differentiate the alterantives, based on technical criteria, economical criteria and environment impact criteria</i> <i>The Feasibility Stage involves a CBA, based on VOC calculation for a 30 years lyfe cycle. Methodolgy for MCA and CBA is developed by Financing bodies / Jaspers</i>
Traffic Modelling Robustness	<i>None</i>
Sustainable Development (e.g. carbon)	<i>Environment impact assesment (EIM) is a key instrument at EU environmeny policy.</i> <i>This is covered by Directive 2011/92/EU modified by Directive 2014/52/EU regarding the evaluation of certain public and private projects impact on the environment (EIM Directive).</i> <i>European legislation has been imposed in national legislation by law 292/2018 (colled EIM Law).</i> <i>Although there is a legislation in place, there are no procedures at project levels to impose / rankup technical solutions with direct impact in sustainable development such reuse / recicyng of existing materials.</i> <i>Environment impact assesment (EIM) is a key instrument at EU environmeny policy.</i>
Environmental Assessment	<i>This is covered by Directive 2011/92/EU modified by Directive 2014/52/EU regarding the evaluation of certain public and private projects impact on the environment (EIM Directive).</i> <i>European legislation has been imposed in national legislation by law 292/2018 (colled EIM Law).</i>
Stakeholder and Public Engagement	<i>Stakeholders and public consultation has to 2 stages:</i> - <i>at the planning level, during preparation of the national masterplan or regional deve3lopment plans</i> - <i>at the project preparation level under the EIA procedure.</i> <i>All projects must meet the following regulations:</i>
Technical Standards and Approval	- <i>European Norms and other national standards</i> - <i>General Technical Specifications</i> <i>issued by National Company for Roads Infrastructure Administration</i> - <i>Design Norms issued by National Company for Roads Infrastructure Administration</i>

Economic Assessment and Modelling	<i>Financing bodies guidelines / Jaspers for Coste Benefit analyze.</i>
Social Value Assessment	<i>Procedure based on 30 years span traffic forecast and Vehicle Operation Cost assesment against investment / maintenance cost.</i>
	<i>Financing bodies guidelines / Jaspers</i>
	<i>Part of multicriteria analyse at pre-feasibility study</i>
	<i>Cost and budget has 2 assesment stages:</i>
	<i>- at the pre-feasibility level, when similar works costs are used just for purpose of a preliminary comparison of various alternatives</i>
	<i>- at the fesibility study, when a detailed estimation of works quantities and unit prices are used. Cost estimate at the feasibility study is the ground for budget approval at the financing authority level.</i>
Cost, Budget and Risk Management	<i>Most of large scale infrastructure projects are contracted as design and build, therefore Contractor is required to perform a risk assesment and propose a risk management plan. Contractors are required to assume all risks foreseen and unforeseen, thus leading to high execution cost and often, projects delays.</i>
	<i>A time planning is produced in early stage of the project by the consultant preparing the pre-feasibility / feasibility study.</i>
Programme Management	<i>Programme includes all implementation stages - field investigations - permits and approvals - land acquisition - public consultation - project preparation - execution.</i>
	<i>Programme is adjusted by the contracting authority / beneficiary as necessary</i>
Procurement and Funding Routes	<i>Procurement law 98 / 2016</i>
	<i>European and National Funds</i>
	<i>World Bank and other development banks</i>
	<i>Construction strategies are analised at the prefeasibility study in a multicriteria analyse, under the technical criteria. This is going to be approved by the stakeholders and forwarded to the next stage for a cost benefit analyse, if is necessary. There is no involvement of contractors in the decision of the construction strategy at this stsge.</i>
Construction Strategy	<i>Contractors are fully responsible for the construction strategy after the award of the contract, but within the budgetary and right of way limits. At this stage, construction plan has to be approved by the beneficiary and the independent consultant acting as Engineer on site, prior the commencement of works</i>
	<i>Few of them:</i>
	<i>- Lack of cooperation between local authorities and central government</i>
Common issues encountered	<i>- Existing ground conditions - services utilities / environment protected areas / landslides</i>
	<i>- Tender documents, contracting procedure</i>
	<i>- Standard technical solutions - BIM</i>
	<i>- Politically driven decisions during various implementation stages</i>

Country category Country	High-Income Country Spain
Problem Identification	<i>Problem identification comes from two different origins:</i> - <i>The National Planning Programme, called PITVI (2012 – 2024; “Infrastructure, Transport and Housing plan”). It covers all the country and several means of transport;</i> - <i>Local requests from the regional offices of the Ministry. They may propose to start a specific project after they identified a problem in their road network.</i> <i>This proposal has to be approved by the Road General Director.</i> <i>The main problems to be solved are:</i> - <i>Need to increase traffic capacity;</i> - <i>Need to improve road safety (critical in Spain);</i> - <i>Need to improve the accessibility to a specific region, even in absence of a major traffic demand.</i>
Considering Breadth of Outcomes	<i>The breadth of the outcomes is quite standardized, depending on the detail of the design. It’s clearly described in the ministry procedures available on the web and in the terms of references of the bidding documents. If a specific project requires a non-standard scope of works, it’s defined by the Projects Road Subdirection.</i>
Comparing and Appraising Options	<i>At a first stage, a <u>preliminary study</u> has to be completed (Road Law) “... in which the different layout alternatives, the connection and the exploitation of the object of study are selected and compared and, in general terms, the effects that can serve as a basis for the public consultation and, if it is the case, for the environmental evaluation process, in order to select the most appropriate”. So, various aspects are taken into account in the comparison process: financial, cost effectiveness, environment, construction, exploitation, functionality, traffic requirements, etc.</i> <i>The Road Law states that a Public Consultation Process has to be fulfilled. The observations in this procedure can only be taken into account if they are about the circumstances that justify the declaration of general interest of the road and about the global conception of its layout.</i> <i>On the other hand, the Evaluation Environmental Law states that a Public Consultation Process has to be fulfilled in order to receive the feedback of external stakeholders (environmental associations, citizens, etc.).</i> <i>Both Public Consultation Processes can be performed at the same time. Once all the options have been defined and the public consultation is fulfilled, a multicriteria analysis is performed.</i>
Traffic Modelling Robustness	<i>Two different Traffic models are performed:</i> - <i>Along the preliminary study;</i> - <i>Along the Detailed Project Phase (called “Construction Project” in Spain).</i> <i>In both cases, three main references are taken into account:</i> 1. <i>HCM 2010;</i> 2. <i>“Service Note 5/2014. Prescriptions and technical recommendations for carrying out traffic studies of the Informative Studies, Preliminary Projects and Highway Projects”;</i> 3. <i>“Instruction about specific actions to improve efficiency in the execution of public works for railway, roads and airports infrastructures of the Ministry of Transport”: fixes the traffic growth rate to take into account in the traffic studies.</i> <i>Even though traffic studies are taken very seriously in road projects, the</i>

Sustainable Development (e.g. carbon)	deviations observed between the predicted traffic intensities and those actually measured have cast doubt on the robustness of these studies. Spain has endorsed the UE commitment 2030. At project level, some issues have to be taken into consideration carefully: - Mandatory: Construction and demolition waste management (UE Legislation 98/2008/CE and Spanish Law). Each project includes a specific report; - Mandatory: analysis of the possibility to re-use materials coming from the demolition of the road pavement; - Optional: analysis of the possibility to re-use materials coming from industrial waste in the pavement structure design. Performed through the Evaluation Environmental Law, based on EU legislation (Directive 2011/92/UE). There are different cases:
Environmental Assessment	- In most cases, an « Ordinary Environmental Assessment » is required, including an « Environmental Impact Assessment ». The process leads to an « Environmental Impact Declaration », which states the conditions to be considered along the project's design and construction. A Public Consultation Process is required; - For projects with a non-significant environmental impact, a « Simplified Environmental Assessment » is required. The process leads to an « Environmental Impact Report ». A Public Consultation Process is not required, but a report is required from the Public Administration competent for environmental issues (water, coasts, historical heritage, etc.). Two different paths: - Public consultations, as described above, due to legal requirements based on three different laws: (i) Environmental Law; (ii) Road Law; (iii) Expropriation Law;
Stakeholder and Public Engagement	- Along the design phase. All stakeholders possibly affected by the project are contacted: services companies (electrical, telecoms, power, etc.), farm owners of channels, companies that runs public services (buses), etc. In the design phase, the reports sent by other Public Offices or Administrations are analysed, and most of the cases are managed through additional contacts (meetings, emails, etc.) in order to fully understand what's their interest regarding the project according with what they report in the public consultation.
Technical Standards and Approval	Technical standards are public (https://www.mitma.gob.es/carreteras/normativa-tecnica). Contracts specify the technical standards to be applied. Most standards are Spanish, some of them come from the EU (Eurocode, Road Safety Standard -Directive 2008/96/CE-, some tunnels standards -Directive 2004/54/CE), construction products -UE 305/2011-) etc. The approval process requires that funds have been made available in the General Budget. The technical approval process of the detailed project is as follows: • The project is splitted into five phases, with increasing detail, requiring consecutive approval. • The regional office of the Ministry is responsable for the project, with the help of a private consultancy. • The project is supervised by the Central Headquartes of the Ministry in Madrid (Road Project Subdirection), with the help of a private consultancy. • Before the approval of Phases 3 and 5, a « Road Safety Audit » has to be passed.

	<i>Responsibilities for approval are shared between the following entities: Ministry; Road General Director; Road Project Subdirector; and local offices of the Road General Direction.</i>
Economic Assessment and Modelling	
Social Value Assessment	<i>Taken into consideration in the preliminary design and in the environmental evaluation. Some aspects are analysed: population profile, accessibility, local economy...</i>
Cost, Budget and Risk Management	<i>Two different approaches about the meaning of the "cost of the project":</i> - <i>Meaning the amount to be paid to the private civil engineering: about 2,5% of the estimated cost of the works to be designed in the project itself. This percentage will change after the procurement process, due to the competition among the different engineering firms at the tender stage.</i> - <i>Meaning the cost of the road to be designed: the regional office of the Ministry estimates the initial cost of the road. Afterwards, the cost will be defined in the preliminary and detailed design.</i> <i>No risk management is carried out along the process.</i>
Programme Management	<i>Both the preliminary design and the detailed design start with an estimated schedule of the project. Afterwards, the schedule is updated regularly. It's not easy to manage the programme, as most of the time the critic path depends on external stakeholders and law requirements fulfilment.</i>
Procurement and Funding Routes	<i>Procurement: based on the Public Sector Contract Law, that takes into consideration the EU Legislation (Directives 2014/23/UE and 2014/24/UE). There's a public bidding process. The bidders have to fulfil some requirements. Final decision based on technical and financial criteria.</i> <i>The funding provides:</i> - <i>Most of the time from the National Budget;</i> - <i>From the private sector through a PPP contract.</i> <i>Nowadays, about 10% of the national net is under a PPP scheme.</i>
Construction Strategy	<i>Most of the time, once the Layout Project is finished, there's a bidding process and a private construction company carries out the works, under the supervision of the regional office of the Ministry.</i> <i>In case of a PPP project, the regional office of the Ministry supervises too, but as the PPP company is the owner of the risk, the supervision is not so tough.</i> <i>Along the design phase:</i> - <i>Schedule deviation due to:</i> - o <i>Fulfillment of law requirements (public consultation processes, Road Safety Audits, etc.);</i> - o <i>Stakeholders objections management;</i> - o <i>Time invested in the supervision process.</i> - <i>Cost of the project due to deviation from the previous estimations.</i>
Common issues encountered	<i>Along the construction phase:</i> - <i>Financial deviation of the cost of the works from the previous estimations;</i> - <i>Geological Risks;</i> - <i>Changes in the construction strategy in order to adapt it to the constructor equipment. Most of the times, behind these changes there's a strategy orientated to increase the cost of the works;</i> - <i>Relocations of public services not completed at the beginning of the works. Most of the time, the relocations of public services has to be completed by the companies that operate those services.</i>

Country category	High-Income Country
Country	Sweden
Problem Identification	Road planning and building are made through a comprehensive planning process. The process starts with the identification of shortcomings in the current transportation system. We then investigate how these can be improved or reduced through a "Strategic choice of measures". The study describes the identified problems and shortcomings, and deal with which types of measures that are possible in order to solve a transportation problem. The choice of measure study is made according to the 'four step' principle in order to get the maximum benefit of the resources invested. This is the philosophy we make use of both in the choice of measures study and when we plan the solutions in more detail.
Considering Breadth of Outcomes	The results are then placed in a so called "Bank of measures". From there, they are picked out and put into the National infrastructure plan. Based on this plan, the measures are then selected for further detailed planning. (Longterm planning of the transportsystem, Collect and process road and railway data/information, Plan execution of transport plans, Plan actions on roads and railways) A road project must be planned according to a particular process governed by laws, and which finally leads to a road plan. The process is called the planning process and the work on producing a road or railway plan is called planning. The planning process studies where and how the road is to be constructed. How long it takes to get an answer depends on the size of the project, how many studies are required, whether there are alternate routes, what budget exists and what those affected think. The results of the planning process and the design of the road is described and reported in a road plan.
Comparing and Appraising Options	see above
Traffic Modelling Robustness	see above
Sustainable Development (e.g. carbon)	Sustainable development is part of the four step principle. Environmental assessment, and required parts of our Swedish environmental law (Miljöbalken), are integrated in our Planning process. For example, many of our projects are required by law to execute an environmental impact assessment which has to be approved by either the county administrative board or our government. Additional environmental actions that our projects are required to plan and execute are described in our environmental management process.
Environmental Assessment	see above
Stakeholder and Public Engagement	Stakeholder and public engagement/consultation are all part of the processes described above.
Technical Standards and Approval	Our technical Our technical standards are public and can be found here: https://puben.trafikverket.se/dpub/sok All of them are specific Swedish standards, and the EU directives, such as the Road Safety Standard (Directive 2008/96/CE), some of the tunnels standards

	<i>(Directive a 2004/54/CE) and construction material (UE 305/2011, are integrated in our technical standards and regulations.</i>
Economic	<i>We are not sure what the meaning of this question is?</i>
Assessment and Modelling	<i>The national infrastructure plan is approved and financed by the Swedish government.</i>
Social Value Assessment	<i>Social value assessment is part of the four step principle and is described in the answers above.</i>
Cost, Budget and Risk Management	<i>All of our projects are required to execute cost, budget and risk management. Exactly how this is planned and executed is described in our project management process.</i>
Programme Management	<i>Some of our project are part of a programme. All projects with a budget larger than 500 million Euro are usually executed through programme management i.e our programme management process.</i>
Procurement and Funding Routes	<i>All procurements are made according to the Public Procurement Act. Exactly how procurements are planned, executed and evaluated is described in our procurement process.</i>
Construction Strategy	<i>The construction strategy is developed throughout the following processes: Four step principle, life cycle cost (LCC), planning process and technical standards and regulations. We have a task from the government to promote innovation and productivity. Procurement strategies, such as design- and build contracts containing functional requirements, are used for this purpose. A few of our common issues are:</i>
Common issues encountered	<i>· Stakeholder and public engagement/consultation is time consuming</i> <i>· Application for review of the approved road plan</i> <i>· Lack of time- and quality control during the design phase</i> <i>· Inadequacies in our tender documents for the design- and construction phase</i>
Country category	<i>High-Income Country</i>
Country	<i>Sweden</i>
	<i>Road planning and building are made through a comprehensive planning process. The process starts with the identification of shortcomings in the current transportation system. We then investigate how these can be improved or reduced through a "Strategic choice of measures". The study describes the identified problems and shortcomings, and deal with which types of measures that are possible in order to solve a transportation problem.</i>
	<i>The choice of measure study is made according to the 'four step' principle in order to get the maximum benefit of the resources invested. This is the philosophy we make use of both in the choice of measures study and when we plan the solutions in more detail.</i>
Problem Identification	<i>The results are then placed in a so called "Bank of measures". From there, they are picked out and put into the National infrastructure plan. Based on this plan, the measures are then selected for further detailed planning.</i> <i>(Longterm planning of the transportsystem, Collect and process road and railway data/information, Plan execution of transport plans, Plan actions on roads and railways)</i> <i>A road project must be planned according to a particular process governed by laws, and which finally leads to a road plan. The process is called the planning process and the work on producing a road or railway plan is called planning. The planning process studies where and how the road is to be constructed. How long it takes to get an answer depends on the size of the project, how</i>

	<i>many studies are required, whether there are alternate routes, what budget exists and what those affected think. The results of the planning process and the design of the road is described and reported in a road plan.</i>
Considering Breadth of Outcomes	
Comparing and Appraising Options	<i>see above</i>
Traffic Modelling Robustness	<i>see above</i>
Sustainable Development (e.g. carbon)	<i>Sustainable development is part of the four step principle. Environmental assessment, and required parts of our Swedish environmental law (Miljöbalken), are integrated in our Planning process. For example, many of our projects are required by law to execute an environmental impact assessment which has to be approved by either the county administrative board or our government.</i> <i>Additional environmental actions that our projects are required to plan and execute are described in our environmental management process.</i>
Environmental Assessment	<i>see above</i>
Stakeholder and Public Engagement	<i>Stakeholder and public engagement/consultation are all part of the processes described above.</i> <i><u>Our technical standards are public and can be found here: https://puben.trafikverket.se/dpub/sok</u></i> <i><u>All of them are specific Swedish standards, and the EU directives, such as the Road Safety Standard (Directive 2008/96/CE), some of the tunnels standards (Directive a 2004/54/CE) and construction material (UE 305/2011, are integrated in our technical standards and regulations.</u></i>
Technical Standards and Approval	
Economic Assessment and Modelling	<i>We are not sure what the meaning of this question is?</i> <i>The national infrastructure plan is approved and financed by the Swedish government.</i>
Social Value Assessment	<i>Social value assessment is part of the four step principle and is described in the answers above.</i>
Cost, Budget and Risk Management	<i>All of our projects are required to execute cost, budget and risk management. Exactly how this is planned and executed is described in our project management process.</i>
Programme Management	<i>Some of our project are part of a programme. All projects with a budget larger than 500 million Euro are usually executed through programme management i.e our programme management process.</i>
Procurement and Funding Routes	<i>All procurements are made according to the Public Procurement Act. Exactly how procurements are planned, executed and evaluated is described in our procurement process.</i> <i>The construction strategy is developed throughout the following processes:</i>
Construction Strategy	<i>Four step principle, life cycle cost (LCC), planning process and technical standards and regulations. We have a task from the government to promote innovation and productivity. Procurement strategies, such as design- and build contracts containing functional requirements, are used for this purpose.</i>
Common issues encountered	<i>A few of our common issues are:</i> <i>· Stakeholder and public engagement/consultation is time consuming</i>

- *Application for review of the approved road plan*
- *Lack of time- and quality control during the design phase*
- *Inadequacies in our tender documents for the design- and construction phase*

Country category Country	High-Income Country United Kingdom
Problem Identification	<i>Project development typically follows a 7 stage process. The 7 stages are:</i> <i>Pre-project</i> <i>0) Strategy, shaping and prioritisation</i> <i>Options phase</i> <i>1) Option identification</i> <i>2) Option selection</i> <i>Development phase</i> <i>3) Preliminary design</i> <i>4) Statutory procedures and powers</i> <i>5) Construction preparation</i> <i>Construction phase</i> <i>6) Construction, commissioning and handover</i> <i>7) Closeout</i> <i>The approach to problem identification varies across the 4 nations prior to Stage 1 (as above). The processes typically identify projects based on:</i> <i>- Strategic and planning context</i> <i>- Existing and planned land use and economic development</i> <i>- Journey times and congestion</i> <i>- Safety performance</i> <i>The problem and need for the scheme will then be validated in Stage 1.</i> <i>The breadth of the outcomes for a project are typically focused around:</i> <i>- economy,</i> <i>- environment, and</i> <i>- social aspects.</i> <i>Project objectives will also be influenced by local plans and issues, e.g. within Wales there is sustainable development legislation (Future Generations Act). Stages 1 and 2 are focused on identifying a robust understanding of the existing situation, developing options and comparing them to select the preferred option.</i>
Considering Breadth of Outcomes	<i>- economy,</i> <i>- environment, and</i> <i>- social aspects.</i> <i>Project objectives will also be influenced by local plans and issues, e.g. within Wales there is sustainable development legislation (Future Generations Act). Stages 1 and 2 are focused on identifying a robust understanding of the existing situation, developing options and comparing them to select the preferred option.</i> <i>- Stage 1 – the purpose is to identify the advantages, disadvantages and constraints of broadly defined improvement options, producing an environmental constraints map and identifying key issues;</i> <i>- Stage 2 – assessment of identified range of scheme options, suitable for public consultation, based on more information than at Stage 1, allowing comparison between alternatives and identifying the significance of effects; and</i> <i>- Stage 3 – assessment of the Preferred Scheme involving a detailed assessment of all issues and preparation of an Environmental Statement or Stage 3 Scheme Assessment Report to DMRB 11.3.1.</i>
Comparing and Appraising Options	<i>The appraisal of different options is undertaken using WebTAG (Web based Transport Appraisal Tool) or other similar tools in Scotland and Wales. This tool provides a standard framework for comparing the performance of different options against transport, economic, environmental and social aspects. WebTAG also includes an Early Assessment Tool (EAST) which allows quick and simple comparison of options.</i>
Traffic Modelling Robustness	<i>Traffic models are developed throughout the early stages of the project, i.e. it will become more detailed during Stages 1, 2 and 3. WebTAG provides guidance on traffic model development and the accuracy/approach to validation of the traffic model. The typical stages of the traffic model</i>

	development are; - Traffic Surveys - Development of Base Model - Development of Growth Rates - Development of Forecast Models - Assessment of Options Aspects of Sustainable Development are considered within WebTAG and the Stage 3 Environmental Assessment process (link). The breadth of the environmental assessment has increased in recent years and now includes: 1) air quality; 2) cultural heritage; 3) landscape; 4) biodiversity; 5) geology and soils; 6) material assets and waste; 7) noise and vibration; 8) population and human health; 9) road drainage and the water environment; 10) climate.
Sustainable Development (e.g. carbon)	
Environmental Assessment	The assessment of environmental effects, reporting of assessments and monitoring of significant adverse environmental effects, aligns with the requirements of the Directive 2011/92/EU as amended by 2014/52/EU. Environmental Assessments are required by European legislation and undertaken in accordance with UK guidance (link). The level of assessment is based on size and nature of the scheme, and the screening and scoping undertaken at the start of the project. Stakeholder and public engagement is undertaken throughout the development and delivery of projects, and can be categorised in two parts: - Stakeholder/public engagement, liaison and consultation, and - Statutory Consultation required by law. Stakeholder/public engagement will be undertaken through the development of the project, with the nature and detail of discussions increasing as the project progresses. Statutory Consultation is required on the orders/planning documents and the Environmental Statement and is usually undertaken in Stage 3. Technical Standards are published for the whole of the UK - link. The standard provides requirements which designers shall follow, approval from the client in the form of a 'Departure' is required where requirements cannot be met. The standards also provide advice and additional notes to support the design development.
Stakeholder and Public Engagement	
Technical Standards and Approval	The standards include various key processes to ensure quality: - Approval in Principle (AIPs) to agree design approach for structures and large earthworks; - Levels of independent checking for structures/earthworks; - Road Safety Audits; - Departures Process (as outlined above) requiring client approval. Economic assessment of the project is undertaken in accordance with WebTAG guidance, which aligns with the Governments Green Book guidance on presenting business cases. The economic assessment typically considers benefits/costs associated with: - Journey times
Economic Assessment and Modelling	

	- Accident numbers and severity - Vehicle Operating Costs - Construction and maintenance costs. WebTAG also allows the consideration of Wider Economic Benefits (link). These include productivity gains resulting from improvements in how well businesses are connected to each other as well as potential employees, and benefits arising from structural changes as businesses and households relocate.
Social Value Assessment	Considered as part of the appraisal and assessment processes. - WebTAG Social Impact Guidance - link - DMRB Population and Human Health Guidance - link The approach to cost estimation of a project varies for different client bodies but typically include construction costs, planning and design costs, land and utilities costs. However, guidance is provided on the presentation of the cost estimate and the risk management (link).
Cost, Budget and Risk Management	In addition to risk management guidance also requires consideration/inclusion of Optimism Bias for different stages of the project development. Optimism bias is the demonstrated systematic tendency for appraisers to be overly optimistic about key parameters. Theories on cost overruns suggest there are several means by which optimism bias could be caused, including the psychological tendency for humans and organisations to favour optimism, the economic rationale of advancing projects in which organisations have interests in, and the strategic behaviour of stakeholders involved in the planning and decision-making processes.
Programme Management	The approach to Programme Management varies for different client bodies, however typically a series of stage gate reviews are used to manage the transition of projects between stages. In terms of the construction programme, an initial programme would be developed at an early stage and developed by the project team. Funding is provided by central or regional governments based on a Business Case prepared in accordance with the guidance/standards.
Procurement and Funding Routes	Procurement is undertaken in accordance with EU directives, following procedures developed by each client. Most highways schemes in the UK are currently procured through Build Only or Design and Build contracts. There are a small number of PPP schemes. The planning and development of large highway projects will include buildability expertise prior to fixing the land boundary. This has been via both Early Contractor Involvement contracts or as technical support to a designer led team. This advice allows the early development of a draft construction strategy so land can be included, and impacts considered in the environmental assessment.
Construction Strategy	Planning and Design Phase: - Stakeholder comments and challenge, - Budget challenges as scope/level of detail of project increase,
Common issues encountered	- Lack of/changes to site information (ground conditions / environmental constraints). Construction Phase: - Unexpected constraints (e.g utilities/services); - Addition / changes to scope of works

Country category	Upper Middle-Income Country
Country	China
Problem Identification	<i>At the national level, the China National Highway Network Planning (2013-2030) provides that every county in China shall be connected by a national trunk highway, and every city with a population over 200,000 by an expressway, with regard to economic and social development, national defense, urban development and other modes of transport. Planning responsibilities are shared between the State, provinces and municipalities based on the road level considered.</i> <i>Objectives are to:</i> - expand essential social services; - advance new-type urbanization; - balance equity and efficiency; - achieve coordinated development of source and environment, - accomplish a comprehensive transport system.
Considering Breadth of Outcomes	<i>They are analyzed in a feasibility study, which follows detailed rules established by the Ministry of Transport for all components: options appraisal, traffic modelling, stakeholders' engagement, technical standards, etc.</i> <i>The feasibility study comprises a preliminary study dealing with urban, economic, social and traffic planning, as well as an engineering feasibility study.</i>
Comparing and Appraising Options	<i>Preferred option is determined based on technical, economic, safety and environment analysis.</i>
Traffic Modelling Robustness	<i>Origin-destination data are used in traffic prediction models, that allow to compare the preferred option with alternative solutions in the engineering feasibility study.</i>
Sustainable Development (e.g. carbon)	<i>China's National Plan on Climate Change (2014-2020) demands energy-savings and low-carbon efficiency in the transport system (use of environmental materials in highway works, intelligent control system for lighting and ventilation in tunnels, reduction of carbon emissions during the whole life cycle of highways). China National Highway Network Planning (2013-2030) emphasizes the effectiveness of the highway network to achieve sustainable development.</i>
Environmental Assessment	<i>The "Law of the People's Republic of China on Environment Impact Assessment" provides that an environmental impact assessment should be worked out, comprising the analysis, prediction, evaluation of adverse environmental impacts and the proposal of countermeasures to prevent or mitigate them. If necessary, the opinions of relevant units, experts and the public should be sought before the business case is submitted for approval. Investigating the degree of support of the local government, enterprises, residents, and major highway users need to be done. For highway construction projects that require large-scale resettlement, it is necessary to formulate relevant resettlement plans. The specific method is as follows: solicit the opinions of communities through e.g. questionnaires, surveys and on-site visits, find and list the risk points and the possibility of risk occurrence and the degree of impact, propose measures to prevent and resolve risks. Consensus is sought through consultation.</i>
Stakeholder and Public Engagement	

Technical Standards and Approval	Highways are divided into national, provincial, county, and township highways. They are also divided into high, first-class, second-class, and third-class highways, depending on their technical level. Different standards are applied. Besides, based on traffic capacity and service level analysis, specific indicators are prescribed in the "JTG B01-2014 Technical Standard of Highway Engineering" for technical level, design speed, number of lanes, roadbed width, standard load, seismic standards, tunnels, traffic engineering and facilities along the route.
Economic Assessment and Modelling	In addition to the MOT Feasibility Study rules, "Economic Assessments Methods and Parameters for Construction Project" have been established by the National Development and Reform Commission both for financial analysis and economic analysis.
Social Value Assessment	According to the MOT rules, the following items are assessed: impact on residents' income, living standards and quality; employment; effects on different interest groups, disadvantaged groups, impact on local culture, education, health, ethnic customs, and religion. References are: "Standard Method of Cost Estimation for Highway Infrastructure Projects" and "Initial Cost Estimation Quotas for Highway Projects" of the Ministry of Transport. When there is a significant difference between the estimation of the engineering feasibility study and the pre-feasibility study, the reasons should be explained.
Cost, Budget and Risk Management	Risk analysis should be carried out for particularly complex major projects. The risk level is determined according to the degree of influence of each risk factor on the project and the probability of risk, with expert evaluation method, risk factors, and risk probability analysis. According to different risk factors, the corresponding countermeasures should be put forward. Risk analysis is also conducted regarding social stability. Reference is the "Code for Construction Project Management GB/T50306-2017" of the Ministry of Housing and Urban-Rural Development.
Programme Management	According to the "Bidding Law of the People's Republic of China (2017 Amendment)", if necessary, the tenderer shall properly divide the project into sections or phases, and provide clear information on the sections and phases in the bid-invitation documents. The following methods of procurement are available: 1) public bidding; 2) invitation-based bidding; 3) competitive negotiations; 4) single-source purchases; 5) price inquiries; 6) other ways of procurement as recognized by the departments of the State Council in charge of the supervision and administration of procurement. Public bidding is the primary procurement approach. In raising funds for highway construction, governments at all levels may collect special charges or solicit loans from domestic and international financial organizations according to law and relevant provisions of the State Council on their own decisions. The State encourages investments for highway construction by domestic and international organizations.
Procurement and Funding Routes	According to the "Standard Method of Cost Estimation for Highway Infrastructure Projects ([2010]No. 178)" of the Ministry of Transport, the construction conditions and characteristics of the project should be analyzed, the key points that determine the project schedule, quality and cost should be studied, and the schedule arrangement of the construction period should be put forward. For reconstruction and expansion projects, the
Construction Strategy	

traffic organization plan during the construction period should be considered.

The first issue refers to the coordination and communication among diverse stakeholders, often taking plenty of time in the project preparation stage. It is a matter of balance between time constraints and the depth of communication with stakeholders. In practice, the issue of land requisition and demolishing often influence the project schedule. Another issue is the uncertainty and risks deriving from technical complexity or inaccurate prediction of the geological conditions. In the planning stage, it is difficult to guarantee the technical scheme's accuracy, which evolves and changes over time as the working or unexpected conditions occur. The cost estimation can be influenced, as well as the implementation of actual technical schemes.

Common issues encountered

Country category	Upper Middle-Income Country
Country	Mexico
Problem Identification	<i>Projects are identified in a six-year government plan, based on AADT (annual average daily traffic), and possibly also economic developments that have an impact on roads, as well as improvement of safety on dangerous sections.</i>
Considering Breadth of Outcomes	<i>Standard procedures established by the Ministry.</i>
Comparing and Appraising Options	<i>Time constraints often prevent to evaluate alternative solutions. There is a Geometric Project Manual.</i>
Traffic Modelling Robustness	<i>Geometric Project Manual, Road Data Book.</i>
Sustainable Development (e.g. carbon)	<i>Hardly discussed, only environmental regulations are considered.</i>
Environmental Assessment	<i>There is a General Law of Ecological Balance and Environmental Protection. An Environmental Impact Statement describes the main activities of the work, including the maintenance of machinery and equipment, attention to flora and fauna, etc. and Land Use Change if trees have to be cut to build the road.</i>
Stakeholder and Public Engagement	<i>No public consultations, everything is done by the SCT (Ministry).</i>
Technical Standards and Approval	<i>SCT Normative: http://www.sct.gob.mx/carreteras/direccion-general-de-servicios-tecnicos/normativa/</i>
Economic Assessment and Modelling	<i>Cost Benefit Analysis (CBA) is made, and approved by the Secretary of Finance and Public Credit. If the CBA is not available, the resources are not released even though the Chamber of Deputies has approved it.</i>
Social Value Assessment	<i>It comes along with the CBA. For rural roads, the evaluation is only social.</i>
Cost, Budget and Risk Management	<i>Responsibility of SCT, who also manages resources.</i>
Programme Management	<i>It is carried out by SCT, both for works that SCT builds, and for APP (Public Private Association). There are contracts for supervision and monitoring of the work, including control and verification of quality.</i>
Procurement and Funding Routes	<i>Fiscal through taxes or private through private investment (APP).</i>
Construction Strategy	<i>According to authorized Program and Budget</i>
Common issues encountered	<i>Political pressure does not allow to elaborate the projects, analyze alternatives. Problems of land acquisition, obtention of environmental permits. Lack of budget. Construction companies lack economic capacity. Low initial prices lead to cost overruns, delays due to e.g. utilities works. Dissatisfaction of neighbors, etc.</i>



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