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Transport Dialogue and Networks Interoperability

Annex 1 – EaP Prioritization Methodology

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1. Premise

This note presents a methodology for prioritizing transport and logistics projects within the context of the extension of the core TEN-T network to the Eastern Partnership (EaP) countries. The objective of this methodology is to create a pipeline of priority projects. The approach presented below is the first of a two-step procedure which results in an identification of a pipeline of priority projects for EaP countries. While this first step concerns all projects irrespective of their degree of maturity and the information available, the second step is mainly quantitative and covers only mature projects for which a substantial part of the supporting analysis has been completed.

This note has been organized as follows. Section 2 introduces the main objectives of the proposed prioritization-process methodology for this first step and the specific characteristics of the approach. Section 3 illustrates the whole prioritization process and the supporting tools. In Section 4, project-screening criteria are presented as a prerequisite to be met in order to access the evaluation and prioritization phases. Section 5 introduces the evaluation criteria deemed necessary to identify priority projects and the maturity index. Section 6 outlines the methodology used to define the relative importance of criteria (weights definition). Finally, Section 7 provides more detail on the online tools which support the whole process. This note does not cover the objectives, methodology and characteristics of the second step which is to be taken once a pipeline of priority projects has been identified.



2. Introduction to the prioritization process

2.1 Main objectives

The objective of the prioritization process is to obtain a list of priority transport and logistics infrastructure projects of genuine regional or sub-regional significance. Projects should be prioritized according to their degree of contribution to a balanced, sustainable development of the core TEN-T network extension to the East, in terms of their economic, environmental and social impacts.

In order to achieve this objective, projects should comply with one or more of the following characteristics:

- **Improving the movement of goods and passengers** within the region (intra-regional) and between the regions (inter-regional). In this respect, projects on corridors, border crossing, waterways, airports and ports play a key role.
- Contributing to an **optimized use of each transport mode**. This will provide the most suitable solutions in the long term by delivering advantages for operators in terms of reducing international transport costs and improving the overall efficiency of the system through enhanced connectivity between countries.
- Contributing to the **re-balancing of transport modes** in favour of those with the most carbon-neutral effect and high safety and security standards. Within the EaP region this means fostering a multimodal approach by attributing a key role in long-distance freight transport to railways and inland waterways networks, improving transport nodes and particularly ports, and creating an efficient network of inland connections.
- Having **national and international ownership**. Projects need strong national ownership and their development throughout the decision-making process should be accompanied by the political support of all the partner countries involved.

Project prioritization of EaP transport and logistics projects is based on the extent to which each project contributes to fulfilling the goals of the Eastern Partnership Strategy, namely:

- **Improving transport operation, safety and security** through a reduction in the number and severity of accidents caused by international traffic and a reduction in security incidents of international operators.
- **Improving economic efficiency**, mainly through cost savings for international users of the transport system and operators offering transport services.
- **Enhancing environmental sustainability** of the transport system through a reduction in air pollution, noise, greenhouse gases and other environmental impacts.

2.2 Proposed approach

The approach presented herein takes stock from previous exercises in this field and has been further developed to increase its comparability with other existing approaches, in particular the methodology applied within the South East Europe Transport Observatory (SEETO). It should be noted that, due to different objectives and different statuses of projects and the process of prioritization, some differences will inevitably exist between the prioritization processes to be performed in the context of the EaP and those undertaken in other international programmes. Indeed, the SEETO methodology has been specifically developed in order to prioritize only projects



eligible for funding that are “mature enough to start”, while the proposed approach for the EaP prioritization exercise is applied in an earlier stage of the project cycle. More precisely the EaP approach has been specifically designed to also allow the evaluation of projects with a lower or no level of maturity; these projects may still require some preparatory work to be undertaken in order for their feasibility to be fully determined and whose their request for funding is primarily driven by the necessity to finalize or start the preparatory work.

The prioritization methodology presented herein has therefore been specifically designed to perform a preliminary qualitative assessment of projects. A more mature methodology following a more quantitative approach has to be designed once detailed information on projects is available.

The following chapters illustrate the main principles and working assumptions underpinning the prioritization approach, including the evaluation criteria adopted and the online tools developed to allow for the involvement, if needed, of multiple evaluators. The methodology developed is quite comprehensive and the list of evaluation criteria proposed is deliberately quite wide.

It is worth emphasizing that, at this stage of the process, the information made available for the projects will not be sufficient to satisfy all the evaluation sub-criteria. With this in mind, the online tools for supporting the proposed approach have been designed to allow for the consideration of only a limited number of criteria or sub-criteria, to be chosen on the basis of the available information. These tools make it possible to build different priority lists of projects according not only to the weight attributed to each of the criteria, but also to the different number of criteria considered.



3. The prioritization process

The prioritization process designed for EaP transport and logistics projects has been developed along the following steps:

- 1) selecting projects to be prioritized (fulfilment of screening criteria);
- 2) designing evaluation criteria and sub-criteria;
- 3) setting the relative importance of criteria (by pairwise comparison);
- 4) evaluating the projects against a common evaluation scheme with criteria and sub-criteria;
- 5) prioritizing the projects, i.e. determining the final ranking of projects by applying criteria and sub-criteria weights.

To support this multi-step process, a set of online interlinked tools has been specifically developed:

- a) an EaP transport projects database;
- b) a tool for defining criteria weights;
- c) a projects prioritization tool.

The EaP transport projects database is an online database which includes projects that have either been i) presented by the EaP countries, ii) identified by previous technical assistance projects as relevant for the regional transport network, or iii) identified by international financial institutions (IFIs). This database provides a list of planned or ongoing projects in the region.

Out of this database, the projects performing successfully against the screening criteria are selected for further processing¹.

The second step of the process is related to the identification of criteria and sub-criteria to be used for prioritizing the projects. It is important to remember that, in order to allow for the consideration of projects with a low or no level of maturity, the evaluation sub-criteria have been deliberately designed to be assessed in qualitative terms. Criteria and sub-criteria are discussed and presented in Section 5.

Setting the relative importance of criteria and sub-criteria (weighting process) is the third step of the process which might involve a participatory approach of all stakeholders. In this phase stakeholders could be invited to compare the criteria following a pair-wise comparison method, as described in Section 6. To this end, an online weighting tool is being developed to use the judgments made in these comparisons in order to derive the weights that stakeholders implicitly apply to each criterion. The tool can be applied to easily re-run the weighting procedure if a new stakeholder is interested.

In a fourth step, projects are evaluated against the set of criteria and sub-criteria on the basis of the information available from the database.

Finally, in a fifth step, projects are prioritized by determining their final ranking through the application of criteria and sub-criteria weights. To support this final step, an online projects prioritization tool has been developed. The tool makes it possible to easily rank projects by

¹ As mentioned before, at this stage of the process the information for the projects available in the database will not be sufficient to satisfy all the evaluation sub-criteria designed for this exercise. Once these gaps are filled in, the supporting online tools will allow a new prioritization exercise to be run.



different stakeholders according to different sets of evaluation criteria and sub-criteria and related weights.

The projects database, the weighting tool and the prioritization tool have been developed in order to support a prioritization exercise underpinning the proposed approach. They can be easily modified in the future to accommodate new projects, to update information about the ones already part of the database and to apply new evaluation criteria and/or sub-criteria in response to an improved status of the projects and/or different aims of the prioritization exercise.

A more detailed description of the online tools is available in Section 7.



4. Project-screening criteria

The pipeline of priority projects builds on the EaP transport projects database which includes all projects proposed by countries, IFIs and other organisations. The approach is designed to prepare more restricted or wider pipelines of projects, depending on the scope of prioritization and the available information.

Four main screening criteria have been identified. By activating one or more of these screening criteria, the prioritization exercise includes (or excludes) the projects that perform positively (or negatively) against them. The screening criteria are:

1. **Geographical location.** By activating the options proposed by this screening criterion, the pipeline will include:
 - a. only projects that are part of the core TEN-T extension to the East;
 - b. Also the projects on the network accessing the core network;
 - c. all projects independently from their location.
2. **Type of investment.** By activating the options proposed by this screening criterion the pipeline will include:
 - a. only investments in physical infrastructure;
 - b. also soft measures.²
3. **Volume of investment.** By activating the options proposed by this screening criterion the pipeline will include:
 - a. only projects below a certain investment threshold.
4. **Status of the project.** By activating the options proposed by this screening criterion the pipeline will also include (or exclude) completed or almost completed projects.

The requirements proposed above could also be used by EaP countries as guidelines in the process of identification, selection and submission of interventions and measures deemed eligible for being included in the pipeline and for subsequently undergoing the prioritization process.

² Cross-border projects that may catalyse soft measures, harmonizing procedures and documentation would be an additional argument for investment.



Table 1: Screening criteria

| | | | |
|------------------------------|---|---|---|
| Geographical location | Projects on the core TEN-T extension to the East | Also projects on access link to the core TEN-T extension to the East | All projects independently from their location |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Type of investment | Only investments in physical infrastructure | | Also investments in soft measures |
| | <input type="checkbox"/> | | <input type="checkbox"/> |
| Volume of investment | Below EUR million | | |
| Status of the project | Completed or almost completed | | Other |
| | <input type="checkbox"/> | | <input type="checkbox"/> |



5. Project evaluation

5.1 Information sufficiency

A minimum set of basic **information** is required for a project to be considered for its inclusion in the EaP priority projects pipeline for transport and logistics. Ideally this minimum set should include the following basic information:

1. volume of existing traffic with respect to the shares of national, international and transit volumes (in some cases this information could be derived by the EaP transport model);
2. expected socio-economic impacts;
3. expected environmental impact;
4. countries involved in decision-making and planning process (approach used in the region to mobilize support for improvements in the corridor and to push for reforms);
5. investment costs (preliminary assessment of construction and management costs);
6. expected timeline of project phases (design, construction and operation).

Clearly, depending on the maturity of the proposed project, not all information might be available for projects at the initial development stage. This is why the prioritization process is designed to allow for a preliminary qualitative assessment of projects, and it can be developed into a more quantitative approach once detailed information on projects are available.

5.2 Evaluation criteria and project-maturity index

5.2.1 The set of criteria

A key component during a project's prioritization is the identification of suitable evaluation criteria to be used for a comparative assessment of a project's performances. This prioritization process builds on five criteria (further divided into sub-criteria):

1. regional integration;
2. technical;
3. socio-economic;
4. environmental;
5. policy-based.

Each criterion is further divided into sub-criteria, for which a number of items are available to evaluators for their replies and in relation to which an evaluation scale is applied.

"Project maturity", which is an important aspect to be taken into account, is dealt with in a separate step. Given that the EaP prioritization exercise is specifically designed to also allow for the evaluation of projects with a low or no level of maturity and, to this aim, project maturity is dealt with through a maturity index which describes the status of the project in the decision-making process (see also Section 0). While, in this first step, the "maturity index" is mainly descriptive, it plays a major role in establishing which project will be considered in the second step in which a true pipeline of priority projects is drawn up.

The five criteria are discussed in detail in the following sections.



5.2.2 Regional integration criterion

A key issue in developing a wide regional transport system is to combine national and regional interests in order to identify projects which best comply with network priorities.

The purpose of the regional integration criterion is to evaluate the degree of contribution of each project to regional integration. In order to achieve this, the evaluation should take into consideration the project's contribution to the **enhancement of trade and services exchanges** between countries as well as the contribution to **regional development** as a whole. In this context, specific relevance should be given to those projects which remove administrative and technical barriers at **border crossings**.

The evaluation of the regional integration proposed for the prioritization of EaP transport and logistics projects takes into consideration three sub-criteria:

- **Regional cooperation:** "to what extent the project is expected to increase trade and services exchanges between regions directly or indirectly connected by the project"; in this case the unit of measurement is the volume of international flows.
- **Regional development:** "if an economic impact assessment has been completed, to what extent the project is expected to impact on regional development"; in this case the answer is qualitative with three levels ranging from low to high.
- **Cross-border projects:** specific relevance should be given to those projects which remove administrative and technical barriers at border crossings; the impact might be regarded as: (i) *high* if both unified *technical standards and procedures* are to be implemented in adjacent countries, (ii) *medium* if only unified *technical standards but not procedures* are to be implemented, (iii) *low* if only unified *procedures but not technical standards* are to be implemented and (iv) *none* if neither unified *technical standards nor procedures* are to be implemented (i.e. no border-crossing project).

Table 2: Regional integration criterion – evaluation scheme

| | High (int. flows ≥ 10%) | Medium (int. flows 2 - 10%) | Low (int. flows ≤ 2%) | None |
|--|----------------------------------|------------------------------------|---------------------------------|----------------------------------|
| <i>The project impact on regional cooperation is:</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>The project impact on regional development is expected to be:</i> | High <input type="checkbox"/> | Medium <input type="checkbox"/> | Low <input type="checkbox"/> | None <input type="checkbox"/> |
| <i>The project impact on the improvement of border crossings is:</i> | High <input type="checkbox"/> | Medium <input type="checkbox"/> | Low <input type="checkbox"/> | None <input type="checkbox"/> |

5.2.3 Technical criterion

Under this criterion the project is evaluated in terms of its physical characteristics and its main expected impacts on transport demand and interoperability of networks. Therefore, in principle, the technical evaluation of projects should consider aspects such as:

- The contribution of the project to network **interconnectivity**, e.g. by creating a new link or node or upgrading existing ones.



- The impacts on **intermodality**, i.e. the project's contribution to the optimized use of each transport mode and to providing efficient opportunities for interchange at the routes' nodes.
- The project's contribution to **improved efficiency** of the regional transport system (e.g., to be measured in terms of **reduced transit times** and/or **reduced transportation costs**, as well as in improved **cargo safety and reliability** of intra- and inter-regional traffic).
- **Enhancement of safety and security levels** by deploying measures to elevate standards beyond minimum requirements. For example, actions with regard to **road networks** (independent carriageways, interchanges to separate crossing levels and information route guidance), **rail infrastructures** (high level signalling specifications and advanced communication systems enabling high speed data transfer) and **maritime and aviation** (advanced navigation systems and modern facilities for meteorological services).
- **Technical feasibility** of the project, i.e. whether the project is relatively feasible from an engineering point of view and does not require extreme and expensive solutions in terms of structural engineering works (e.g., tunnels, bridges etc.).
- **Adherence to minimum common technical standards** available in the region (e.g., in terms of rail gauge, number of tracks/lanes, signalling systems, etc.).

While all projects are functional to the completion of the TEN-T core network extension to the East, some may be considered more relevant than others. As an example, projects could be reviewed in terms of their contribution to improved **interconnectivity** of the regional network (e.g., bridging missing links, removing bottlenecks notably in cross-border sections, etc.). Under this perspective, **new or upgraded infrastructure projects** (both at link and node level) which complete the network and enhancing accessibility to land-locked countries might be reviewed as more strategic than the others. Notably, interventions on interoperability which are designed to generate significant savings on costs and transport travel time can catalyse higher attention and strengthen arguments for investment.

The proposed technical sub-criteria take into account:

- Impacts in terms of **creating a new link or node or upgrading existing ones**.
- The **prevailing component** of traffic volume i.e. whether it is freight- or passenger-related.
- Whether the **expected or existing traffic volume** is (i) *high*, (ii) *medium*, (iii) *low* or (iv) *not available*.
- Impacts on **intermodality**, which may be regarded as: (i) *high* if problems of intermodality cease to exist, (ii) *medium* if intermodal connections are improved, (iii) *low* if intermodality is only indirectly influenced by the project, and (iv) *none/not available* when no effects on intermodality are expected or information on expected impacts is not available.
- Impacts on **reliability**, which may be regarded as: (i) *significant* if serious reliability problems are eliminated, (ii) *medium* if reliability is slightly improved, (iii) *low* if the project only has indirect impacts, and (iv) *none/not available* if no effects on reliability are expected or information on expected impacts is not available.
- Impacts on **safety**, which may be regarded as: (i) *significant* if serious safety problems are eliminated, (ii) *medium* if safety is slightly improved, (iii) *low* if the project only has indirect impacts, and (iv) *none/not available* if no effects on safety are expected or information on expected impacts is not available.
- Impacts on **security**, which may be regarded as: (i) *positive* if the project addresses security problems, (ii) *neutral* if security is not an issue that is being considered.



Table 3: Technical criterion – evaluation scheme

| | | | | |
|--|--------------------------|--------------------------|--------------------------|----------------------------|
| The project creates a new link or node or upgrades an existing one: | Upgrade | | New | |
| | <input type="checkbox"/> | | <input type="checkbox"/> | |
| The prevailing traffic is: | Freight | | Passenger | |
| | <input type="checkbox"/> | | <input type="checkbox"/> | |
| The expected/existing traffic volume is: | High | Medium | Low | Not available |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The project's impacts on intermodality are: | High | Medium | Low | None/ Not available |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The project's impacts on reliability are: | Significant | Medium | Low | None/ Not available |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The project's impacts on safety are: | Significant | Medium | Low | None/ Not available |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The project's impacts on security are: | Positive | | Neutral | |
| | <input type="checkbox"/> | | <input type="checkbox"/> | |

5.2.4 Socio-economic criterion

The expected socio-economic impacts are important components of the overall viability of an individual project. Care must be taken that the project has a positive impact on socio-economic development and that the resources invested are fully justified from an economic point of view.

The economic evaluation is usually based on **estimations of costs and benefits**. The **predominant cost** is that of construction, followed by maintenance and operational requirements. On the other hand, there are benefits in terms of reduction of travel time, vehicle operating costs (VOCs) and externalities (local and global pollutants, accidents and congestion).

The socio-economic criterion proposed for the prioritization of EaP transport and logistics projects in this exercise is mainly qualitative since a quantification of benefits is rarely available among the projects currently included in the database. Therefore the evaluation is limited to the nature of the main expected impacts, in particular whether the expected benefits are mainly costs savings, time savings and/or a reduction in negative externalities (i.e. accidents, emissions, energy consumption).

At the same time, the evaluation aims to measure the estimated investment costs by grouping them into three categories: (i) *below Euro 5 million*, (ii) *between Euro 5 million and 30 million*, (iii) *and over Euro 30 million*. This is linked to the estimated investment period, which is considered as



well as both costs and completion time are two project characteristics that impact on the evaluation of project risk. Again, three thresholds are proposed for the completion time: (i) *3 years or less*, (ii) *between 3 and 6 years*, and (iii) *longer than 6 years*.

Table 4: Socio-economic criterion – evaluation scheme

| | | | | |
|--|----------------------------|---|---|------------------------------|
| Prevailing impact ($\geq 50\%$ on total impact) | Time | Costs | Externalities | Other |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Second relevant impact | Time | Costs | Externalities | Other |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Estimated investment volume | Below EUR 5 million | Between EUR 5 million and 30 million | Between EUR 30 million and 100 million | Above EUR 100 million |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Estimated investment period | 3 years or less | Between 3 and 6 years | | Longer than 6 years |
| | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> |

5.2.5 Environmental criterion

Negative and positive impacts on the environment are clearly crucial when analysing transport projects. Under this perspective, projects with a high potential of **rebalancing transport modes in favour of those with the most carbon neutral effect** are expected to play a key role in reducing emissions from the sector and should be evaluated according to their emission- and energy-saving potential.

In general, the evaluation of the project from an environmental perspective should focus on impacts on the physical environment (both locally and globally) and on non-users (e.g., local residents). Technical solutions should be optimized and targeted to achieve selected standards in order to mitigate the **emission of pollutants and noise, visual appearance and community severance**.

The environmental criterion proposed for the prioritization of EaP transport and logistics projects looks at **expected positive or negative impacts that arise both from infrastructure and traffic**. Negative environmental impacts are usually tied to the completion of the infrastructure and might require (i) mitigating interventions and may therefore increase investment costs, or (ii) negotiating with the people affected and may therefore increase completion time. Positive environmental impacts emerge when a reduction in emissions, noise, etc. is made possible by interventions in terms of route shortening, traffic diversion, elimination of congestion, etc.



Two sub-criteria are in this regard.

- i. The first one deals with **adverse environmental impacts of the infrastructure** and requires an assessment of whether the infrastructure has (i) *minimal* effects (only minor mitigating interventions might be required), (ii) *serious* effects (expensive mitigating intervention required), or (iii) *irreversible* effects (no mitigating intervention is possible).
- ii. The second criterion is linked to the **environmental impacts of traffic** which can be measured through changes in emission due to traffic: (i) *positive* indicates a reduction in emissions, noise, energy consumption, (ii) *minimal*, (iii) *medium*, or (iv) *negative* indicates that there has been an increase in emissions or, finally (v) *none* where no impacts are expected.

Table 5: Environmental criterion – evaluation scheme

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Environmental impacts of the infrastructure | Minimal | | Serious | | Irreversible |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Environmental impacts of traffic | Positive | Minimal | Medium | Negative | None |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5.2.6 Policy-based criterion

The last evaluation criterion concerns the policy context and, more specifically, how the projects fit into each country's strategy for developing the transport infrastructure network. This aspect also has a strong relevance for the development of transnational networks, and it is therefore of utmost importance for priority projects to be accompanied by genuine and **strong support both at national and international level** as well as for their strategic relevance to be adequately reflected within official transport planning documents.

On the one hand, the evaluation of the policy-based criterion proposed for the prioritization of EaP transport and logistics projects looks at the status of the project at **national** level i.e. whether (i) it is coherent with the **national transport master plan/strategy**, or (ii) it is coherent with **other national planning or policy documents** that are less relevant than a national master plan or (iii) it is a totally new project.

On the other hand, the assessment deals with transboundary projects and considers the **international commitment** to the project of other countries *excluding the presenting country*, i.e. whether (i) the project is endorsed by more than one country, (ii) it is endorsed only by one country but will need broader endorsements in order to secure its implementation or (iii) it does not require any international commitment.

Finally, any **dependency on the completion of other projects** is also considered as this is an external variable that might affect project implementation. Here, three possibilities are identified: (i) the project does not depend on any other project, (ii) it is dependent on a project that is already ongoing, or, finally, (iii) it depends on investment that has not yet started.



Table 6: Policy-based criterion – evaluation scheme

| <i>Project status</i> | Coherent with national transport master plan/strategy | Coherent with other national policy documents | New project |
|--|--|--|---|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>International commitment of other countries</i> | YES | No, but will need | No international commitment required |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Project depends on completion of other upstream investments</i> | NO | YES | YES |
| | <input type="checkbox"/> | Investment already ongoing/ready | Investment not yet started |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5.2.7 The project-maturity index

The project-maturity index provides additional information on the degree of readiness of the project and its status in the project cycle, from preliminary design to full feasibility. It builds on five components:

- i) project assessment status,
- ii) economic performance indicators,
- iii) financial profitability and sustainability,
- iv) environmental assessment, and
- v) readiness for implementation.

The **project assessment status** considers the level of implementation by distinguishing whether (i) pre- and/or (ii) feasibility studies are already available, (iii) an estimation of investment and operational costs has already been carried out, (iv) studies are currently ongoing or, lastly, (v) no action has been undertaken.

In addition, two economic performance indicators are included in the maturity index: the project's **Economic Net Present Value (ENPV)** and its **Economic Internal Rate of Return (EIRR)**. ENPV and EIRR are the indicators normally used to assess the overall socio-economic and financial viability of projects. The maturity index considers the existence of (i) both indicators, or (ii) only one, or finally (iii) neither of them.

Analyses of financial **profitability and sustainability** provide evidence of the performance of the technical options considered. This is an important condition to be met in order to obtain government approval, to be included in national budget funding plans and to quantify the needs for external financing (namely, a possible funding gap). An analysis of financial **profitability** requires the preparation of a project cash flow calculated on the basis of the difference in cost and revenues with and without the project. Financial **sustainability** aims to assess whether the project has any risk of running out of cash in the future. Since an assessment of financial sustainability is hardly possible at the pre-feasibility stage, in this case the assessment can be limited to a profitability analysis and be based on approximate investment and management costs and traffic revenues (consistent with traffic volume forecasts). The maturity index therefore considers whether



(i) both a financial profitability and a sustainability analysis have been carried out, or (ii) only one has been undertaken or (iii) neither of them exist.

An **Environmental Impact Assessment (EIA)** of a project provides evidence regarding a possible alleviation of emissions (noise and pollution), relief of congestion and any reduction of environmental impacts on affected communities. The status of the environmental assessment, whether it has been fully or only partially performed or whether the project is still in a preliminary phase and the assessment has not yet been carried out, is a component of the maturity index. Three possibilities are considered here: (i) the project has already undergone a full EIA; (ii) some preliminary, not fully formalized, assessment of environmental impacts is available, or (iii) the environmental assessment has not yet started.

Finally, the last component considers the project's **readiness to** apply for funding, and three thresholds are established in this regard: (i) immediately, (ii) less than 3 years, or (iii) more than 3 years.

The designed maturity index ranges from 0 to 10 and is calculated by adding up the score of all its components. **Table 7** summarizes the maturity index components.

Table 7: Maturity index components

| <i>Project assessment status</i> | Feasibility | Pre-feasibility | Estimated costs | Ongoing studies | No action |
|--|--------------------------|--------------------------------------|--------------------------|-----------------------------|--------------------------|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Economic performance indicators (ENPV EIRR)</i> | Both exist | Only one exists | | Neither exists | |
| | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | |
| <i>Financial profitability and sustainability analysis</i> | Both exist | Only one exists | | Neither exists | |
| | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | |
| <i>Environmental impact assessment</i> | Full EIA | Preliminary impact estimation | | Does not exist | |
| | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | |
| <i>The project is ready for implementation</i> | Immediately | In less than 3 years | | In more than 3 years | |
| | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | |



6. Setting the relative importance of criteria and sub-criteria

An important element in the prioritization process is the identification of the relative importance of different criteria and sub-criteria by defining weights. These weights can be directly set by evaluators and/or derived from a participatory process involving all relevant policymakers and stakeholders.

In this respect, the Analytic Hierarchy Process (AHP) is widely used to develop weights in many types of prioritization applications. AHP provides a way for stakeholders to express their relative priorities by comparing each criterion to any other, as illustrated in **Table 8**. The judgments made in these comparisons can then be used to derive the weight that stakeholders implicitly apply to each criterion.

Table 8: Setting the relative importance of criteria for project prioritization

| | | | | |
|----------------------|-----|---------------------------|-------------|----------------------|
| Regional Criteria | are | | compared to | Technical Criteria |
| Regional Criteria | are | | compared to | Economic Criteria |
| Regional Criteria | are | | compared to | Environment Criteria |
| Regional Criteria | are | 4 More Important | compared to | Policy Criteria |
| Technical Criteria | are | 3 Slightly more Important | compared to | Economic Criteria |
| Technical Criteria | are | 2 Equally Important | compared to | Environment Criteria |
| Technical Criteria | are | 1 Slightly less Important | compared to | Policy Criteria |
| Economic Criteria | are | 0 Less Important | compared to | Environment Criteria |
| Economic Criteria | are | | compared to | Policy Criteria |
| Environment Criteria | are | | compared to | Policy Criteria |

Source: IDEA Project, 2009

Five criteria compared to each other give rise to ten pair comparisons in total. Each pair therefore has a 'weight' of 0.1 (or 10%) in the explanation of how relevant criteria are. At the same time, the result of each comparison is expressed on a rating scale ("more important", "slightly more important", "equally important", "slightly less important"). In order to take this into account, the total weight of each pair is split between the two criteria as follows:

- When one criteria is rated as "more important" (rate 4) it gets the whole weight (0.1) while its counterpart gets 0;
- When one criteria is rated as "slightly more important" (rate 3) it gets a weight of 0.075 while its counterpart gets 0.025;
- When one criteria is rated as "equally important" (rate 2) it gets a weight of 0.05 and its counterpart also gets 0.05;
- When one criteria is rated as "slightly less important" (rate 1) it gets a weight of 0.025 while its counterpart gets 0.075;
- When one criteria is rated as "less important" (rate 0) it gets 0 while its counterpart gets the whole weight of 0.1.

The sum of the weights attributed to each criteria by the evaluator provides the average rating of that criterion. The average rating across evaluators provides the final rating used to weight criteria.



From a methodological point of view, it should be noted that the chosen split rule between weights, especially in those cases where criteria are rated as “slightly more important” or “slightly less important” and where one gets a weight of 0.75 and the other 0.25, is arbitrary. One may well choose to use another rule (e.g. 0.67 and 0.33). Yet, since the final average ratings do not show large differences between the five criteria, a different rule would probably not cause a dramatic difference.

It is also important to point out that:

- the final score for each question is to be calculated as the average of all the answers given by different evaluators;
- missing answers are to be excluded from the evaluation (the average is to be calculated based on the numbers of valid answers).



7. The online tools supporting the prioritization process

7.1 The EaP transport projects database

The EaP transport projects database supports the management of project information by contextualizing it according to territory and by providing a fast overview of nearby and/or correlating projects. By clicking on the link <http://trt.serverlet.com/EaP/> and entering the access credentials USER: eap PASSWORD: eap2016, a main page is accessed. This main page provides a list of all transport projects included in the database. The project list can be ordered or filtered by a set of attributes (e.g. country, mode, type, source). Each project is described in a form and (where possible) georeferenced on a map. On the left-hand side of the list, two icons (representing a globe or a form) are available.

Figure 1: EaP transport projects database. Main page

| MAP | FORM | CODE | COUNTRY | MODE | PROJECT | SOURCE | TYPE |
|-----|------|--------|------------|-------------|--|---|---------------------------|
| | | ARM_01 | Armenia | Road | North-South road corridor: section in the northern part of the corridor Yerevan to Bavra | Eastern Partnership Priority Projects (2013), EIB investment, TRACECA IDEA Priority Project (TIF 2010) | Upgrade |
| | | ARM_02 | Armenia | Road | Rehabilitation and improvement of the M6 Vanadzor - Alaverdi - Georgian border interstate road | Eastern Partnership Priority Projects (2013), TRACECA IDEA II, EIB investment | Upgrade |
| | | ARM_03 | Armenia | Road | Armenia Northern corridor modernisation project: upgrade of Bagratashen, Bavra and Gogevan border crossing points | EBRD investment, EIB investment | Upgrade |
| | | ARM_04 | Armenia | Inter-modal | International Logistics Centre (ILC) at Zvartnots international airport | LOGMOS Masterplan, TRACECA IDEA Priority Project (TIF 2012) | Upgrade, new construction |
| | | ARM_05 | Armenia | Road | Lifeline Road Network Improvement Project | WB investment | Upgrade |
| | | ARM_06 | Armenia | Road | North-South road corridor: section in the southern part of the corridor | Eastern Partnership Priority Projects (2013), TRACECA IDEA Priority Project (TIF 2010) | Upgrade |
| | | ARM_07 | Armenia | Road | Improvement of the M3 Turkish border - Margara - Vanadzor-Tashir - Georgian border road | Proposed Eastern Partnership Priority Projects (2016) | Upgrade |
| | | ARM_08 | Armenia | Road | Improvement of the M4 Yerevan - Sevan - Ijevan - Azerbaïjan border road | Proposed Eastern Partnership Priority Projects (2016) | Upgrade |
| | | ARM_09 | Armenia | Road | Improvement of the M8 Vanadzor - Dilijan road | Proposed Eastern Partnership Priority Projects (2016) | Upgrade |
| | | ARM_10 | Armenia | Road | Improvement of the M16 M4-Volkepar - Noyemberyan - M6 road | Proposed Eastern Partnership Priority Projects (2016) | Upgrade |
| | | AZR_01 | Azerbaijan | Rail | Upgrade of railway on the East - West corridor | Eastern Partnership Priority Projects (2013), TRACECA IDEA Priority Project (TIF 2012) | Upgrade |
| | | AZR_02 | Azerbaijan | Inter-modal | Construction of the International Transport Logistics Centre (ILC) in the New Baku International Maritime Trade port complex | Eastern Partnership Priority Projects (2013), LOGMOS Masterplan, TRACECA IDEA Priority Project (TIF 2010) | New construction |
| | | AZR_03 | Azerbaijan | Road | Roads reconstruction and upgrading project | EBRD investment | Upgrade |
| | | AZR_04 | Azerbaijan | Maritime | Improving existing trans-Caspian shipping links Baku Ahtau | LOGMOS Masterplan | Soft measure |

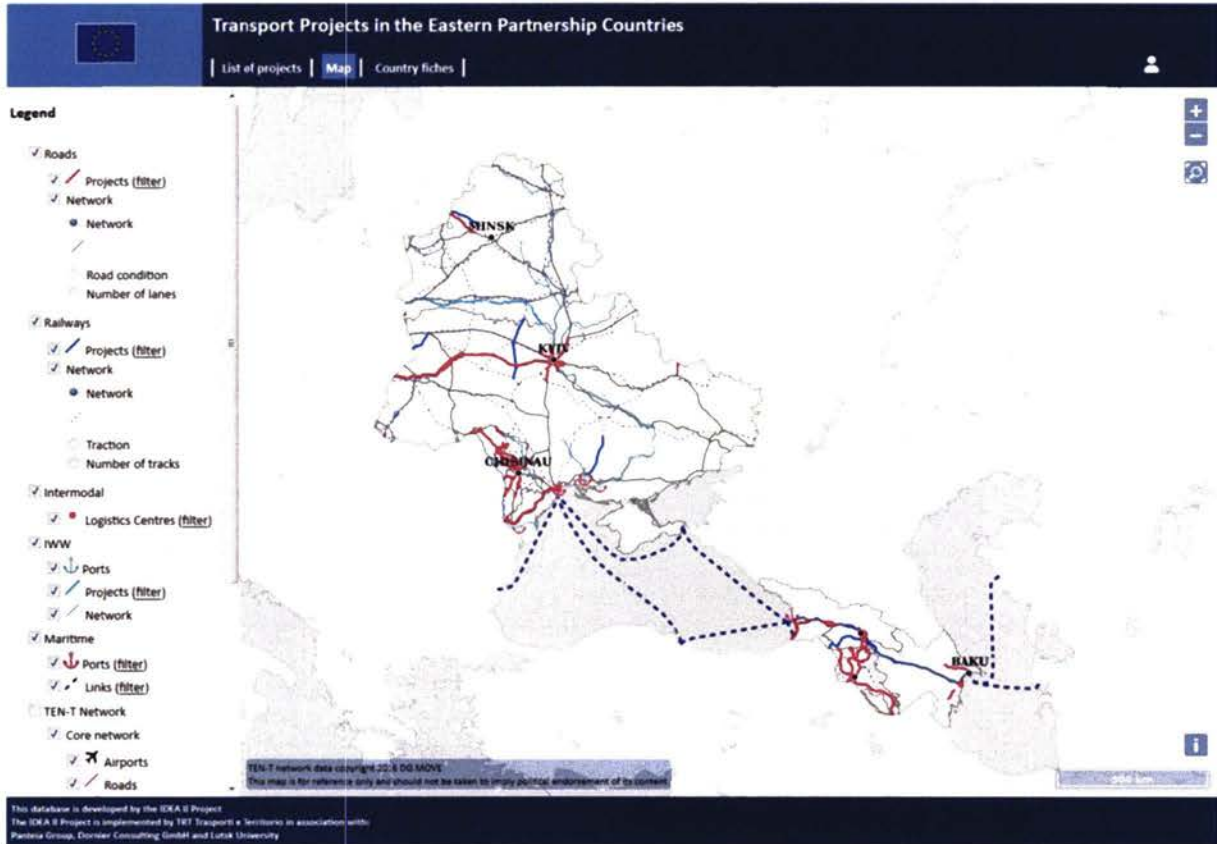
The **globe icon** in the first column of the table indicates that the project is georeferenced. By clicking on the globe, a map is displayed, which zooms to the selected project. The map is a dynamic map and can be easily navigated to enlarge the view and get a clear overview of the project location in the EaP region.

Other projects are visible and coloured according to the legend on the left-hand side of the map. Different layer groups are defined for the travel mode considered (roads, railways, inland waterways, maritime). Each group consists of the network layer and the projects layer, where appropriate. Single layers and group layers can be set to visible/invisible to better analyse the location of the infrastructures.



The shapefiles included in the database are based on those received from TENtec in November 2014 and further elaborated during the EaP regional transport study in the period November 2014 to June 2015.

Figure 2: EaP transport projects database. Overall map



The **form icon** in the second column of the main page provides access to the project fiche. The project fiche can also be opened by clicking on the project on the map. The project is described in terms of geographical, technical, economical and temporal aspects. If the project is georeferenced, a map is included in the geographical description field.



Figure 3: EaP transport projects database. Project fiche

North-South road corridor: section in the northern part of the corridor Yerevan to Bavra

| | |
|---------------------------------|--|
| Project code | ARM_01 |
| Source | Eastern Partnership Priority Projects (2013); EIB investment; TRACECA IDEA Priority Project (TIF 2010) |
| Sector | Road |
| Country | Armenia |
| Type | Upgrade |
| Geographical description | North-South Road Corridor crosses the territory of Armenia from the South to the North including Agarak-Kapan-Yerevan-Gyumri-Bavra highways and road infrastructures and is linked to the Georgian road network leading to Poti and Batumi ports. The whole Corridor runs 556 km from the border with Georgia at Bavra via Gyumri, Talin, Ashtarak, Yerevan, Gori, and Kapan, to the border with Iran at Meghri. The "North-South" road is part of the transnational motorway AH 82 interlinking Central Asian countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. |

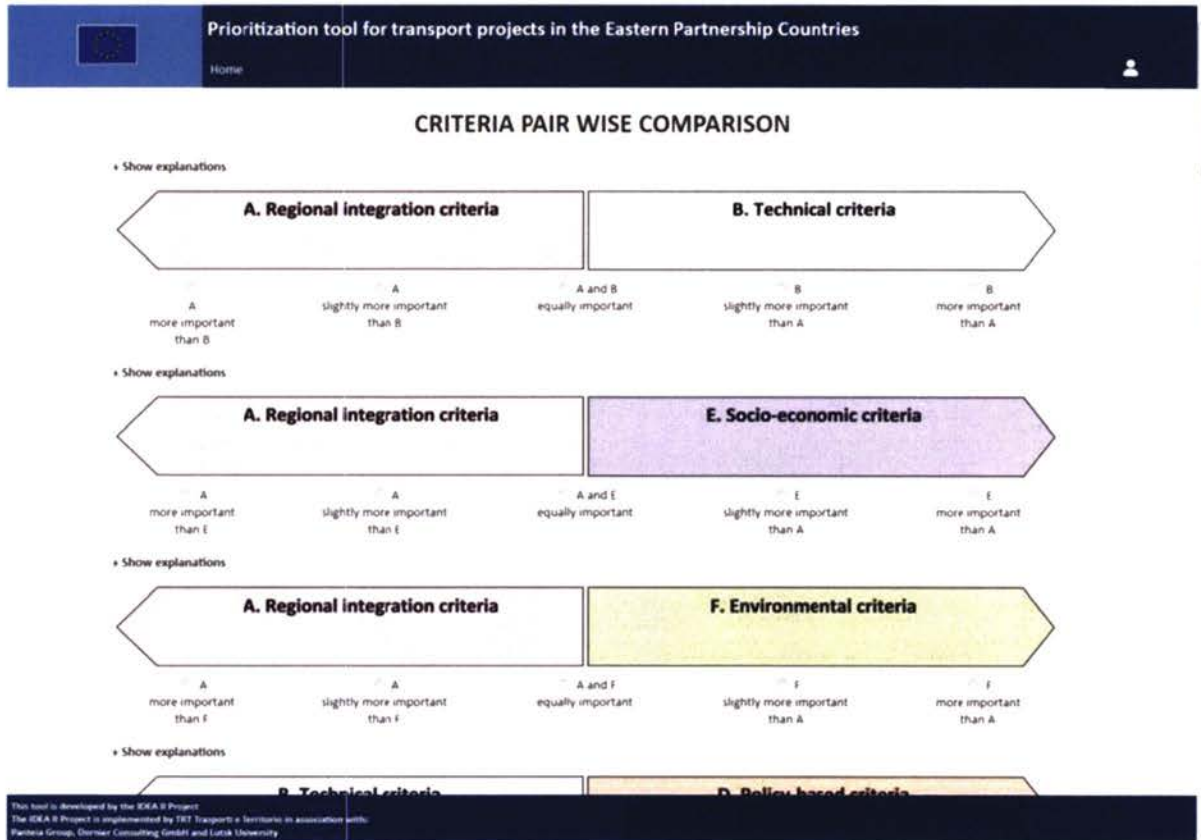
| | |
|--|--|
| Demand estimation from IDEA B-EaP transport model year 2030 | <ul style="list-style-type: none"> • Freight: 1.700 tonnes/day • Passengers: 2.200 cars/day |
| Technical description | <p>"North-South Road Corridor Investment Program" is subdivided into 6 separate tranches. The specific section Yerevan to Bavra encompasses:</p> <p>Tranche 1 (Artashat-Yerevan and Yerevan-Ashtarak) Total length 31 km</p> <p>Tranche 2 (Ashtarak - Talin) Total length 41.9 km where major works are:</p> <ul style="list-style-type: none"> • Widening of the existing 2-lane road up to 4-lane road from km29+600 to km71+500; • Reconstruction of 9 interchanges, 3 of which are overpasses and 6 are underpasses; • Construction of 14.1 km of new roads connecting to local roads in communities. |

7.2 The weighting tool

The prioritization tool allows projects to be assessed by different experts according to the five criteria; this can be done either by directly weighting each criterion or sub-criterion or by comparing each criterion to any other to establish the relative importance of the criteria, as illustrated in Section 6.



Figure 4: Online weighting tool for criteria pair-wise comparison



7.3 The projects prioritization tool

An online prioritization tool is developed to support a participatory approach of different actors in the prioritization exercise. The prioritization tool allows projects to be assessed by different stakeholders according to the five criteria.

The tool is accessible on the website by different users with individual access rights. Two groups of users are available:

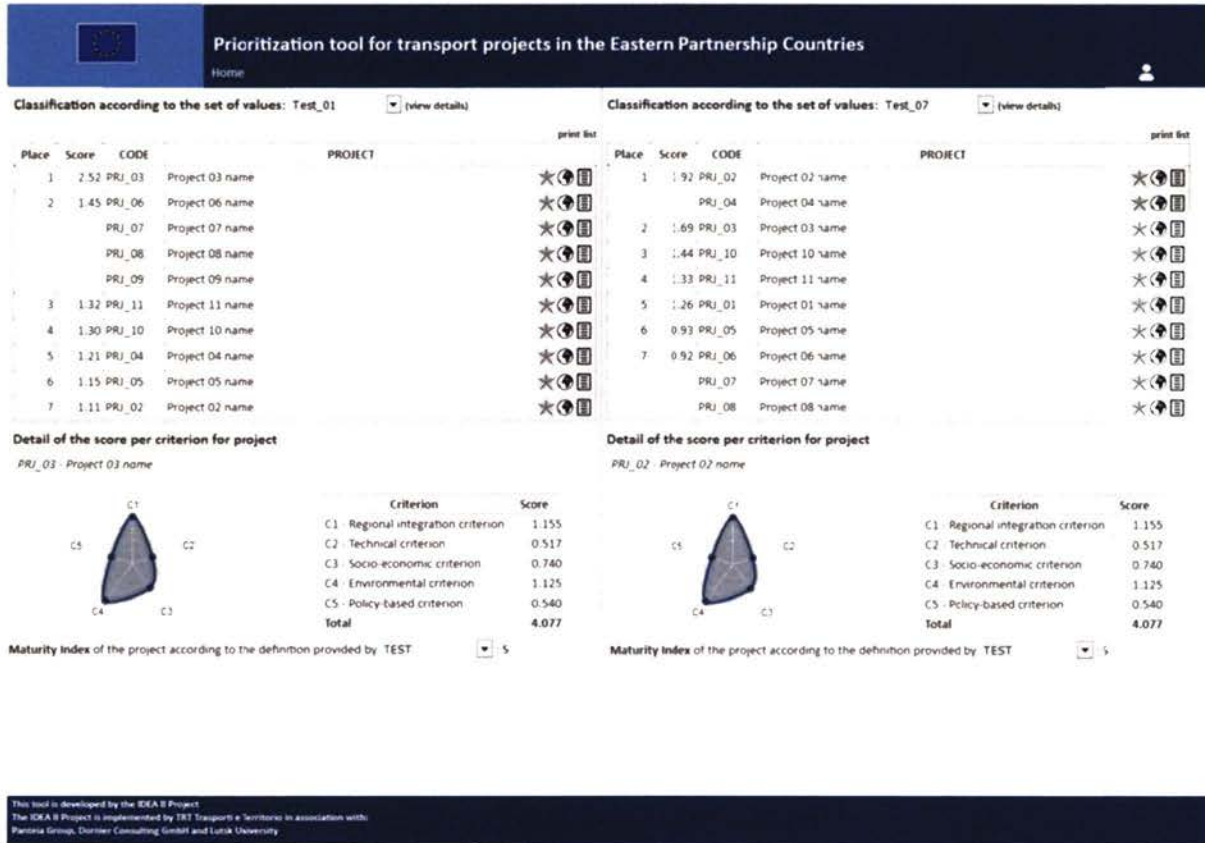
Power users, who have the possibility to select evaluation criteria and sub-criteria to be applied for the prioritization process. These users also have the possibility of choosing the weight of each criterion, the weights of sub-criteria within each criterion and the score to be assigned to the answers of each sub-criterion. Once defined, the user set of values is instantly applied to the projects under prioritization and their final ranking is displayed together with charts summarising project performance against the different evaluation criteria. The user has the possibility of defining and saving different sets of values and of comparing results between them.

Restricted users, who have the possibility of accessing the tool and of visualizing the ranking of projects achievable with a predefined set of values. They will be not allowed to modify the set of values.



This project is funded by the European Union


Figure 5: Online transport projects prioritization tool





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ANNEX 1 – PROJECT FACTSHEET

|  | Project Name |
|--|--------------|
| Project code | |
| Source | |
| Sector | |
| Country | |
| Type | |
| Geographical description | |
| Demand estimation from IDEA II-EaP transport model year 2030 | |
| Technical description | |
| Applicant/promoter/sponsor | |
| Investment amount | |
| Implementation schedule | |
| Status | |
| Expected impacts on <ul style="list-style-type: none"> • Transport • Environment • Social • Other | |
| Source of funding | |
| References | |

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