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METHODOLOGY FOR DETERMINING THE MOST EFFECTIVE SCENARIO FOR DEPLOYING A TRANSPORT CORRIDOR

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Introduction. Being a tool for ensuring trade and development, any modern transport corridor is a high-tech transport system that concentrates transport communications within a certain direction, providing passenger and freight traffic. The task of building international transport corridors (ITCs) is to concentrate the unhindered and cost-effective transportation of cargo and passenger flows along the routes with the enough throughput and a high level of development. The purpose of ITC is to accelerate cargo and passenger traffic, along with cost reduction due to scaling effect arising when a transport corridor includes several kinds of transport and telecommunications.

Formation of transport corridors is an important technological task that requires scientific substantiation of both design solutions and the potential economic efficiency of its subsequent operation. The need to simultaneously consider many indicators in the development of transport corridor projects determines the relevance of studying this issue, its scientific and practical value.

Literature review. The issues of evaluating the effectiveness of projects for the co-deployment of different types of infrastructures within the transport corridor are not new in the scientific literature. So, in works [2-4], the issues of co-deployment of different types of infrastructure are considered in the framework of solving this problem in different countries. In the works of G.V. Savitskaya. the methodological foundations for determining and assessing efficiency in terms of the impact of risks on entrepreneurial activity and its effectiveness have been determined [5]. The works of scientists [6] are devoted to an in-depth analysis of the effectiveness of the use of innovative telecommunication technologies in various spheres of economic activity. The issues of assessing the efficiency of transport systems, and corridors in particular, are studied in [7], where the development of a comprehensive rating assessment system was carried out, the relationships between the key parameters affecting the efficiency of transport corridors were revealed, and a mathematical apparatus was formed to assess their effectiveness. The work [8] examines the problems of assessing the efficiency of transport against the background of modern realities, including in the context of the digitalization of the economy and the socio-economic orientation of transport systems. In [9], the issues of the efficiency of the gas transportation system are investigated.

At the same time, most of the works are focused on assessing the effectiveness of a specific facility or process and do not consider the issues of determining the effectiveness of projects in the framework of scenario analysis of the deployment of a transport corridor.

Purpose. Based on the lack of scientific research in this direction, the aim of the article is to form scientific and methodological approaches to determining the most effective scenario for the design of a transport corridor in the context of the co-deployment of several infrastructure flows.

Methods. A generalized algorithm for determining the most suitable model for the development of new transport corridors is shown in Figure 1. As the initial data for the operation of this algorithm, in addition to the general characteristics of the transport corridor, information about existing infrastructure facilities, as well as information about promising economic and technological flows circulating in the territory of the transport corridor, is used. It should be noted that information about these flows can be either set directly (based on an in-depth analysis of the current macro- and meso-economic situation in the region of coverage), or calculated (determined) based on information about settlements, large industrial facilities and / or fields minerals located within the coverage area of the transport corridor.

Results. The first procedural step of the algorithm (Figure 1) is the procedure for determining the basic scenarios for the development of the transport corridor based on assessing the conformity of the state of existing infrastructure facilities to the characteristics of prospective economic and technological flows and determining the basic characteristics of new infrastructure facilities (if it's necessary to build them).

Under the scenario of the development of a transport corridor we mean a set of scenarios for the development of infrastructure facilities (highways/roads, railway lines, power lines, fiber-optic communication lines, etc.) existing or planned to be built in the coverage area of this transport corridor. Moreover, each scenario for the development of a particular infrastructure element can determine the need to build (create) this infrastructure element (in its absence), the need for its reconstruction (for example, to expand the capacity of the infrastructure facility) or the absence of the need for any of the actions (for example, if the existing the infrastructure object fully meets the specified needs). The key principle of this procedure is to identify only those development scenarios that fully satisfy the needs determined by the calculated or specified flows.

The principle of determining the development scenario for an existing infrastructure facility is based on the analysis of statements (whether the statement is true or not) for three features that determine both the state of the infrastructure object and its compliance with the needs of the corresponding technical and economic flow (for example, the compliance of an existing highway/road with the needs of a prospective freight traffic). Another sign that influences the choice of a scenario is the presence (or absence) of an alternative to this object.

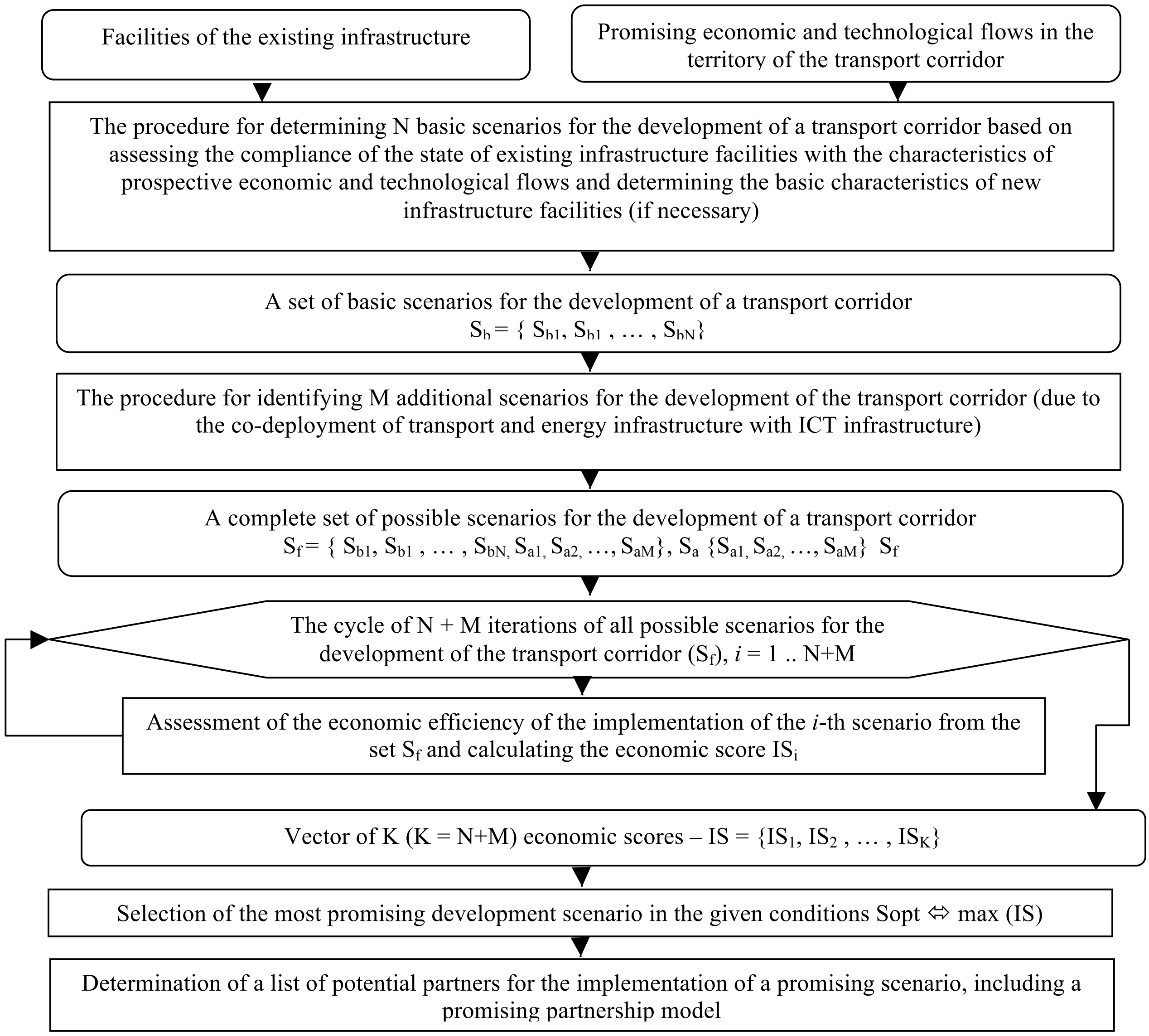

Fig. 1. Generalized algorithm for determining the most suitable model for the development of new transport corridors

Source: author's development

So, for example, the transportation of goods can be provided both by road and by rail. At the same time, it is advisable to accept for consideration and further economic assessment, for example, the option with the reconstruction of an existing facility and the option with the construction of a new alternative facility.

The next procedural step of the algorithm is the procedure for identifying additional scenarios for the development of the transport corridor due to the co-deployment of transport and energy infrastructure with ICT infrastructure. The key principle of this procedure is to combine the construction process of various types of infrastructure facilities in order to potentially reduce costs.

At the next step of the algorithms, a cyclical enumeration of all possible scenarios for the development of the transport corridor is carried out, applying to each of them the procedure for assessing the economic efficiency of its implementation by calculating a comprehensive economic assessment. The result of this cycle is a vector of economic assessments that reflects potential economic expectations from the entire set of scenarios selected for analysis. The final steps of the algorithm are the selection of the most promising (from an economic point of view) development scenario and determination of the list of potential partners for its implementation, including the formation of a promising partnership model.

The basis for determining promising economic and technological flows is the principle of assessing the demand for its appearance due to the presence in the coverage area of potential sources of the simplest flow elements (for passenger traffic – passengers, for freight traffic – cargo, for electric flow – electric power, and for information flow – information), as well as attraction between these sources on one side and potential utilizes (receivers / consumers) of the flow on the other side of the transport corridor.

To determine the appropriate intensities, it is necessary to study and assess the potential demand for certain elements of the flow. In this case, it is advisable to determine both the maximum and minimum demand. Information about the maximum flow will allow calculating the sufficient capacity of infrastructure facilities Information about the minimum flow is necessary to determine the optimal placement of infrastructure facilities, assess the feasibility of their creation (in the absence), recruiting personnel, etc. during periods of minimum load (to avoid downtime and / or unprofitable use of assets), as well as to resolve the issue of differentiation tariff policy (for example, in the case of charging a fare). In this case, the differentiation of tariffs (minimization during periods of minimum load and maximization – during periods of maximum) will smooth out unevenness by redistributing the load on the ITC.

For the convenience of calculations, we present the proposed methodology in the form of successive stages.

Stage 1. Determination of potential demand for existing flows, considering objective factors. These calculations are carried out based on the analysis of statistical information about the existing flows and their spatial and temporal characteristics. Taking into account the peculiarities of the provision of infrastructure services, the demand for them may fluctuate under the influence of objective factors, namely: time (depending on the season, rest regime, etc.), social factors (holidays, vacation campaigns, etc.) and other things. Therefore, it is necessary to determine the maximum and minimum possible load on the flow.

The potential maximum demand can be estimated using the following formula:

$$PD=[(UV_{н} \times QH)+(UV_{в} \times QB)] \times NUF_{max}, \quad (1)$$

where $UV_{н}$ – are the average volumes of use of services of a specific flow of households (in those units in which they are recorded by state statistics bodies, reduced to a conditionally natural indicator, for example, average consumption of kW of electricity by household consumers);

QH – the number of households in a given region (average for the period);

$UV_{в}$ – the average volumes of use of the services of a specific flow of business units, social facilities and local government entities for the services of the flow (in those units in which they are recorded by the state statistics authorities, reduced to a conditionally natural indicator, for example, the average consumption of kW of electricity for industrial purposes);

QB – number of business units, social facilities and local government entities;

NUF_{max} – coefficient taking into account the maximum flow concentration caused by uneven load (Non-uniformity factor). It can be calculated by the formula [10]:

$$NUF_{max} = К_{mcmax} \times К_{dcmax} \times К_{hcmax}, \tag{2}$$

where $К_{mcmax}$ – the highest concentration coefficient by months of the year;

$К_{dcmax}$ – concentration factor by days of the week;

$К_{hcmax}$ – the highest concentration factor by hours of the day.

As a result, we obtain the maximum possible flow taking into account the maximum possible load caused by unevenness. The potential minimum demand can be estimated using the following formula:

$$PD=[(UV_{н} \times QH) + (UV_{в} \times QB)] \times NUF_{min,} \tag{3}$$

where NUF_{min} – coefficient taking into account the minimum flow concentration caused by load unevenness (Non-uniformity factor).

If, for some reason, it is impossible to directly determine the flow (closed or incomplete information, lack of comparable reporting on the necessary parameters or in a regional context, etc.), it is necessary to use other methods. These can be:

– extrapolation of flows existing in this direction in monetary or physical terms to the projected flow, taking into account its features;

– analogy with a change in the volume of demand for services of a particular flow that arose on similar projects (comparable not only in terms of technical and economic, but also in terms of geopolitical characteristics);

– reverse evaluation, during which the critical values of project performance indicators are determined or set (minimum profitability, maximum payback period, etc.) and the reverse calculation method (using current tariffs for similar services in the region, existing discount rates, etc.) calculates the minimum permissible flow volume at which the project will be effective. In this case, if the flow values obtained in this way are a priori impossible (the calculated flow volume significantly exceeds the regional average consumption indicators for this type of service and there are no prerequisites for its increase by both internal and external consumers), it is advisable to abandon the design or develop another project.

Stage 2. Determination of the potential increase (reduction) of the flow occurring under the influence of subjective factors.

In this case, the influence of the conditions of the external contour of the ITC development (geopolitical, macroeconomic), as well as the features of the internal contour (social, climatic, etc.).

In this case, the determination of the increase (decrease) in potential traffic for this and other flows can be calculated based on the application of the methodological basis of the theory of expert assessments, namely the Delphi method. This method is based on the fact that a group of experts receives initial information about the existing traffic (in the form of volumes of a particular type of service in physical or monetary terms, obtained from official statistical sources), the level of development of the economy, tourism, infocommunications, energy and other aspects, directly or indirectly related to the functioning of this ITC.

An array of information is formed that reflects the individual assessments of experts regarding the preservation (increase, decrease) of the traffic of this stream under the conditions of the functioning of this ITC. Further, through an iterative procedure for discussing the results obtained and correcting estimates, an array of estimates is formed on the issue of maintaining (increasing, decreasing) traffic in the ITC flow.

It is advisable to present these estimates in the form of correction factors (*Cf*) to the existing volumes of traffic flow in this direction. Thus, if the expert believes that the traffic in the flow will remain at the same level, his coefficient is $Cf=1$. If the expert's opinion is reduced to traffic reduction, then $Cf<1$, if to increase, then $Cf>1$.

The correction factor (*Corf*), is determined similarly, reflecting possible traffic changes under the influence of the outer loop of the ITC. For example, the presence of several alternative routes can reduce ITC traffic, then $Corf < 1$. And the active development of intercountry cooperation, the permanent growth of import-export turnover and other factors testify in favor of $Corf > 1$.

Information received from experts in the form of coefficients Cf_i and $Corf_i$ for each specific ITC flow, are arranged in order from smallest to largest. We will consider as fair the coefficient that is the median among the obtained estimates Cf_i and $Corf_i$.

As a result, the calculation *Ti, Tj* or any other traffic flow is produced as follows:

$$Ti= PD \times Cf_i. \times Corf_i, \tag{4}$$

where *PD* – traffic volumes in a given direction (flow) from one point of the ITC to another along the existing alternative routes.

Stage 3. Determination of the adequacy (lack) of existing capacities to provide traffic to the ITC.

At this stage, the existing capacities of the corresponding types of flows are compared (*Eci*) with the needs for a given flow (*Nci*), defined in stage 2.

In the case when the involved (and reserve) capacities, according to their technical characteristics, can meet the flow needs ($Eci>Nci$), it is concluded that there is no need to deploy additional facilities. In case the characteristics of the existing facilities do not correspond to the potential flow ($Eci<Nci$), a conclusion is made about the need to deploy a new infrastructure facility.

Stage 4. Assessing the effectiveness of scenarios. All proposed scenarios for the development of ITC are different and may differ significantly among themselves not only in the volume of required investments, but also by other factors. That is, the maximum profitability of the i-th scenario can be accompanied by significant (in comparison with other scenarios) capital and operating costs and a significant payback period, thereby reducing the overall efficiency of the scenario and its attractiveness, in terms of forming partnerships for its implementation.

Based on the significant differences in the scenarios proposed for the development, it is advisable to analyze each scenario of the deployment of the ITC as a set of actions (reconstruction or new construction) over the infrastructure facilities (parts of the ITC), each of which has its own specifics: the initial state, features of the topology of the terrain, the participating countries.

In any case, the basis for the formation of performance assessments will be the size of capital investments and regular maintenance costs, which depend on the characteristics of technological processes for each infrastructure facility within a certain action. These costs will differ in composition due to differences in the filling of technological processes both for each infrastructure facility and for the type of action performed.

Based on this, it is advisable to separate the process of forming a base for determining efficiency (calculation of capital investments and regular expenses) and the methodology for determining efficiency separately for infrastructure facilities. Here is a general approach to the definition of capital investment and regular maintenance costs.

We will take as a basis the definition of capital investments for deployment for each i-th scenario (*Ki*) and regular maintenance costs of ITC (*ESi*) labor intensity of technological processes (*LIi*) and the cost of all consumables (*QMi*) for each separately taken infrastructure facility (taking into account the action that must be performed on this object in the framework of the corresponding scenario).

To determine the labor intensity for each infrastructure facility, it is necessary to form a list of its inherent technological processes. Each technological process, in turn, contains a certain set of technological segments – elements of technological processes.

These elements can be divided into conditionally scalable (having analogs and / or technological standards that can be the basis for calculating the labor intensity for the entire set of scalable segments within the infrastructure facility) and non-trivial (not having standardized technological processes with the corresponding labor intensity standards).

In the event that a technological segment can be characterized as conditionally scalable, that is, one for which there are standards and regulations, on the basis of which it is possible to determine the cost of deploying a unit by direct calculation (for example, laying 1 km of a route or 1 channel-kilometer of fiber-optic communication lines on a flat (or as close as possible to such) a site), then in this case, the calculation of capital and maintenance costs is reduced to the product of distance by the average (or standard) cost of a segment deployment unit (reconstruction, maintenance, etc.).

In the event that the technological segment is non-trivial and, for example, does not have known technical and economic characteristics (passing a mountain pass, laying a tunnel under water, etc.) due to the lack of analogues in the area, the calculation of capital costs and maintenance costs must be carried out based on the determination of the labor intensity of each technological process element by element or on the basis of typical templates for the most similar processes. The labor intensity of these segments can be determined based on the standards or norms of labor costs for a certain type of work (if any) or by timing the working time or by expert assessments with the subsequent determination of the average labor intensity of the processes of the same name along the entire length of the infrastructure facility.

The complexity of the processes (primarily element-by-element) can be adjusted for coefficients, considering various factors, namely:

K_{cc} – coefficient of accounting for the complexity of processes (complex topography of the area, natural and climatic conditions, etc.);

K_{rd} – coefficient of the possibility of using standard technical solutions (for example, the use of ready-made software modules or technical designs).

Let's reflect the process of formation of capital investments and regular maintenance costs for each technology segment in Figures 2-4.

Thus, the total amount of capital investment (K) for a deployment is the sum of similar metrics for scalable and trivial items. Total maintenance costs (*ESi*) - the sum of similar indicators for scalable and trivial items. Total maintenance costs - the sum of similar indicators for scalable and trivial items.

It is necessary to consider the discounting processes by determining the sum of the factors (discount factor, *gt*) that have the greatest impact on each i-th scenario of the ITC. The most significant factors include the dynamics of inflation *DI*, the refinancing rate of the national bank of the country or international financial institutions *RR* (in the case of attracting credit funds for the deployment of ITC), the level of risk *RL*, etc.

It should be noted that these factors can be different for different scenarios (especially in terms of accounting for the risk factor). Thus, the numerical value of the discount factors can be determined separately for each scenario based on the statistical indicators for each factor (in unit fractions or percentages).

The total sum of these indicators for each *i*-th scenario makes it possible to determine the comparative effectiveness of each of them. The most effective in this case is understood as a scenario that meets the conditions:

$$\text{NPVi (net present value)} \rightarrow \max \text{ (for all NPVi} > 0\text{)},$$
$$\text{ISi (rate of specific growth rate index)} \rightarrow \max$$

Note that it is proposed to take not only maximum IS value as a criterion for evaluating the obtained calculation results for a flow, but also the result obtained during the calculation of this index (IS^c) for similar flows in the whole country (in which it is planned to deploy ITC, or the average index for participating countries). Thus, $ISi > IS^c$.

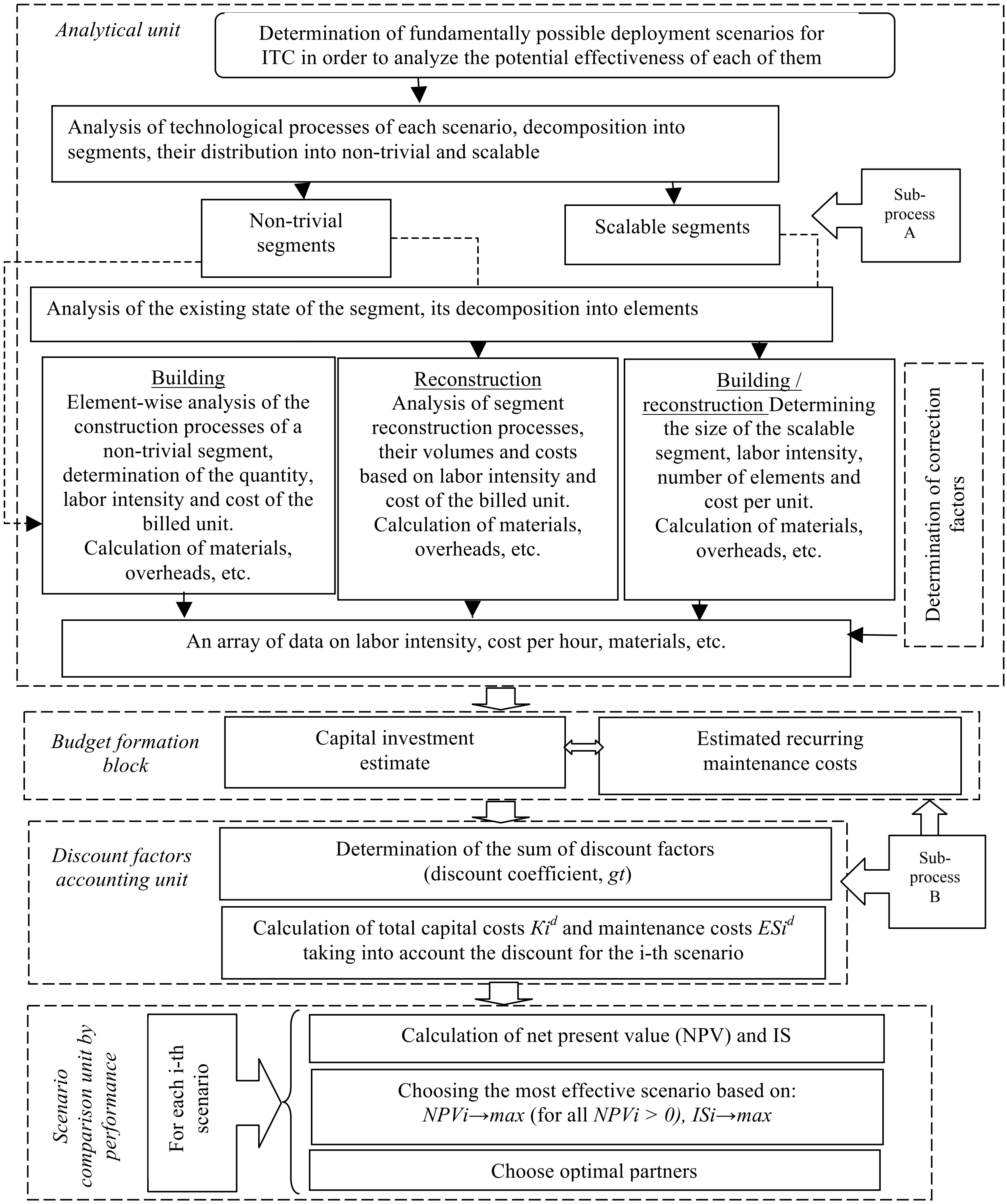

Fig. 2. Capital investment and recurring costs budgeting process

Source: author's development

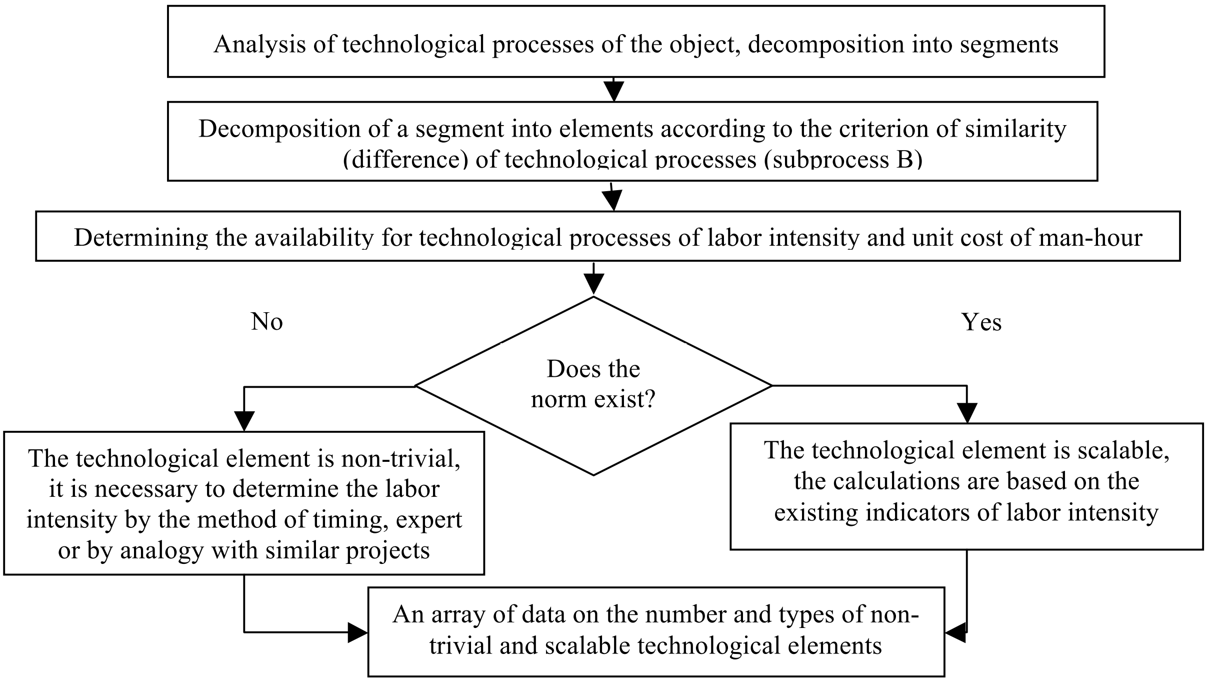

Fig. 3. Sub-process A - analysis of technological elements by the criterion of triviality or scalability

Source: author's development

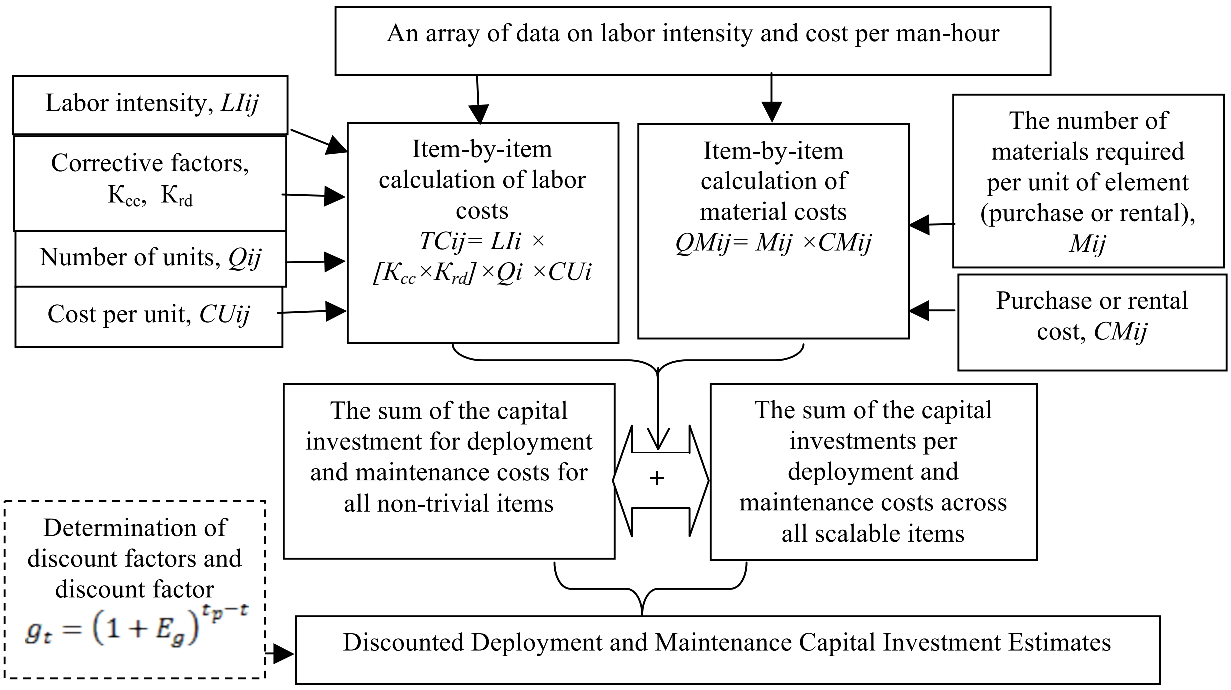

Fig. 4. Sub-process B - analysis of technological elements by the criterion of triviality or scalability

Source: author's development

In this case, the project is recognized as cost-effective if the estimated IS of the project is higher than the IS^c indicator obtained at the macroeconomic level. This is since the investments attracted to the project should be more profitable than state capital investments.

Let's test the proposed approach using the example of ITC Almaty (Kazakhstan) - Cholpon-Ata (Kyrgyzstan). This corridor is designed as an alternative to the existing one between these localities and is mainly focused on the transportation of tourists to Lake Issyk-Kul. The advantage of the project is a significant (from 450 km to 70.5 km) reduction in the length of the route and, consequently, the time and cost of transportation. It is planned, within the framework of this ITC, to make co-deployment of road (or railways), as well as power transmission lines and fiber-optic communication lines.

Analysis of a potential survey for flow services (using the example of road transport services) showed that useful flows on the Almaty – Cholpon-Ata section currently use a 450 km route through Bishkek. Annually, tourist passenger flows are (according to statistics) about 0.9 million passengers. According to experts, the direct route with a length of 70.5 km (part of which falls on a tunnel in a mountain range) can increase in passenger and cargo traffic by reducing the time, and can increase the flow of tourists by 60% [12].

Transportation costs will be cut up to $ 45-50. With an increase in demand by 60% (according to experts' estimates) to 1.44 million passengers, the total profitability from passenger traffic is 64.8-72 million USD. Thus, we get the expected annual flow in natural (1.44 million passengers) and cash (64.8-72 million USD) terms. These indicators are adjusted considering the above-described load unevenness factors (NUF_{max}) and the effects of internal and external factors (C_f and C_{orf}). The volumes of other flows are calculated in a similar way.

Determination of labor intensity, capital costs and current maintenance costs for all possible scenarios of the project development showed that the costs of the project in comparison with the expected revenues will lead to an inadequately long payback period (more than 50 years, calculations made by using https: //broadband.shinyapps.io/Smart Corridors Simulator). The volume of investments obtained during the calculations for the deployment of this project is comparable to the costs of the construction of the Eurotunnel under the English Channel, connecting the UK and continental Europe. Capital expenditures for this project amounted (according to various estimates) to about 10 billion British pounds (14 billion USD) [13]. Financing of the construction was carried out mainly by private capital with the support of the member states. Opened in 1994, only in 2007 it began to make a profit, passenger traffic reached 19 million people. With a trip cost of about 150 euros, the payback period of the project under such conditions is several hundred years. That is, today we cannot talk about its economic efficiency of the Eurotunnel, however, there is social, geopolitical, socio-cultural and other types of efficiency.

Similar conclusions can be drawn from the results of calculations for ITC Almaty (Kazakhstan) – Cholpon-Ata (Kyrgyzstan). The implementation of the project under the given conditions can have the following options:

– complete rejection of the project in this design option;

– finding investors and potential partners directly interested in this project, not only as a tourist corridor, since tourist and other present flows are not able to generate cash flows necessary to ensure an acceptable payback period;

– deployment of the project as initially social. In this case, the bulk of the investment will have to be undertaken by the participating countries or foreign funds. Here, in terms of financial performance, the co-deployment railway (or road) with IT and separate building electricity scenario is optimal. The optimality of this scenario is confirmed by the fact that both road (99.8% of passenger traffic [14]) and rail (94.6% of cargo [15]) are priority in this region. However, given the fact that the purpose of this ITC is primarily tourist, it is co-deployment road with IT and separate building electricity that can be considered optimal;

– continuation of design research in order to find a less expensive option for solving the issue while simultaneously searching for interested partners.

In addition to economic efficiency (determined on the basis of the calculation of capital investments, current annual maintenance costs, etc.), other types of efficiency can be taken into consideration, namely:

– social and geopolitical, associated with the formation of conditions for providing the population and / or business structures with the services of the ITC;

– ecological, due to the minimization of harmful effects on the environment during the deployment and subsequent operation of the ITC.

Conclusions. This paper proposes an approach to determining the most effective scenario for the deployment of a transport corridor based on the application of a scenario approach with a subsequent assessment of each scenario.

In further studies, it is planned to form a scientific and methodological approach to the formation of an optimal model of partnership interaction during the implementation of the most effective ITC scenario with the identification of the main benefits for each of the partners.

Acknowledgements. The method has been validated in a study of UN Economic and Social Commission for Asia and the Pacific (ESCAP) on the development of smart transport corridors.

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РЕФЕРАТИ ABSTRACTS

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Каптур В.А., Князєва О.А. МЕТОДИКА ВИЗНАЧЕННЯ НАЙБІЛЬШ ЕФЕКТИВНОГО СЦЕНАРІЮ РОЗГОРТАННЯ ТРАНСПОРТНОГО КОРИДОРУ

Анотація. В умовах поглиблення інтеграційних процесів провідна роль належить формуванню міжнародних транспортних коридорів (МТК), розвиток яких зіштовхується з необхідністю визначення його потенційної ефективності. Більшість наукових розробок не розглядають питання визначення ефективності спільного розгортання декількох інфраструктур у межах сценарного аналізу проєктів МТК. ***Метою*** роботи є формування науково-методичного підходу до визначення найбільш ефективного сценарію проєктування транспортного коридору в контексті спільного розгортання декількох інфраструктурних потоків. ***Методики дослідження.*** Інформаційною базою обрано міжнародні нормативні акти, статистична інформація та директиви ООН. Застосовано низку методів наукового пізнання, зокрема теоретичного узагальнення, емпіричного аналізу, порівняння, прогнозування тощо. ***Результати***. Розроблено узагальнений алгоритм визначення найбільш оптимальної моделі розвитку МТК. Запропоновано методику визначення перспективних інфраструктурних потоків, яка заснована на оцінці попиту та враховуюча нерівномірність навантаження, вплив внутрішнього і зовнішнього контурів, інші чинники. Розроблено підхід до визначення капітальних інвестицій і видатків на обслуговування на підставі розподілу технологічних процесів на нетривіальні і масштабовані. В якості критеріїв ефективності запропоновано використовувати показники чистого грошового потоку та індексу швидкості питомого приросту вартості. Проведено апробацію пропонованого підходу на прикладі МТК Алмати (Республіка Казахстан) – Чолпон-Ата (Киргизька Республіка) та встановлено, що проєкт за існуючих потоків неефективний і вимагає іншого проєктного рішення або істотного збільшення потоків. ***Науковою новизною*** є вдосконалення методів оцінки проєктних рішень при проєктуванні МТК з точки зору визначення потенційних потоків кожного з можливих сценаріїв (шляхом прямого розрахунку, екстраполяції або зворотного методу) з подальшим розрахунком потенціалу ефективність кожного. ***Практична значимість***. Пропонований підхід, що базується на сценарному аналізі, дозволяє визначити найбільш ефективний сценарій розгортання транспортного коридору.

Ключові слова: міжнародний транспортний коридор, потоки, сценарій, ефективність.

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Kaptur V., Kniazieva O. METHODOLOGY FOR DETERMINING THE MOST EFFECTIVE SCENARIO FOR DEPLOYING A TRANSPORT CORRIDOR

Summary. In the context of deepening integration processes, the leading role belongs to the formation of international transport corridors (ITC), the development of which is faced with the need to determine its potential efficiency. Most scientific developments do not consider the issues of determining the effectiveness of the co-deployment of several infrastructures in the framework of the scenario analysis of ITC projects. ***The purpose*** of the work is to form scientific and methodological approaches to determining the most effective scenario for the design of a transport corridor in the context of the co-deployment of several infrastructure flows. ***Research methods.*** The information base includes international regulations, statistical information and UN directives. Several ***methodology of research*** of scientific cognition have been applied, theoretical generalization, empirical analysis, comparison, forecasting, etc. ***Findings.*** A generalized algorithm for determining the most appropriate model for the development of ITC has been developed. A method is proposed for determining promising infrastructure flows, based on an assessment of demand and considering the unevenness of the load, the influence of the internal and external contours. An approach has been developed to determine capital investments and maintenance (operational) costs based on the division of technological processes into non-trivial and scalable. It is proposed to use indicators of net present value (NPV) and an index of the rate of specific growth in value (IS) as criteria for efficiency. The proposed approach was tested on the example of ITC Almaty (Kazakhstan) – Cholpon-Ata (Kyrgyzstan), which showed that the project with the existing flows is ineffective and requires a different design solution or a significant increase in flows. ***Originality.*** The improvement of methods for evaluating design solutions in the design of ITC in terms of determining the potential flows of each of the possible scenarios (by direct calculation, extrapolation or reverse method) with the subsequent calculation of the potential efficiency of each. ***Practical value.*** Offered approach to determining the most effective scenario for the deployment of a transport corridor based on the application of a scenario approach with a subsequent assessment of each scenario.

Key words: international transport corridor, flows, scenario, efficiency.

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