Ministry of Public Finance
Authority for Coordination of Structural Instruments (ACIS)

Improving the system of indicators used in monitoring and evaluation

Activity 1.1 Analysis of the system of indicators used in monitoring and evaluation

SOP - Transport

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1. NEEDS ASSESSMENT

The "Needs assessment questionnaire" distributed to SOP Transport stakeholders was completed by four experts of the SOP Transport Managing Authority[1], from different departments. Although they cannot be considered representative in number, the opinions expressed by them provide a good insight into the main features, weaknesses and debates around the OP Transport system of indicators.

As presented in the Methodology chapter, stakeholder views are deliberately reported as received. The chapter does not comment on their accuracy, validity or feasibility. However, it does provide preliminary conclusions (in text boxes) as "consultants' perspective" on the views of the stakeholders.

Findings are presented in two sub-sections: (1) general design of the indicators system of OP Transport, which includes observations for individual indicators and (2) institutional set-up, including references to resources, SMIS usage and communication.

Together with the outcomes of the analysis exercise, presented in the next chapters, the stakeholders' views provided the foundations for the conclusions and recommendations for improving the system of indicators of OP Transport.

1.1. GENERAL DESIGN OF THE INDICATORS SYSTEM

Responses to the survey show that, generally, SOP-Transport indicators system is considered relevant both at PA level and for the overall Programme. However, respondents also stated that it is still too early to assess these aspects in practice, since working with indicators began only recently.

In terms of appropriateness of the individual indicators, some respondents question the validity of the targets established for result and impact indicators, particularly in the context of the recent economic crisis, since initial conditions have fundamentally changed and consequently the performance of the programme was negatively influenced. In this respect, *increase of GDP* and *Value for time savings in Euro / year for transported passengers and freight stemming from new and reconstructed roads* were given as examples (see answers to Q2.3). These comments are of course not related to the quality or suitability of the actual indicators, in relation to which no observations have been made. Consequently, no suggestions for modifying the existing indicators were provided by the respondents.

The only observations made regarding individual indicators at programme level refer to the Technical Assistance PA, for which one respondent noted the absence of qualitative indicators that can monitor/assess the quality and the results of training (see answers to Q2.4).

In relation to the EU core indicators, there was a general understanding that initially they were not included into the OP but were added later, as supplementary indicators, after consultations between SOP-Transport MA and ACIS. In what concerns the outcome of this exercise, responses differ slightly: while some suggested that a revised list be drawn up and be sent to the EC, for approval (see answers to Q2.4), others considered that all EU requirements are met and the common core indicators are fully integrated into the OP (see answers to Q2.7). All respondents agree that there are no difficulties in integrating common core indicators (see answers to Q2.10).

[1] See Annex A for the questionnaire template and list of respondents

Regarding the balance between the different types of indicators, the answers suggest that the issue was not fully understood by the respondents, hence the answers are inconclusive (see answers to Q2.5).

In contrast to programme level indicators, some stakeholders noted some difficulties in employing project level indicators, stemming from the particular nature of these indicators and related partially to the use of SMIS for their monitoring. Also, in some cases, there is no clear differentiation between project and programme indicators (see answers to Q2.2).

Preliminary conclusions

a) *Starting from the opinions expressed by MA level stakeholders, in the case of SOP-Transport, there is an overall lack of awareness and practice in respect to using indicators. It also seems that the late start and problems related to the slow progress of the implementation have diverted the MA from attaching more priority to improving the management of the SOP-T indicators;*

b) *In respect to the opinions received related to the individual indicators, there is a need for having a definitive list agreed with the EC, as well as with a common approach for indicators used across OPs (such as TA indicators), coordinated by ACIS in close cooperation with the SOP-T MA;*

c) *As regards the suggested need for a balance between quantitative and qualitative indicators, there is a need to select and test each individual indicator through a multi-criteria analysis, that will take into account both the need to have a complete and accurate image of the progress of the implementation (relevance, sensitivity) and the need not to add too much costs and administrative burden (cost, availability). Such analysis will be thoroughly presented in Section 3 and its related Annex II of this document.*

d) *Given the lack of clear understanding of the relationship between project and programme level indicators, as well as between the different types of indicators, there is an obvious need for training and instructions/ procedures specifically designed for working with indicators. Specifically, additional training and consultation related to SMIS use is a valid need, confirmed by the respondents;*

1.2. INSTITUTIONAL SET-UP

Respondents to the survey acknowledged the fact that there are no specific procedures with respect to indicators. In practice the responsibilities for elaborating the indicators system for SOP-Transport were fulfilled by the Programming Directorate. Other functions, such as collecting, processing or reporting are described in the wider relevant MA and beneficiaries' procedures.

In terms of the most important needs or deficiencies affecting the work with SOP-T indicators, respondents referred to elaborating the procedures for collecting, monitoring and reporting indicators, as well as to establishing the indicators targets[2]. There were also respondents that noted no deficiencies affecting their activity in relation to indicators.

As regards inter-institutional communication, respondents consider it good but difficult, especially at project level. One example referred to the difficulty of correlating similar projects developed by different beneficiaries, so as to ensure complementarity of results and

[2] Idem

to avoid duplication (see answers to Q3.5). No deficiencies were identified in internal communication, among the different departments of the SOP Transport MA.

In respect to SMIS functioning, all observations refer to project monitoring and are related mainly to granting additional rights to monitoring officers, removing "discrete physical parts" from the system, and allowing for all project indicators to be introduced (see answers to Q3.8).

In respect to the availability of resources, the most important deficiencies noted by respondents refer to insufficient personnel and current budgetary restrictions. Training, guidelines and instructions are also considered necessary, so as to improve working with indicators, since, until the time of the survey, only one training project had been developed (see answers to Q4.5).

The priorities identified by the respondents refer to (see answers to Q5.1 and Q5.2):

- Ensuring further simplification and flexibility to the system of indicators;
- Defining indicators, so as to ensure a common understanding for all stakeholders;
- Establishing a common set of indicators, by combining OP indicators and supplementary indicators.

Preliminary conclusions

a) *The survey has indicated the need for procedures dedicated to working with indicators. An implicit modus-operandi is currently functioning and the activities related to collecting, measuring, processing and monitoring of indicators are partially covered by other procedures. Nonetheless, this omission perpetrates a vague allocation of responsibilities.*

b) *In terms of effective communication among the different stakeholders, this is paramount for ensuring not only a proper functioning of the institutions but also a successful implementation of the OP. Ensuring correlation among the different projects and avoiding overlaps should be a priority, even more in the case of big investments and large infrastructure projects;*

c) *As for other OPs, the issue of resources needs to be considered both in terms of available staff with adequate competency to manage indicators and related to their respective financial compensation, which should provide a minimum level of professional motivation;*

d) *Designing an indicator system "as complex as necessary and as small as possible under the specific circumstances of a specific programme"[3] is certainly a challenge. In order for this to be achieved, the system must be sufficiently flexible to accommodate user feedback, as well as policy and programming changes. As implementation will progress, more knowledge will be achieved, on all tiers – performance, capacity of beneficiaries, and appropriateness of indicators. The feedback provided by the use of indicator systems should be used for continuous improvement both in terms of policy but also in terms of the indicator system itself;*

e) *At this stage, there are at least two reasons that call for an assessment and possibly revision of the existing system: the recent addition of supplementary indicators and the need for correlation with other OPs (ROP and OPTA, for example), for cross-cutting indicators, such as "number of participants", "length of road" etc.*

[3]DG Regional Development, Indicative Guidelines on Evaluation Methods: Monitoring and Evaluating Indicators, Working Document No. 2, Aug. 2006, p.21

2. ANALYSIS OF THE INDICATORS SYSTEM

2.1. COVERAGE OF THE INDICATORS SYSTEM

2.1.1. SOCIO-ECONOMIC ENVIRONMENT

The main purpose of context indicators is to provide information on the current socio-economic environment in which the programme activities are carried out, in the case of SOP Transport to provide information on the situation in the transport sector.

The context indicators were in the programming phase used for the analysis of the situation in terms of strengths and weaknesses in order to identify and quantify the needs of the sector. In the implementation phase they are relevant in order to monitor the overall development in relevant areas of the sector.

In the SOP T a list of context indicators was not provided, but several potential transport specific context indicators could be identified through the screening exercise carried out by us at the level of the socio-economic analysis and SWOT in the programming document. We noticed that the analysis of the current situation within the SOP-T was based on the most significant trends occurred in the transport sector, reflected by several macro-economic indicators.

We found that SOP-Transport contain a relatively accurate overview of the needs related to the development of the transport sector in Romania. In relation to indicators, one major set-back was the fact that no comprehensive database in the field of transport was available at that stage. In fact, one of the recommendations of the ex-ante evaluation was that "appropriate mechanisms should be set-up, so as to enable the collection of data from transport operators, through studies and surveys".

Thus, we may draw certain ***preliminary conclusions*** as follows***:***

- Currently the monitoring system of the SOP Transport in Romania does not include formally any context indicators. This situation does not allow proper contextualisation of the programme interventions;
- The absence of context indicators limits the possibility for a continuous check on the relevance of identified needs and on the implementation of interventions financed from the OP;
- Strategic reporting at the programme level (annual implementation reports) is missing an important source of useful information.

Therefore, it would be advisable to consider ***the formal inclusion in the monitoring system of a number of context indicators*** reflecting the identified thematic fields addressed by the programme.

The analysis of the current situation described in SOP-T offered us a clear view on the most important sectoral context indicators and their history.

In addition, a number of transport-related OPs from other EU Member States were analysed[4], to check for international good practice. Thus, the international benchmark analysis revealed that context indicators were defined in the transport operational programmes for the Czech Republic, Lithuania, Slovakia and Spain[5]. As a result, the identified context indicators used by other MS were mapped against the five main themes (fields) targeted by the SOP-T in

[4] OPs in full text were consulted for the following MS: Bulgaria, Czech Republic, Hungary, Slovakia, Estonia, Lithuania, Latvia, Spain, Protugal (2007-2013) and Ireland (2000-2006);
[5] A more detailed presentation of each OP consulted is found in the Annexes.

Romania in the comparative table presented in the following pages (Figure 1). Context indicators revealed by the international benchmarking analysis to be relevant for the Romanian SOP Transport/strategic objectives were taken into account.

Finally, the following important references were considered in determining the proposed list of potential context indicators:

a) SWOT analysis; all four sub-sections (strengths, opportunities, weaknesses and threats) offer a series of the issues that have to be maximised or, on the contrary, alleviated, as well as of the ones that have to be taken into account or risk prevented;

b) the objectives and results of the "Action Plan for the implementation of the Strategy for Sustainable Transport for 2007 – 2013 and 2020, 2030" (AP), as they reflect the entire intervention on transport at national level; SOP Transport is one of the programmes that leads to the achievement of targets (strategic objectives) established in the national strategy; these targets should also be reflected by relevant context indicators within the SOP Transport and measured as such.

Furthermore, the availability of the proposed indicators from official statistical sources was considered (e.g. National Institute of Statistics, Ministry of Transport database, Romanian Police)

As a result, the Figure 2 encompasses the context indicators that were considered relevant for the SOP-T implementation.

FIG. 1 BENCHMARK OF CONTEXT INDICATORS

Fields targeted by the SOP Transport	Potential context indicators resulting from the SOP-T analysis	Context indicators targeted by the SOP T – Czech Republic	Context indicators targeted by the SOP CF-ERDF Spain	Context indicators targeted by the SOP T – Slovakia	Context indicators targeted by the SOP EG – Lithuania
1. <u>Road transport</u> covers issues like road network, road and highway construction/ rehabilitation, road maintenance, road freight traffic, road safety, road infrastructure, road safety	- Annual average daily road traffic - Road freight traffic - Km of constructed roads and motorways - Road traffic accidents	- Overall decrease of the accident rate in the CR - Number of regions (NUTS III) not connected to a quality TEN-T road transport network	- Total Km of roads /1000 inhabitants - Total Km of roads / 1000 sq.km - Total Km of highways and highways / 1000 sq.km - Total Km of highways and highways / 1000 inhabitants - Endowment of high capacity roads - Resident population within 30 km of a high capacity road - Provincial capitals with direct access to high-capacity road network - Execution degree of the road transportation mode in the ITSP - No fatalities in accidents/10.000 Inhabitants-year - No of accidents with victims/10.000 inhabitants-year - Share of road over the interior transportation of goods - Travellers on regular urban transportation - Share of private car over the passengers transportation on land	- Density of higher class roads – highways and expressways - Number of fatalities in consequence of traffic accident in road transport	***No context indicators established***

Fields targeted by the SOP Transport	Potential context indicators resulting from the SOP-T analysis	Context indicators targeted by the SOP T – Czech Republic	Context indicators targeted by the SOP CF-ERDF Spain	Context indicators targeted by the SOP T – Slovakia	Context indicators targeted by the SOP EG – Lithuania
1. <u>Rail transport</u> covers issues like rail infrastructure, railway infrastructure maintenance, railway operations, rail freight transport, railway stations, railway restructuring and modernisation	- Rail passenger transport - Rail freight transport - Railway transportation market share	- Number of regions (NUTS III) not connected to a quality TEN-T railway transport network	- Total Km railway lines/1000 sq.km - Total Km railway lines/ 1000 inhabitants - Number of passengers on high speed lines - Execution degree of rail transportation mode in the Infrastructure and Transport Strategic Plan (ITSP) - Resident population within 50 km of a high-speed station - Provincial capitals with direct access to high-speed rail network	- Share of railway transport on freight transport performance - Share of railway transport on passenger transport performance	- Increase in volumes of cargo carriage by rail
2. <u>Air transport</u> covers issues like air traffic, main airports, investment priorities	- Air passenger traffic - Air freight traffic - Passengers air traffic growth - Freight air traffic growth	***No context indicators established***	- Airport passengers per capita - Capacity of airport system - Annual operations in airports - Execution degree of the airport transportation mode in the ITSP	***No context indicators established***	- Increase in passenger flow at airports

Fields targeted by the SOP Transport	Potential context indicators resulting from the SOP-T analysis	Context indicators targeted by the SOP T – Czech Republic	Context indicators targeted by the SOP CF-ERDF Spain	Context indicators targeted by the SOP T – Slovakia	Context indicators targeted by the SOP EG – Lithuania
3. <u>Waterborne transport</u> covers issues like seaports, inland waterways, maintenance, inland waterway traffic	- Inland waterway freight transport - Traffic in ports of passengers and freight	***No context indicators established***	- Ships traffic in ports (cabotage and external) in tons related to the population - Participation of maritime mode - Capacity of port system - Execution degree of the port transportation mode in the ITSP	***No context indicators established***	- Increase in Ro-Ro cargo flow in Klaipėda seaport
4. <u>Intermodal and combined transport</u> covers issues like intermodal freight terminals, intermodal infrastructure	- Passengers traffic performance and modal share - Freight traffic performance and modal share	***No context indicators established***	***No context indicators established***	***No context indicators established***	***No context indicators established***

FIG. 2 **PROPOSED LIST OF CONTEXT INDICATORS FOR SOP-T**

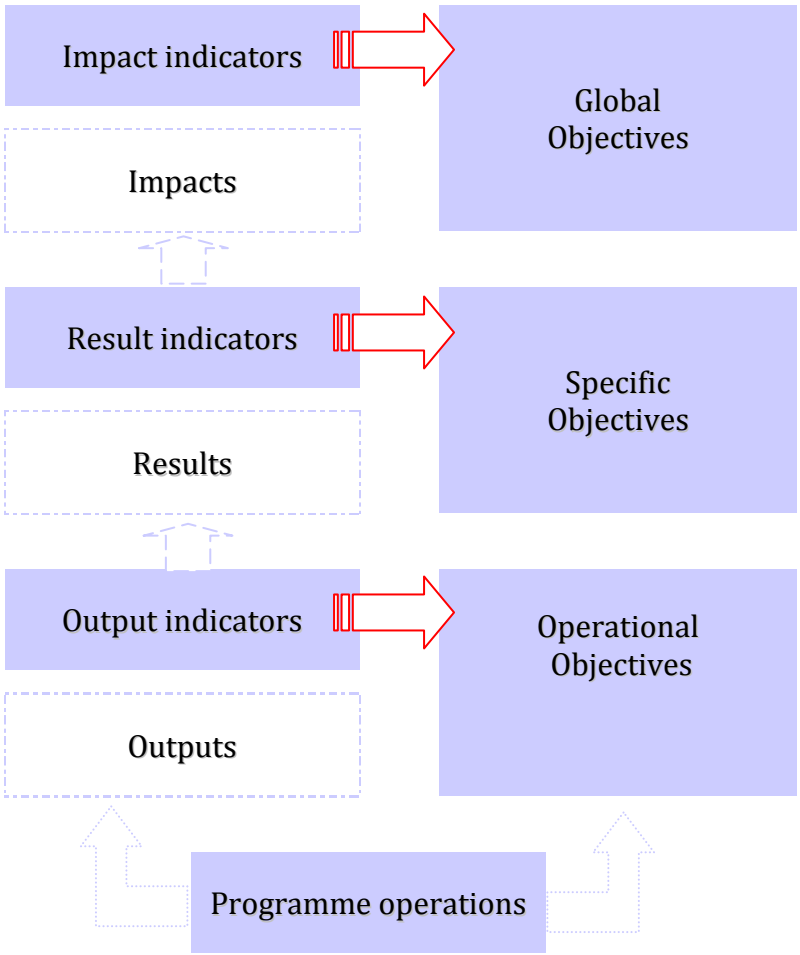
Context indicators suggested for the SOP Transport Romania	Rationale	
	SWOT analysis	specific objective (SO) and expected results (R) of the AP
Serious traffic accidents (number/year)	[W] Road network …. creating high accident risks	[SO1] … improving the safety of travel conditions…" [R] "… increase of the transport and transit safety of freight and passengers"
Fatalities caused by traffic accidents (number/year)	[W] Road network …. creating high accident risks	[SO1] … improving the safety of travel conditions…" [R] "… increase of the transport and transit safety of freight and passengers"
Share of goods transport, by mode of transport (%)	[W] rail passenger numbers and freight volume by rail is in decline	
Share of passenger transport, by mode of transport (%)	[W] rail passenger numbers and freight volume by rail is in decline	
Passenger transport performance, by mode of transport (mil passengers – km)	[W] rail passenger numbers and freight volume by rail is in decline	
Passengers carried, by mode of transport (thou passengers/year)	[O] Development of business travel and tourism through the increasing of customer demand for low cost air travel	[SO1] "Modernisation and development of the transport network of European and national interest …." [R] "Increase transport capacity"
Goods transport performance, by mode of transport (mil tonnes – km)	[W] rail passenger numbers and freight volume by rail is in decline	
Goods carried, by mode of transport (thou tonnes/year)	[O] potential development of freight and container traffic by waterborne means, strengthening of business climate [W] lack of investment in river management and services [T] diminishing international transit flows, further decline of rail transport;	[SO1] "Modernisation and development of the transport network of European and national interest …." [R] "Increase transport capacity"

Context indicators suggested for the SOP Transport Romania	Rationale	
	SWOT analysis	specific objective (SO) and expected results (R) of the AP
Density of roads network (km/ km2)		
Density of higher class roads (km/thou inhabitants)	[W] development and maintenance of the road network creating high accident risks, existing disproportion between the establishment of road and rail infrastructure	[SO1] "Modernisation and development of the transport network of European and national interest, increase of safety conditions and service quality"
Transport sector in GDP formation (%)	[O] the increased mobility in Europe will create the potential for economic growth in all economic regions	[SO2] "Increase of the competitiveness of the transport sector" [R]"Increase of the transport sector in GDP"
Share of the individual modes of transport in CO2 (kt)	[W] High contribution of transport to the air pollution	

2.1.2. OBJECTIVES COVERED

A key tool in analysing the consistency of the indicators at system level is to check their correlation with the objectives set at different levels of the OP.

The next figure describes how an intervention will contribute to the achievement of the operational, specific and global objectives of the Operational Programme.



As it could be seen in the figure, when the programme operation (a project or a group of projects) is implemented, the operational objectives can be achieved and measured as outputs. The subsequent results are the immediate effects of operations, which contribute to the achievement of the specific objectives. Impacts should contribute to reaching the overall objectives of the programme.

The indicators are used to assess at each level (output, result, impact) how far the expected objectives have been achieved.

By correlating the indicators with objectives it was expected to identify:

1) Indicators that remain "outside" objectives;
2) Indicators that were inappropriately assigned to a certain level of objectives;
3) Objectives that cannot be measured for lack of indicators.

The first step consisted in outlining the objectives of OP Transport as well as the breakdown from global, to specific and operational objectives (the last two by the priority axis).

According to the objectives tree of OP Transport, the general objective of the OP is "*To promote a sustainable transport system in Romania, which will facilitate safe, fast and efficient movement of persons and goods with appropriate level of service at European standards, nationally, Europe-wide, and between and within Romanian regions*". This is further broken down into 4 specific objectives (SO):

SO1:	***Promote international and transit movements of people and goods <u>in Romania</u>*** by providing effective connections of the port of Constanta, as well as transit transport from EU to the South ***through the modernization and development of the relevant TEN-T priority axes applying necessary environmental measures***
SO2:	Promote ***effective movement of persons and goods among Romanian <u>regions</u>*** and their transfer from the hinterland to priority transport axes by ***modernizing and developing TEN-T and national networks according to sustainable development principles***
SO3:	Promote the development of *a* ***balanced transport system of modes***, based on the respective competitive advantage of each, by encouraging the development of rail, waterborne and intermodal transport
SO4:	Support sustainable transport development by ***minimizing adverse effects of transport on the environment and improving traffic safety and human health***

TECHNICAL ASSISTANCE

Technical assistance will support specific measures to address the main needs as regard the administrative management of the programme and the strengthening of capacity of the structures involved in the process of programming, implementation, monitoring, evaluation and control, as well as information and publicity activities.

By screening the SOP-T, the following operation objectives were identified by each priority axis (PA) in order to achieve the above mentioned specific objective:

PA1:	▪ ***modernization and development of road infrastructure along TEN-T axis*** ▪ ***development of railway infrastructure along TEN-T axis*** ▪ ***development of water transport infrastructure along TEN-T axis***
PA2:	▪ ***modernization and development of national road infrastructure outside the TEN-T priority axis*** ▪ ***modernisation and development of national railway infrastructure outside the TEN-T priority axis and passengers services*** ▪ ***modernisation and development of river and maritime ports infrastructure*** ▪ ***modernisation and development of air transport infrastructure***
PA3:	▪ ***promotion of inter-modal transport*** ▪ ***improve traffic safety across road transport*** ▪ ***improve traffic safety across railway transport*** ▪ ***improve traffic safety across water transport***

The second step was to map the link between the objectives and existing output and result indicators in the SOP-T and related FDI, so as to provide answer to the three tiers of analysis set out in the beginning of the subsection.

For the purpose of current analysis the link between indicators and objectives is graphically illustrated in the tables below and it starts with the programme interventions (activities).

Fig. 3 Coverage of Operational Objectives SOP T (P=programme, S=supplementary)

	INTERVENTIONS	OUTPUT INDICATORS	OPERATIONAL OBJECTICES
PA 1. Modernization and development of TEN-T priority axes aiming at sustainable transport system integrated with EU transport networks	*construction of motorways and bypasses*	▪ (P) TEN-new motorways completed ▪ (S) Length of new TEN-T roads – motorways (km) ▪ (S) Length of new TEN-T roads - bypasses (km)	***modernization and development of road infrastructure along TEN-T axis***
	works for modernisation of national roads	*no indicator defined*	
	preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation	*no indicator defined*	
	works for rehabilitation/ upgrading/ modernisation of TEN-T rail transport infrastructure	▪ (P) TEN-interoperable railway rehabilitated/upgraded ▪ (S) Length of TEN-T railway rehabilitated/upgraded (km)	***development of railway infrastructure along TEN-T axis***
	preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation	*no indicator defined*	
	works for improving the navigation conditions on the TEN-T inland waterways infrastructure	▪ (P) TEN-navigable waters fully open to navigation ▪ (S) Length of TEN-T waterways open to navigation (km)	***development of water transport infrastructure along TEN-T axis***
	preparation and supervision of projects for TEN-T waterways transport infrastructure; TA for projects implementation	*no indicator defined*	

	INTERVENTIONS	OUTPUT INDICATORS	OPERATIONAL OBJECTICES
PA 2. Modernization and development of the national transport infrastructure outside the TEN-T priority axes aiming at sustainable national transport system	*construction of bypasses, motorways and express roads*	*no indicator defined*	***modernization and development of national road infrastructure outside the TEN-T priority axis***
	works for rehabilitation/ upgrading of national roads located outside TEN-T priority axis	▪ (P) National roads rehabilitated (km) ▪ (S) Length of rehabilitated/ upgraded roads (outside TEN-T) - national roads (km) ▪ (S) Length of rehabilitated/ upgraded roads (outside TEN-T) – bypasses (km)	
	preparation and supervision of projects for road transport infrastructure outside TEN-T; TA for projects implementation	*no indicator defined*	***modernisation and development of national railway infrastructure outside the TEN-T priority axis and passengers services***
	modernisation of railways stations	▪ (P/S) Railway stations rehabilitated/upgraded (number)	
	rehabilitation of bridges and tunnels	▪ (S) Bridges/tunnels rehabilitated - railways (km)	
	modernisation of rolling stocks for railway passenger transport	*no indicator defined*	
	preparation and supervision of projects for rail transport infrastructure outside TEN-T; TA for projects implementation	*no indicator defined*	
	modernisation of ports infrastructure (river and maritime)	▪ (S) Rehabilitated ports (number)	***modernisation and development of river and maritime ports infrastructure***
	preparation and supervision of projects for ports infrastructure; TA for projects implementation	*no indicator defined*	
	modernisation and rehabilitation of airports	▪ (P) Airports rehabilitated/ upgraded (number)	***modernisation and development of air transport infrastructure***
	preparation and supervision of projects for air transport infrastructure; TA for projects implementation	*no indicator defined*	

INTERVENTIONS	OUTPUT INDICATORS	OPERATIONAL OBJECTICES

PA 3. Modernization of transport sector aiming at higher degree of environmental protection, human health and passenger safety	*construction and modernisation of modal infrastructures*	▪ (P) New/upgraded intermodal terminals (number)		***promotion of inter-modal transport***
	construction and modernisation of traffic safety on railway traffic safety on roads	▪ (P) Improved/ upgraded level crossing (number) ▪ (S) Railway level crossings - national roads (number) ▪ (P) Km of linear villages protected ▪ (S) Linear villages protected - national roads (km)	⇨	***improve traffic safety across road transport***
	construction and modernisation of infratructure for traffic safety on railway	▪ (P) Improved/ upgraded level crossing (number) ▪ (S) Railway level crossings - railways (number)	⇨	***improve traffic safety across railway transport***
	improve vessel traffic managemnt information	*no indicator defined*	⇨	***improve traffic safety across water transport***
	establishment of management environment system	▪ (P)Environment Strategy for Transport sector ▪ (S) Studies, analyses, reports, strategies - environmental protection	⇨	***minimise adverse effects of transport on the environment***
PA 4. Technical Assistance	*training*	▪ (P) Cumulated number of training seminars ▪ (S) Staff of MA and beneficiary having received training ▪ (S) Participants days - beneficiaries - management structures	⇨	***support management, coordination, implementation, monitoring and control***
	support for managing, implementing, monitoring, evaluation activities	▪ (S) Studies, analysis, reports, strategies ▪ (S) Meetings of relevant committees and working groups	⇨	
	information campaigns	▪ (P) Cumulated number of information materials and events ▪ (S) Information and publicity materials ▪ (S)Communication and promotion events	⇨	***support the information and publicity of SOP T***
	development of information portal	▪ (P) Total number of web hits	⇨	

Fig. 4 Coverage of Specific Objectives SOP T (P=programme, S=supplementary)

INTERVENTIOS	**RESULT**	**SPECIFIC**

		INDICATORS	OBJECTIVES
PA 1. Modernization and development of TEN-T priority axes aiming at sustainable transport system integrated with EU transport networks	*construction of motorways and bypasses* *works for modernisation of national roads*	▪ (P) Time savings – road (minutes) ▪ (S) Value for time savings for transported passengers and freight stemming from new and rehabilitated roads – road infrastructure (Euro/year) ▪ (P)TEN-T priority projects realised (%) ▪ (P) Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt) ▪ (S) Increase of passenger traffic (%) ▪ (S) Increase of freight traffic and transit (%) ▪ (S)TEN-T priority projects realised – road infrastructure (%)	***promote international and transit movement of people and goods [...] through the modernisation and development of the relevant TEN-T priority axis applying necessary environmental protection measures***
	preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation	*no indicator defined*	
	works for rehabilitation/ upgrading/ modernisation of TEN-T rail transport infrastructure	▪ (P) Time savings – rail (minutes) ▪ (S) Value for time savings for transported passengers and freight stemming from new and rehabilitated railways (Euro/year) ▪ (P) TEN-T priority projects realised (%) ▪ (P/S) Rail market share (%) ▪ (P) Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt) ▪ (S) Increase of passenger traffic – railways (%) ▪ (S) Increase of freight traffic and transit – railways (%) ▪ (S)TEN-T priority projects realised – railways (%)	
	preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation	*no indicator defined*	
	works for improving the navigation conditions on the TEN-T inland waterways infrastructure	▪ (P) TEN-T priority projects realised (%) ▪ (P) Inland freight traffic (million tonne – km) ▪ (P) Transport passengers on river and inland canals (millions) ▪ (P) TEN-T priority projects realised – inland water (%)	
	preparation and supervision of projects for TEN-T waterways transport infrastructure; TA for projects implementation	*no indicator defined*	

PA 2. Modernization and development of the national transport infrastructure outside the TEN-T priority axes aiming at sustainable national transport system	*INTERVENTIONS*	RESULT INDICATORS	SPECIFIC OBJECTIVES
	construction of bypasses, motorways and express roads *works for rehabilitation/ upgrading of national roads*	▪ (P) Time savings (minutes) ▪ (S) Number of projects realised ▪ (S) Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/year)	***promote efficient movement of persons and goods [...] by modernising national networks according to sustainable development principles*** **- development of a balanced transport system of modes**
	preparation and supervision of projects for road transport infrastructure outside TEN-T; TA for projects implementation	*no indicator defined*	
	modernisation of railways stations	▪ (P) Increase in railway passenger traffic (million passengers – km) ▪ (S) Increase of passenger traffic – railways (%)	
	rehabilitation of bridges and tunnels	*no indicator defined*	
	modernisation of rolling stocks for railway passenger transport	*no indicator defined*	
	preparation and supervision of projects for rail transport infrastructure outside TEN-T: TA for projects implementation	*no indicator defined*	
	modernisation of ports infrastructure (river and maritime)	▪ (P) Goods conveyed in transit through TEN-T ports, out of which (million tons): maritime/ river ▪ (S) Increase of passenger traffic - ports (%) ▪ (S) Increase of freight traffic and transit - ports (%)	
	preparation and supervision of projects for ports infrastructure; TA for projects implementation	▪ *no indicator defined*	
	modernisation and rehabilitation of airports	▪ (S) Increase of air passenger traffic (million passengers - km)	

	INTERVENTIONS	RESULT INDICATORS		SPECIFIC OBJECTIVES
PA 3. Modernization of transport sector aiming at higher degree of environmental protection, human health and passenger safety	*construction and modernisation of modal infrastructures*	*no indicator defined*		***improving transport safety by modes of transport***
	construction and modernisation of traffic safety on railway traffic safety on roads	▪ (P) Reduction in serious accidents (serious accidents/million passengers - car) ▪ (P)Reduction in fatalities (fatal accidents/million passengers – car) ▪ (S) Reduction of serious accidents - national roads (%) ▪ (S) Reduction of fatal accidents - national roads (%)		
	construction and modernisation of infratructure for traffic safety on railway	*no indicator defined*		
	improve vessel traffic managemnt information	*no indicator defined*		
	establishment of management environment system	*no indicator defined*		

The following could be observed from analysing the link between objectives and indicators at the level of SOP Transport:

- all the indicators currently in use can be associated with one of the objectives of the programme, operational or specific, and there are no indicators that remain "outside" of these objectives;
- no *output indicators* have been inappropriately assigned to the operational objectives;
- in respect to the third tier of the analysis "objectives that cannot be measured for lack of indicators it could be observed that formally, there are no *impact indicators* established to assess the achievement of long – term, widespread effects SOP Transport, therefore the global objective of the SOP T is currently reflected in the system of indicators only indirectly, through output and result indicators. In addition, a number of operational and specific objectives can be only partially measured because of lack of either output or result indicators for the following interventions:
    - OUTPUT
        - works for modernisation of national roads (PA 1)
        - preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation (PA 1),
        - preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation (PA 1)
        - preparation and supervision of projects for TEN-T waterways transport infrastructure; TA for projects implementation (PA 1)

- construction of bypasses, motorways and express roads (PA 2)
- preparation and supervision of projects for road transport infrastructure outside TEN-T; TA for projects implementation (PA 2)
- modernisation of rolling stocks for railway passenger transport (PA 2)
- preparation and supervision of projects for rail transport infrastructure outside TEN-T; TA for projects implementation (PA 2)
- preparation and supervision of projects for ports infrastructure; TA for projects implementation (PA 2)
- preparation and supervision of projects for air transport infrastructure; TA for projects implementation (PA 2)
- improve vessel traffic managemnt information (PA 3)

o RESULT

- preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation (PA 1)
- preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation (PA 1)
- preparation and supervision of projects for TEN-T waterways transport infrastructure; TA for projects implementation (PA1)
- preparation and supervision of projects for road transport infrastructure outside TEN-T; TA for projects implementation (PA 2)
- rehabilitation of bridges and tunnels (PA 2)
- modernisation of rolling stocks for railway passenger transport (PA 2)
- preparation and supervision of projects for rail transport infrastructure outside TEN-T: TA for projects implementation (PA 2)
- preparation and supervision of projects for ports infrastructure; TA for projects implementation (PA 2)
- construction and modernisation of modal infrastructures (PA 3)
- construction and modernisation of infratructure for traffic safety on railway(PA 3)
- improve vessel traffic managemnt information (PA 3)
- establishment of management environment system (PA 3)

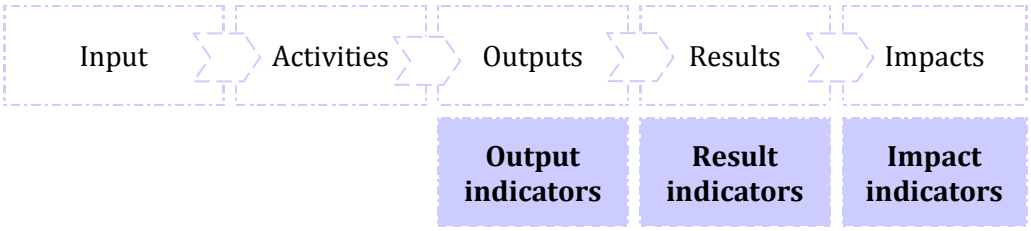
Preliminary remarks

The overall conclusion is that although objectives of SOP Transport are sufficiently covered by existing output and result indicators, there is room for enhancing their ability to capture the main interventions supported, by filling in the identified gaps.

2.1.3. INTERVENTION LOGIC

The "intervention logic" was built on the cause-effect relationship among inputs, activities, outputs, results and impacts. Thus, resources *(inputs)* are used to undertake the concrete interventions *(activities)* that will generate the *outputs*, which lead to the achievement of the direct and immediate effects of interventions *(results)* that contributes to longer-term and broader effects *(impact)*.

The above described relationship provides the structure around which the measurement of performance by the use of indicators could be constructed. Different types of indicators correspond to each stage of the causal chain (see below figure).



The following tables show the causal link between the output and result indicators for each PA of SOP T in order to better understand whether there are indicators that fall outside the logical pattern. As in the SOP T impact indicators were not identified, the last causal relation (result indicators- impact indicators) is not treated.

For the purpose of current analysis the causal link between indicators is graphically illustrated in the tables below and it starts with the programme interventions (activities) which generate the effects without presenting the outputs and results that are measured.

Fig. 6 intervention LOGIC SOP T (P=programme, S=supplementary)

	INTERVENTIONS	OUTPUT INDICATORS	RESULTS INDICATORS
PA 1. Modernization and development of TEN-T priority axes aiming at sustainable transport system integrated with EU transport networks	*construction of motorways and bypasses*	▪ (P) TEN-new motorways completed ▪ (S) Length of new TEN-T roads – motorways ▪ (S) Length of new TEN-T roads - bypasses (km)	▪ (P) Time savings – road (minutes) ▪ (S) Value for time savings for transported passengers and freight stemming from new and rehabilitated roads – road infrastructure (Euro/ year) ▪ (P) TEN-T priority projects realised (%) ▪ (P) Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt) ▪ (S)Increase of passenger traffic (%) ▪ (S) Increase of freight traffic and transit (%) ▪ (S) TEN-T priority projects realised – road infrastructure (%)
	works for modernisation of national roads	*no indicator defined*	
	preparation and supervision of projects for TEN-T road transport infrastructure; TA for projects implementation	*no indicator defined*	
	works for rehabilitation/ upgrading/ modernisation of TEN-T rail transport infrastructure	▪ (P) TEN-interoperable railway rehabilitated/upgraded ▪ (S) Length of TEN-T railway rehabilitated/upgraded (km)	▪ (P) Time savings – rail (minutes) ▪ (S)Value for time savings for transported passengers and freight stemming from new and rehabilitated railways (Euro/year) ▪ (P) TEN-T priority projects realised (%) ▪ (P) Rail market share (%) ▪ (P) Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt) ▪ (S) Railway transport market share (%) ▪ (S) Increase of passenger traffic – railways (%) ▪ (S) Increase of freight traffic and
	preparation and supervision of projects for TEN-T rail transport infrastructure; TA for projects implementation	*no indicator defined*	

			transit – railways (%)
	works for improving the navigation conditions on the TEN-T inland waterways infrastructure	▪ (P) TEN-navigable waters fully open to navigation ▪ (S) Length of TEN-T waterways open to navigation (km)	▪ (P) TEN-T priority projects completed (%) ▪ (P) Inland freight traffic (million tonne – km)* ▪ (P) Transport passengers on river and inland canals (millions)* ▪ (S) TEN-T priority projects realised – inland water (%)
	preparation and supervision of projects for TEN-T waterways transport infrastructure; TA for projects implementation	*no indicator defined*	

* the indicators represents the cumulative effects of SOP T priority axis 1 and 2 (SOP T 2007)

	INTERVENTIONS		OUTPUT INDICATORS		RESULTS INDICATORS
PA 2. Modernization and development of the national transport infrastructure outside the TEN-T priority axes aiming at sustainable national transport system	*construction of bypasses, motorways and express roads*		*no indicator defined*		▪ (P) Time savings (minutes) ▪ (S) Number of projects realised ▪ (S) Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/year)
	works for rehabilitation/ upgrading of national roads		▪ (P) National roads rehabilitated (km) ▪ (S) Length of rehabilitated/ upgraded roads (outside TEN-T) - national roads (km) ▪ (S) Length of rehabilitated/ upgraded roads (outside TEN-T) - bypasses (km)		
	preparation and supervision of projects for road transport infrastructure outside TEN-T; TA for projects implementation		*no indicator defined*		*no indicator defined*
	modernisation of railways stations	▪	▪ (P/S) Railway stations rehabilitated/ upgraded (number)		▪ (P)Increase in railway passenger traffic (million passengers – km) ▪ (S)Increase of passenger traffic – railways (%)
	rehabilitation of bridges and tunnels	▪	▪ (S) Bridges/tunnels rehabilitated – railways (km)		*no indicator defined*
	modernisation of rolling stocks for railway passenger transport		*no indicator defined*		*no indicator defined*
	preparation and supervision of projects for rail transport infrastructure outside TEN-T; TA for projects implementation		*no indicator defined*		*no indicator defined*

	modernisation of ports infrastructure (river and maritime)	▪ (S) Rehabilitated ports (number) ▪	▪ (P) Goods conveyed in transit through TEN-T ports (million tons), out of which: -maritime - river ▪ (P) Inland freight traffic (million tonne – km)* ▪ (P) Transport passengers on river and inland canals (millions)* ▪ (S) Increase of passenger traffic - ports (%)	
	preparation and supervision of projects for ports infrastructure; TA for projects implementation	*no indicator defined*	▪ (S) Increase of freight traffic and transit - ports (%)	
	modernisation and rehabilitation of airports	▪ (P) Airports rehabilitated/ upgraded (number)	*no indicator defined*	
	preparation and supervision of projects for air transport infrastructure; TA for projects implementation	*no indicator defined*		

* the indicators represents the cumulative effects of SOP T priority axis 1 and 2 (SOP T 2007)

	INTERVENTIONS	OUTPUT INDICATORS	RESULT INDICATORS
PA 3. Modernization of transport sector aiming at higher degree of environmental protection, human health and passenger safety	*construction and modernisation of modal infrastructures*	(P) New/upgraded intermodal terminals (number)	*no indicator defined*
	construction and modernisation of traffic safety on railway traffic safety on roads	▪ (P) Improved/ upgraded level crossing (number) ▪ (S) Railway level crossings - national roads (number) ▪ (P) Km of linear villages protected ▪ (S) Linear villages protected - national roads (km)	▪ Reduction in serious accidents (serious accidents/million passengers - car) ▪ Reduction in fatalities (fatal accidents/million passengers – car) ▪ Reduction of serious accidents - national roads (%) ▪ Reduction of fatal accidents - national roads (%)
	construction and modernisation of infratructure for traffic safety on railway	▪ (P) Improved/ upgraded level crossing (number) ▪ (S) Railway level crossings - railways (number)	*no indicator defined*
	improve vessel traffic managemnt information	*no indicator defined*	*no indicator defined*
	establishment of management environment system	▪ (P)Environment Strategy for Transport sector ▪ (S) Studies, analyses, reports, strategies - environmental protection	*no indicator defined*

	INTERVENTIONS		OUTPUT INDICATORS		RESULT INDICATORS
PA 4. Technical Assistance	*training*	▪	▪ (P) Cumulated number of training materials ▪ (S) Staff of MA and beneficiary having received training (number) ▪ (S) Participants days – beneficiaries (number) ▪ (S) Participants days – management structures (number)	⇨	*no indicators defined*
	support for managing, implementing, monitoring, evaluation activities	▪	▪ (S) Studies, analysis, reports, strategies (number) ▪ (S) Meetings of relevant committees and working groups		
	information campaigns	▪	▪ (P) Cumulated number of information materials and events ▪ (S) Information and publicity materials ▪ (S)Communication and promotion events		*no indicators defined*

The following preliminary conclusions could be drawn:

1) generally, the system of indicators of SOP Transport follows the causal link between interventions, outputs and results indicators:
- for example, in the case of KAI 1.2, the money allocated to investments through the contracted projects (inputs) generate immediate outputs in the form of physical infrastructure (rehabilitated railway) which in turn generates savings by reducing the time travel for transported passengers and freight;
- besides one output indicator *(e.g. Length of new roads)*, may lead to more than a single result indicator *(Time savings, Value for time savings in Euro/year for transported passengers and freight stemming from new and reconstructed roads, TEN-T priority projects completed, Increase of freight traffic and transit, Increase of passenger traffic)*;

2) there are a number of programme interventions (activities) whose outputs cannot be measured due to the lack of "*output indicators",* consequently limiting the measurement of result indicators:
- works for modernisation of national roads (AP1/KAI 1.1);
- construction of bypasses, motorways and express roads (AP 2/KAI 2.1);
- modernisation of rolling stocks for railway passenger transport (AP 2/ KAI 2.2);
- improve vessel traffic management information (AP 3/KAI 3.2);
- support of preparation/supervision of projects or technical assistance for projects implementation (all KAIs under PAs 1÷3).

3) the output indicators related to the PA 4 Technical Assistance are not sequenced by any result indicators, therefore, the direct and immediate effects of the projects cannot be assessed;

4) there are a number of programme interventions (activities) whose result cannot be measured due to the lack of *"result indicators":*
- rehabilitation of bridges and tunnels;
- modernisation of rolling stocks for railway passenger transport;
- modernisation and rehabilitation of airports;
- construction and modernisation of modal infrastructures;
- construction and modernisation of infratructure for traffic safety on railway;
- improve vessel traffic managemnt information
- establishment of management environment system

5) following the revision process of SOP T indicators conducted in 2008-2009[6], a series of initial programme indicators were modified and introduced in the Framework Document for Implementation as supplementary indicators. This lead to the situation to have two indicators which are measuring the same output/result.

As a general conclusion, the system of indicators at the level of SOP Transport follows the logical pattern explained in the beginning of this section, except for a number of gaps that were identified and previously presented.

[6] Between 2008 -2009 was conducted a consultation process between SOP T MA and ACIS with the purpose to standardize information and carrying out a system that allows the organizing and comparing data, as well as bottom-up aggregation at different levels of OP and NSRF.

2.1.3.1 Effects on environment

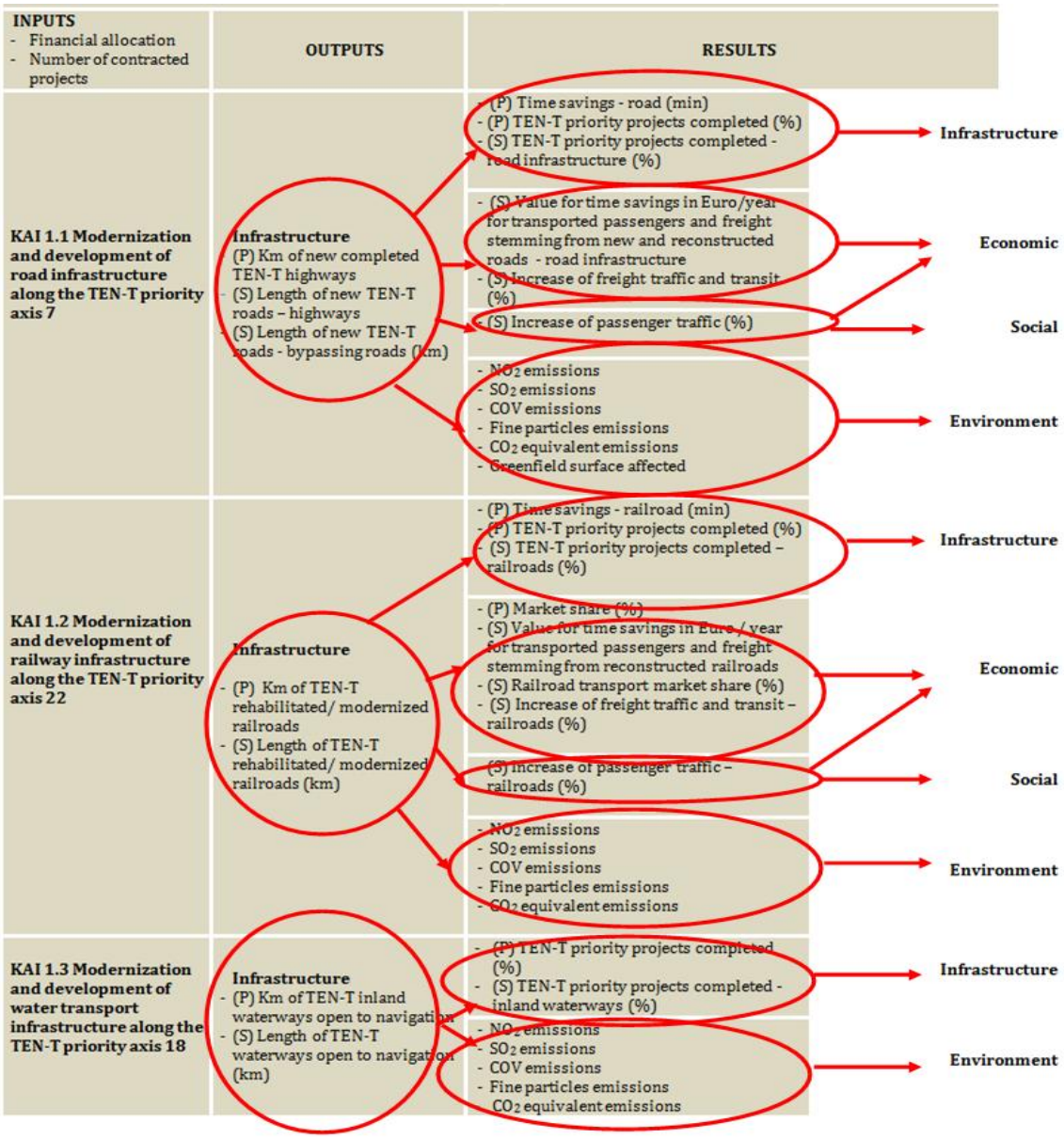
Through its interventions, the SOPT causes a series of outputs, results and impacts. The cause-effect relationship among these outputs, results and impact of the programme could be expressed through the three dimensions of sustainable development (economic, social and environmental):

a) Infrastructure: improved /extended physical infrastructure, reflected in indicators both as a direct output of the interventions and as "infrastructure-related" results, such as achieving targets for TEN-T network construction;
b) Economic: improved economic activity, reflected as result of investments in infrastructure;
c) Social: improved safety, accessibility and better services in the transport sector, reflected as result of investments in infrastructure;
d) Environment: reflected as direct outputs, such as specific works for environment protection and as results such as mitigation of environmental issues.

A separate thematic area (e) Institutional capacity can be assigned for Priority Axis 4 – Technical Assistance and for Priority Axis 3 – KAI 3.3, both as direct outputs (studies, strategies, training etc.) and results (increase of administrative capacity, increase of awareness).

In a nutshell, investments in the transport infrastructure may/should generate results such as: improving the transport network, contributing to economic activity, improving the social component (through accessibility and better services), diminishing negative effects on environment and increasing institutional capacity and so on.

As graphically presented below, environmental effects (which may be positive and/or negative) frequently occur in the case of the SOPT.


INPUTS
- Financial allocation
- Number of contracted projects
OUTPUTS
RESULTS
KAI 1.1 Modernization and development of road infrastructure along the TEN-T priority axis 7
Infrastructure
(P) Km of new completed TEN-T highways
(S) Length of new TEN-T roads – highways
(S) Length of new TEN-T roads - bypassing roads (km)
- (P) Time savings - road (min)
- (P) TEN-T priority projects completed (%)
- (S) TEN-T priority projects completed - road infrastructure (%)
Infrastructure
- (S) Value for time savings in Euro/year for transported passengers and freight stemming from new and reconstructed roads - road infrastructure
- (S) Increase of freight traffic and transit (%)
- (S) Increase of passenger traffic (%)
Economic
Social
- NO2 emissions
- SO2 emissions
- COV emissions
- Fine particles emissions
- CO2 equivalent emissions
- Greenfield surface affected
Environment
KAI 1.2 Modernization and development of railway infrastructure along the TEN-T priority axis 22
Infrastructure
- (P) Km of TEN-T rehabilitated/ modernized railroads
- (S) Length of TEN-T rehabilitated/ modernized railroads (km)
- (P) Time savings - railroad (min)
- (P) TEN-T priority projects completed (%)
- (S) TEN-T priority projects completed – railroads (%)
Infrastructure
- (P) Market share (%)
- (S) Value for time savings in Euro / year for transported passengers and freight stemming from reconstructed railroads
- (S) Railroad transport market share (%)
- (S) Increase of freight traffic and transit – railroads (%)
Economic
(S) Increase of passenger traffic – railroads (%)
Social
- NO2 emissions
- SO2 emissions
- COV emissions
- Fine particles emissions
- CO2 equivalent emissions
Environment
KAI 1.3 Modernization and development of water transport infrastructure along the TEN-T priority axis 18
Infrastructure
- (P) Km of TEN-T inland waterways open to navigation
- (S) Length of TEN-T waterways open to navigation (km)
- (P) TEN-T priority projects completed (%)
- (S) TEN-T priority projects completed - inland waterways (%)
Infrastructure
- NO2 emissions
- SO2 emissions
- COV emissions
- Fine particles emissions
CO2 equivalent emissions
Environment

Priority Axis 2 - Modernization and development of the national transport infrastructure outside the TEN-T priority axes aiming at sustainable national transport system

INPUTS - Financial allocation - Number of contracted projects	OUTPUTS	RESULTS	
KAI 2.1. Modernization and development of national road infrastructure	**Infrastructure** - (P) Km of rehabilitated national roads - (S) Length of rehabilitated/modernized outside TEN-T - national roads (km) - (S) Length of rehabilitated/ modernized roads outside TEN-T - bypassing roads (km)	- (P) Time savings (min) - (P) Number of completed projects	**Infrastructure**
		- (S) Value for time savings for transported passengers and freight stemming from new and reconstructed roads – road infrastructure (Euro/year)	**Economic** **Social**
		- NO_2 emissions - SO_2 emissions - COV emissions - Fine particles emissions - CO_2 equivalent emissions - Greenfield surface affected	**Environment**
KAI 2.2. Modernization and development of national railway infrastructure and passenger service	**Infrastructure** - Rehabilitated/modernized railway stations (no.) - Rehabilitated railway bridges/tunnels (km)	- (P) Increase of passenger traffic on railroads (mil. passengers – km) - (S) Increase of passenger traffic on railroad (%)	**Economic** **Social**
		- NO_2 emissions - SO_2 emissions - COV emissions - Fine particles emissions - CO_2 equivalent emissions	**Environment**
KAI 2.3. Modernization and development of river and maritime ports	**Infrastructure** (S) Rehabilitated ports	- (P) Freight traffic on waterways (mil. tkm - km) - (P) Passengers transported on waterways and canals (mil.) - (P) Freight traffic and transit in TEN-T ports, out of which maritime/inland (mil. tones) - (S) Increase of passenger traffic - ports (%) - (S) Increase of freight traffic and transit - ports (%)	**Economic**
		- (P) Passengers transported on waterways and canals (mil.) - (S) Increase of passenger traffic - ports (%)	**Social**
		- NO_2 emissions - SO_2 emissions - COV emissions - Fine particles emissions CO_2 equivalent emissions	**Environment**
KAI 2.4. Modernization and development of air transport infrastructure	**Infrastructure** - (P) Rehabilitated airports	- (P) Increase of passenger air traffic (mil. passengers-km) - (S) Increase of passenger traffic - airports	**Economic** **Social**
		- NO_2 emissions - SO_2 emissions - COV emissions - Fine particles emissions - CO_2 equivalent emissions	**Environment**

Priority Axis 3 - Modernization of transport sector aiming at higher degree of environmental protection, human health and passenger safety			
INPUTS - Financial allocation - Number of contracted projects	**OUTPUTS**	**RESULTS**	
KAI 3.1 Promote inter-modal transport	**Infrastructure** - (P) New/modernized intermodal terminals (no.)	- No indicator to measure the results	?
KAI 3.2. Improve traffic safety across all transport modes	**Infrastructure** - (P) Railway level crossings (no.) - (P) Km of linear villages protected - (S) Railway level crossings - railroads (no.) - (S) Railway level crossings - national roads (no.) - (S) Linear villages protected - national roads (km)	- (P) Reduction of serious accidents (serious accidents/mil. passengers vehicle) - (P) Reduction of fatal accidents (fatal accidents/mil. passengers-vehicle) - (S) Reduction of serious accidents - national roads (%) - (S) Reduction of fatal accidents - national roads (%)	Social
AI 3.3. Minimize adverse effects of transport on the environment	**Administrative capacity** - (P) Environment Strategy for the Transport sector (no.) - (S) Studies, analyses, reports, strategies – environment protection (no.)	- No indicator to measure the results	?

Priority Axis 4 – Technical assistance			
INPUTS - Financial allocation - Number of contracted projects	**OUTPUTS**	**RESULTS**	
KAI 4.1. Support for the SOPT management, implementation, monitoring, and control	- (P) Number of training seminars - (P) MA and beneficiaries' staff attending training courses (%) - (S) Studies, analysis, reports, strategies - technical assistance (no.) - (S)Meetings of relevant committees and working-groups (no.) - (S)Participant training days - (S)Participant training days – beneficiaries - (S) Participant training days - managing structures	- No indicator to measure the results	?
KAI 4.2 Support for information and publicity regarding SOPT	- (P) Total number of communication materials and events - (P) Website visitors (no) - (S) Information and publicity materials (no.) - (S) Communication and promotion events	(S) Website visits (no.)	**Administrative capacity/ awareness**

As presented above, one area of significant impact of transport investments is the environment.

In accordance with the provisions of the European and national environmental legislation, for the assessment of the potential effects of the infrastructure investments, the SOP T was subject of Strategic Environment Assessment (SEA).

SEA addresses the issue of environmental effects at the "ex-ante" moment, before the actual implementation of the programme was initiated and it was carried out with precisely this purpose: to identify, mitigate and even annul from the outset the possible significant effects, especially negative of the OP on environment.

Furthermore, environmental monitoring should be carried out during programme implementation, and after their completion. Thus, the SEA reports proposed **environmental indicators**, to be incorporated into the overall system of monitoring of the OP, which could be used selectively based on the characteristics of the projects selected for funding.

The environmental indicators are instruments which evaluate the positive or negative state of the environment and the consequences of applied measures.

The general systematic stages completed in the analysis of environmental indicators, were as follows:

- to group the areas of intervention in the SOPT by modes of the transport system: road, railways, water and air;
- to identify the effects of interventions, based on findings of SEA Report for each of the area of intervention;
- to identify the environmental aspects affected, based on the SEA Report. For an ease reference these were grouped into six main categories[7];
- to establish a correlation among different indicators proposed in the SEA Report and the environmental aspects;
- to correlate the SEA proposed indicators with the ones considered for further environmental monitoring by the MA SOP T.

[7] 1. AMBIENT and AIR QUALITY; 2. CLIMATE CHANGE; 3. WATER and SOIL; 4. BIODIVERSITY, LANDSCAPE and CULTURAL HERIRAGE; 5. POPULATION and HUMAN HEALTH; 6. RESOURCES and ENERGY EFFICIENCY

	AREAS OF INTERVENTION	EFFECTS of INTERVENTIONS		ENVIRONMENTAL ASPECTS	SEA PROPOSED ENVIRONMNETAL INIDCATORS	OP ENVIRONMENTAL INDICATORS
ROAD TRANSPORT INFRASTRUCTURE	▪ *modernisation and development of road infrastructure along TEN-T priority axis* ▪ *modernisation and development of national road infrastructure* ▪ *improve traffic safety across roads* ▪ *initiatives of minimising adverse effects of transport*	(-) construction of new road infrastructure or upgrading the technical parameters of the existing one will lead to increasing the traffic, therefore the traffic-related polluting emissions;	⇨	**AMBIENT and AIR QUALITY**	Emissions in kilotons per year by mode of: ▪ SOx ▪ NOx ▪ VOCs ▪ PM10	▪ NO2 emissions (kt) ▪ SO2 emissions (kt) ▪ VOC emissions (kt) ▪ Fine particles emissions (kt)
		(-/+) the increase of traffic means more motor vehicles and more fuel consumption, therefore GHG emission. Still, the due to improved technical parameters contributes to the reduction of fuel so the GHG will be lower, mainly due to the reduction of travel time;	⇨	**CLIMATE CHANGE**	▪ Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt/ year)	CO2 equivalent emissions (kt)
		(+/-) the improved technical parameters of the road infrastructure will led to reduction of road accidents, therefore of water and soil pollution. Still, the intensification of traffic have consequences on the soil pollution	⇨	**WATER and SOIL**	▪ The number of illegal and accidental discharges of pollutants by modes on surface and underground waters ▪ Reduction of emissions to water due to projects ▪ The number of accidents causing soil pollution	
		(-) the construction of new road infrastructure may cause habitat and land fragmentation and degradations in nature;	⇨	**BIODIVERSITY, LANDSCAPE and CULTURAL HERIRAGE**	▪ Land fragmentation increase due to SOP T ▪ Infrastructure surface land take in Romania (increase due to projects) ▪ Fragmentation area of ecosystems and habitats	
		(+) construction of TEN-T corridors and bypasses will reduce the traffic-related polluting emissions and the exposure of population in the urban areas from where the	⇨	**HUMAN HEALTH**	▪ Percent of population exposed to traffic noise ▪ Number (or %) of people living in the areas with the air pollution levels exceeded	

		traffic was shifted; (+/-) the improvement of infrastructure parameters will diminish the road accidents. Still, the speed and traffic increase will maintain upper the risk of accidents; (-)construction of new road infrastructure or upgrading the technical parameters of the existing one will lead to increasing the traffic, therefore the traffic-related polluting emissions and exposure of population in the closer areas; (+) the safety measures on roads will reduce the number of accidents; (-) the noise of the road operation affects those living in the close area;			▪ Change in number of fatalities due to traffic accidents (by mode of transport)	
		(-/+) the improvement of infrastructure parameters will increase the traffic, therefore the use resources, but will increase the fuel efficiency	⇨	**RESOURCES and ENERGY EFFICIENCY**	▪ Transport final energy consumption (total by mode)	

	AREAS OF INTERVENTION	EFFECTS of INTERVENTIONS		ENVIRONMENTAL ASPECTS	SEA PROPOSED ENVIRONMNETAL INIDCATORS	OP ENVIRONMENT INDICATORS
RAIL TRANSPORT INFRASTRUCTURE	▪ *modernisation and development of rail infrastructure along TEN-T priority axis* ▪ *modernisation and development of national railway infrastructure and passenger service* ▪ *improve traffic safety across rails* ▪ *initiatives of minimising adverse effects of transport*	(+) upgrading the technical parameters of the existing rail infrastructure will lead to the use of high-speed trains, therefore improve the environmental performance of trains; (+) because the trains run on electricity rather than diesel, the only air quality impact along the route will result from the train stations;	⇨	**AMBIENT and AIR QUALITY**	Emissions in kilotons per year by mode of: ▪ SOx ▪ NOx ▪ VOCs ▪ PM10	▪ NO2 emissions (kt) ▪ SO2 emissions (kt) ▪ VOC emissions (kt) ▪ Fine particles emissions (kt)
		(+) the extended high speed rail network will have a positive impact on GHG emissions due to reduced travel times, and the modernization of passengers services will encourage the travelers to switch their journeys from road to rail	⇨	**CLIMATE CHANGE**	▪ Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt/ year)	CO2 equivalent emissions (kt)
		(+/-) the improved technical parameters of the road infrastructure will led to reduction of rail accidents, there of water and soil pollution. Still the increase in rail traffic will continue to contribute to the soil pollution;	⇨	**WATER and SOIL DETERIORATION**	▪ The number of illegal and accidental discharges of pollutants by modes on surface and underground waters ▪ Reduction of emissions to water due to projects ▪ The number of accidents causing soil pollution	
		(-) the modernisation and development of rail infrastructure may cause habitat and land fragmentation, degradations in nature and cultural heritage;	⇨	**BIODIVERSITY, LANDSCAPE and CULTURAL HERIRAGE**	▪ Land fragmentation increase due to SOP T ▪ Infrastructure surface land take in Romania (increase due to projects) ▪ Fragmentation area of ecosystems and habitats	

		(+) improving the rail fleet and introduction of high speed trains will be encouraged the traffic diversion from road to rail, therefore the exposure of population in the closer areas will be reduced (+) railway infrastructure with technical parameters improved and the safety measures on rails contributes to reduction of number of accidents; (-) the noise of the railways operation affects those living in the close area;	⇨	**HUMAN HEALTH**	▪ Percent of population exposed to traffic noise ▪ Number (or %) of people living in the areas with the air pollution levels exceeded ▪ Change in number of fatalities due to traffic accidents (by mode of transport)	
		(-/+) the improvement of infrastructure parameters will increase the traffic, therefore the use resources, but will increase the fuel efficiency	⇨	**RESOURCES and ENERGY EFFICIENCY**	▪ Transport final energy consumption (total by mode)	

	AREAS OF INTERVENTION	EFFECTS of INTERVENTIONS		ENVIRONMENTAL ASPECTS	SEA PROPOSED ENVIRONMNETAL INIDCATORS	OP ENVIRONMENT INDICATORS
WATER TRANSPORT INFRASTRUCTURE	▪ *modernisation and development of water transport infrastructure along the TEN-T priority axis* ▪ *modernisation and development of river and maritime* ▪ *improve traffic safety across water transport* ▪ *initiatives of minimising adverse effects of transport*	(-) the modernisation of transport infrastructure will increase the traffic on water and ports operations, therefore the exhaust missions from vessels; (+) modernization and upgrading of inland waterways will encourage the traffic diversion from cars to water	⇨	**AMBIENT and AIR QUALITY**	Emissions in kilotons per year by mode of: ▪ SOx ▪ NOx ▪ VOCs ▪ PM10	▪ NO2 emissions (kt) ▪ SO2 emissions (kt) ▪ VOC emissions (kt) ▪ Fine particles emissions (kt)
		(-) the modernisation of transport infrastructure will increase the traffic on water and ports operations , therefore the	⇨	**CLIMATE CHANGE**	▪ Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt/ year)	CO2 equivalent emissions (kt)
		(-) the modernisation of transport infrastructure will increase the traffic on water and ports operations, therefore water pollution	⇨	**WATER and SOIL DETERIORATION**	▪ The number of illegal and accidental discharges of pollutants by modes on surface and underground waters ▪ Reduction of emissions to water due to projects ▪ The number of accidents causing soil pollution	
		(-) the modernisation of transport infrastructure implies regularisation of river flow and increase of traffic on water and ports operations, therefore the aquatic ecosystem will be disturbed (-) in many instances vessels due to a variety of reasons intentionally discharge illegal wastes (-) modernization and development of ports will have affect the land and nature.	⇨	**BIODIVERSITY, LANDSCAPE and CULTURAL HERIRAGE**	▪ Land fragmentation increase due to SOP T ▪ Infrastructure surface land take in Romania (increase due to projects) ▪ Fragmentation area of ecosystems and habitats ▪ Number of illegal and accidental discharges of oil by ships at the sea and in the rivers	

		(+) modernization and upgrading of inland waterways will encourage the traffic diversion from cars to water, therefore the exposure of population to pollution will be reduced;	⇨	**HUMAN HEALTH**	▪ Percent of population exposed to traffic noise ▪ Number (or %) of people living in the areas with the air pollution levels exceeded ▪ Change in number of fatalities due to traffic accidents (by mode of transport)	
		(-/+) the improvement of infrastructure parameters will increase the traffic, therefore the use resources, but will increase the fuel efficiency	⇨	**RESOURCES and ENERGY EFFICIENCY**	▪ Transport final energy consumption (total by mode)	

	AREAS OF INTERVENTION	EFFECTS of INTERVENTIONS		ENVIRONMENTAL ASPECTS	SEA PROPOSED ENVIRONMNETAL INIDCATORS	OP ENVIRONMENT INDICATORS
AIR TRANSPORT INFRASTRUCTURE	▪ *modernisation and development of air transport infrastructure* ▪ *initiatives of minimising adverse effects of transport*	(-) modernisation will increase the operation of airports and aircrafts, which are a potential source of air pollution; (-) modernization of air infrastructure will increase the number of flights, therefore the car traffic to airports	⇨	**AMBIENT and AIR QUALITY**	Emissions in kilotons per year by mode of: ▪ SOx ▪ NOx ▪ VOCs ▪ PM10	▪ NO2 emissions (kt) ▪ SO2 emissions (kt) ▪ VOC emissions (kt) ▪ Fine particles emissions (kt)
		(-) the modernisation will increase the air traffic, therefore the GHG emissions;	⇨	**CLIMATE CHANGE**	▪ Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt/ year)	CO2 equivalent emissions (kt)
		(-) airport operations include many activities likely to result in the discharge of pollutants to adjacent water bodies	⇨	**WATER and SOIL DETERIORATION**	▪ The number of illegal and accidental discharges of pollutants by modes on surface and underground waters ▪ Reduction of emissions to water due to projects ▪ The number of accidents causing soil pollution	
		(-) the modernisation and development of air infrastructure may cause habitat fragmentation and degradations in nature;	⇨	**BIODIVERSITY, LANDSCAPE and CULTURAL HERIRAGE**	▪ Land fragmentation increase due to SOP T ▪ Infrastructure surface land take in Romania (increase due to projects) ▪ Fragmentation area of ecosystems and habitats ▪ Number of illegal and accidental discharges of oil by ships at the sea and in the rivers	
		(-) the noise of the aircraft operation affects those living near airports;	⇨	**HUMAN HEALTH**	▪ Percent of population exposed to traffic noise	

					▪ Number (or %) of people living in the areas with the air pollution levels exceeded ▪ Change in number of fatalities due to traffic accidents (by mode of transport)	
			⇨	**RESOURCES and ENERGY EFFICIENCY**	▪ Transport final energy consumption (total by mode)	

From analysing the link between SEA recommendations and environmental indicators at the level of SOP Transport it was observed that only 6 indicators (the same for each PA) were transposed from the SEA report/environmental certificate to the Framework Implementation Document (see above diagram).

According to the MA SOPT, this is due to the fact that no technical expertise in this field was available when the FID was drafted. Partly this was the appropriate approach; in the opinion of the MA a number of environmental indicators appear less relevant for the interventions financed under the SOP or for some of them data is difficult to collect and / or link with interventions financed under SOPT (e.g. "consumer waste from the transport sector").

Figure 6 (please see under), presents the environmental indicators considered as relevant for the SOPT as a result of our analysis[8].

Further than the indicators recommended in figure 6, we need to make some consideration, in this context, to the "Strategy for sustainable transport for 2007-2013 and 2020, 2030" ("Strategy"), financed under SOPT.

Considering the fact that the current and future SOPTs constitute important instruments for setting up and implementing the Strategy, and especially taking into account that the Strategy (including the related Action Plan) lists a very limited number of environment-specific indicators for measuring its performance (see Annexes 1a-e of the Strategy), we recommend the AM SOP T to keep in mind the following indicators, of maximum relevance for the Strategy:

Indicator
Final energy consumption by transport modes
Number of end-of-life vehicles
Number of recycled used tires

[8] The complete analysis is presented in the report issued under Activity 3.2. of this project, respectively "Creating the methodology for monitoring the OPs effects on environment"

2.1.4. CORE INDICATORS

The following table shows the correspondence between existing indicators of SOP-T and the core indicators which the European Commission suggests that Member States apply across ERDF and Cohesion Fund programmes, wherever appropriate, to facilitate comparable reporting among Member States (Working Document 7[9]).

FIG. 4 CORE INDICATORS SOP-T

Selected CORE Indicators that apply to SOP T	Corresponding indicators identified in SOP T	Observation
(13) Number of projects (Transport)		The indicator was not introduced in list of SOP T
(14) km of new roads	(S) Length of new TEN-T roads - motorways (KAI 1.1) - bypasses (KAI 1.1)	The indicator related to construction of roads out side TEN-T, *bypasses, motorways and express roads* (KAI 2.1), has not been introduced in SOP T (see conclusions related to Intervention Logic)
(15) km of new TEN-T roads	(S) Length of new TEN-T roads – motorways (KAI 1.1) – bypasses (KAI 1.1)	The indicator related to construction of roads out side TEN-T, *bypasses, motorways and express roads* (KAI 2.1), has not been introduced in SOP T (see conclusions related to Intervention Logic)
(16) km of reconstructed roads	(S) Length of rehabilitated/ upgraded roads (outside TEN-T) - national roads (KAI 2.1)	The indicator related to modernisation of TEN-T roads, *national roads* (KAI 1.1), has not been introduced in SOP T (see conclusions related to Intervention Logic)
(17) km of new railways	-	Not applicable to SOP T
(18) km of TEN-T railways	(S) Length of TEN-T rehabilitated/ upgraded railways (KAI 1.2)	
(19) km of reconstructed railroads	(S) Length of TEN-T rehabilitated/ upgraded railways (KAI 1.2)	
(20) Value for time savings in Euro / year stemming from new and reconstructed roads	(S) Value for time savings in Euro / year for transported passengers and freight stemming from new and reconstructed roads (KAI 1.1, 2.1.)	
(21) Value for time savings in Euro / year stemming from new and reconstructed railways	(S) Value for time savings in Euro / year for transported passengers and freight stemming from new and reconstructed railways (KAI 1.2)	

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The analysis of the adoption of core indicators shows that:

- the existing system of indicators does not include the exact label of core indicators in WD No 7. However, some supplementary indicators at PA 1 and PA 2 levels are similar as those included in the Working Document. They resulted from the revision process of SOP T indicators conducted by ACIS and MA SOP T that took account of the need for integrating core indicators;
- there is one indicator not integrated in the current system, at the programme and each priority axis level (except PA 4): (13) *Number of projects (Transport)*;
- for the quantification of the core indicator (14) *Km of new TEN-T roads,* the *length of bypasses, motorways and express ways built* (KAI 2.1) should be added as resulted from the analysis of Intervention Logic ;
- for the quantification of the core indicator (16) *km of reconstructed roads,* the *length of national roads rehabilitated/ upgraded* (KAI 1.1) should be added as resulted from the analysis of Intervention Logic
- the indicator (14) *km of new roads* is obtained by summing-up indicators measured under PA 1 and PA 2.

2.2. BALANCE

In order to assess the balance of the indicators system of SOP Transport, two main issues were analyzed:

1) **Proportionality**
2) **Distribution by types of indicators** (input, output, result, impact).

The analysis of proportionality started from the guidelines provided by the EC Working Document No. 2[10]:

> *"The indicator systems of complex programmes (e.g., within the Convergence Objective) with a high number of priorities and measures will necessarily be more difficult to manage than the system of a smaller programme. The challenge is to design indicator systems as complex as necessary and as small as possible under the specific circumstances of a specific programme. The aim is not to achieve an equal coverage of all programme and priority objectives. The impact and result indicators should cover priorities or measures which represent the bulk of expenditure or are of strategic importance from the point of view of programme objectives or the information needs of the potential users."*

The following aspects were extracted as being the most relevant for the analysis:

- Generally, result and impact indicators need most care and are not necessary to be assigned to every intervention financed under the programme. Since OP Transport does not have impact indicators, result indicators were given careful consideration and were chosen as the first criterion;
- Complexity of the intervention should be taken into account: in the sense of this analysis, a complex intervention, within OP-Transport, is one with several possible results and/or with long term or complicated implementation[11];
- The system of indicators should take into account the scale of the intervention; therefore, financial allocation was one of the criteria for analysis.

[10] DG Regional Development, Indicative Guidelines on Evaluation Methods: Monitoring and Evaluating Indicators, Working Document No.2, Aug.2006, p.21

[11] Own interpretation, starting from the EC understanding of a complex programme

Funds[12] (MEUR)	Input (allocation)	**Categories**									
		Output			Result			Impact	**Total**		
		P	S	TOTAL	P	S	TOTAL		P	S	TOTAL
Axis 1: 3.855	68%	3	4	7	10	9	19	0	13	13	26
Axis 2: 1.397	25%	3	5	8	5	5	10	0	8	10	18
Axis 3: 322	5%	5	4	9	2	2	4	0	7	6	13
Axis 4: 123	2%	4	5	9	0	0	0	0	4	5	9
Total funds: 5.697	100% (23.7% of NSRF)	15	18	33	17	16	33	0	32	34	66
TOTAL			33			33		0		66	

(P=programme, S=supplementary)

Following the analysis of the proportionality of the indicators system based both on the quantitative data provided by the previous table (number of indicators) and on qualitative information, such as number and types of interventions (activities) supported by each PA, it was outlined that:

- Priority Axis 1 has the largest allocation (marked in the Figure below by ++) and supports only a number of 5 (five) interventions related to large infrastructure projects (marked by +);
- Priority Axis 2 has an average allocation (0), but is very complex (++) as it supports 8 (eight) different types of interventions;
- Priority Axis 3 has a small allocation (marked with -) and supports a number of 5 (five) interventions (+);
- Priority Axis 4 has a small allocation (marked with -) and supports a number of 4 (four) interventions (+);

The analysis is synthesized in the following table:

[12]Based on: Financial plan of the SOP-Transport giving, for the whole programming period, the amount of the total financial allocation of each fund in the operational programme, the national counterpart and the rate of reimbursement by priority axis, Chapter 4 - Financial Plan, SOP-Transport, EN version, 2007, p. 85

FIG. 7 BALANCE OF SOP-T SYSTEM OF INDICATORS

	Priority Axis 1	Priority Axis 2	Priority Axis 3	Priority Axis 4
Complexity	+	++	+	+
Financial allocation	++	0	--	---
Ideal number of indicators	High (40%)	Medium-High (30%)	Medium-Small (20%)	Small (10%)
Existing number of indicators	39.39%	27.27%	19.69%	13.63%
Conclusion	Proportion seems appropriate	Proportion seems appropriate	Proportion seems appropriate	Proportion seems appropriate

In respect to analyzing the **distribution between the output/result indicators**, the following observations can be made:

- Priority Axis 1: it has the largest number of result indicators (11 programme indicators and 9 supplementary indicators). This may stem a deficiency of the system and attention should be paid when analyzing result indicators, so as to avoid any unnecessary load;
- Priority Axis 2: it has a balanced distribution between output indicators (8) and the result indicators (9). Caution is necessary in interpreting this information, since the previous chapter signals that some interventions do not have any output and result indicators;
- Priority Axes 3: it has a smaller number of result indicators than output indicators. Again, caution is necessary in interpreting this information, since the previous chapter signals that some interventions do not have any output and result indicators;
- Priority Axes 4: it has no result indicators.

None of the PAs have any impact indicators associated.

The overall conclusion is that SOPT is not well balanced as regard the distribution by types of indicators (output, result, impact).

However, any recommendation in this respect should be made in relation to the findings and conclusions of all the other components of the analysis. A special attention should be paid to the fact that, as mentioned in the previous sections, the system contains a number of indicators that overlap, and therefore the necessary number of indicators for the measurement of programme performance could be lower.

2.3. MANAGEABILITY

2.3.1. OVERVIEW

This section assesses the main processes involved in working with SOPT indicators, namely collecting, measuring, processing, monitoring and communicating/reporting. The analysis covers also briefly the institutional context, the procedures and the resources available for running the above mentioned processes, from the specific SOP-T viewpoint.

Institutions in charge with SOP-T indicators	Types of indicators	Role	
		Direct	Indirect
Managing Authority for SOP-T	- Financial - Performance	- Defining - Collecting - Processing - Measuring (Analysing) - Monitoring - Communication	-

Institutions

SOPT has **no Intermediary Bodies**, which implies that the MA has a direct role in all indicator-related processes. In addition, most beneficiaries are structures under the authority of the Ministry of Transport and Infrastructure, which should, in principle, allow better institutional coordination.

In terms of indicator related processes, the **direct connection of the MA with project beneficiaries** should allow more accurate and on time data flow. No intermediaries would also usually imply better communication and reporting. In practice though, several bottlenecks were caused by the lack of a more detailed communication between the SOPT MA and beneficiaries on each of the different processes related to the working with indicators.

The institutions involved in monitoring the indicators are the following: the Service for Cohesion Fund Management and the Unit for ERDF Monitoring (subordinated to the Monitoring Directorate), the Financial Management Unit (within the Financial Management and Development Directorate), as well as the SOPT Transport Infrastructure Service (within the Programming Directorate).

A detailed outlay of the human resources allocated for each structure dealing with the indicator monitoring is presented in their corresponding internal procedures. Additionally, the Description of the Management and Control System of SOPT includes a nominal overview of the organisational structure as per February 2008[13]. As far as the Monitoring Committee is concerned, the latter gathers SOPT stakeholders.

Procedures

As in the case of the other OPs, there are no explicit instructions or internal regulations dedicated to the indicators' collection (same applies to monitoring, reporting or other

[13] Description of the Management and Control System of SOP-T, Appendix 11

processes). References to these can nonetheless be found in other procedures. Consequently, the various activities connected to this issue can be taken out from the Description of the Management and Monitoring System of SOPT. Based on formal documents, the existing institutional agreements, as well as the communication flows, are functional. The MA has developed specific instructions for the beneficiaries of SOP Transport, with respects to collection, by requiring them to provide data on indicators in the financing requests and progress reports.

Resources

Given the fact that no procedures have been designed to deal specifically with indicators, no resources are earmarked for the collection, monitoring and reporting of indicators. These tasks are the responsibility of the staff involved in related activities.

Noteworthy that at the level of the MA for SOP Transport a project for technical assistance was launched at the end of 2010[14]. The TA will aim at defining clear-cut procedures and improve the coordination between entities, which should also improve the interaction with SMIS.

2.3.2. DEFINING INDICATORS

An initial list of programme indicators for SOPT was defined during the programming exercise, and passed through the ex-ante evaluation. Later on, an additional number of supplementary indicators were added, based on the consultations between SOPT MA and ACSI, mostly at ACSI initiative.

The above mentioned consultations had at least two important goals: on one hand, to simplify the monitoring system, by avoiding the duplication of indicators in the case they apply to more categories of interventions, and, on the other hand, to add more clarity and value-added in the way each of the interventions is monitored.

Simplifying definitions

The simplification process led to the use of „Action Category", attached to the label of indicators, which allows the streamlining of indicators. For example, instead of having two indicators to reflect the length of a new TEN-T highway and of a new TEN-T bypassing road, one can just attach two action categories ("highways" and "bypassing roads") to the same indicator that reflects new TEN-T roads. The advantage of using Action Categories for SOP-T is given not only by the potential reduction in the number of indicators, but also by the possibility of using indicators defined for SOPT interventions for other OPs with similar interventions (e.g. within ROP there are also interventions to build roads, but at regional/local level instead of TEN-T / national).

This simplification is allowed by the SMIS, which has the "Action Category" function already embedded in its architecture. However, although currently used as an IT function for the supplementary indicators, the Action Categories have not been yet recognized as such and included in any official SOPT documents by the MA. As a result, the Framework Document for Implementation is listing the supplementary indicators one by one, by combining the indicator names with their respective Action Categories, without explaining the use of intervention categories. Allowing the use of Action Categories would greatly simplify the list

[14] According to consultation process - surveys

of indicators. Also, the current list of Action Categories should not be seen as final, as in some cases, adding more categories may reflect and monitor better the nature of the interventions.

Clarifying definitions, labels and measurement units

The purpose of adding more clarity was taking into account when a few supplementary indicators were added in order to better assess the result of the planned intervention (e.g. "value of time savings" instead of "time savings"). This attempt was aimed at improving labels and measuring units as well. However, the initial programme indicators were not removed, so now both the programme and the supplementary indicators are defined within the monitoring system. This is causing a certain degree of redundancy and should be further simplified.

As regards the measurement unit, there still is a lot of inconsistency. Several indicators have the measurement unit included in the definition, such as "*Km of new TEN-T highways completed*". Others have the measurement unit expressed in brackets at the end of the definition, which seems far more appropriate. Therefore, it is advisable to provide a minimum level of standardization, and place all measurement units at the end of the definitions.

At the time when several supplementary indicators were added, there were no additional resources earmarked for this process, other than the combined effort of ACSI – ECU and SOPT MA staff. Later on, ECU has contracted the current project for helping also with improving the definitions of the SOPT indicators.

2.3.3. COLLECTING INDICATORS

Once the indicators were defined and included in the Framework Document for Implementation (both initial programme indicators and supplementary ones), their collection became mandatory, based on the SOPT procedures.

However, project level information is not enough to collect all required SOPT indicators, which is quite obvious. Only some of the output indicators may be compiled based on direct information from beneficiaries. For result/context indicators, often a more complex analysis is required, which will imply more than information from beneficiaries (e.g. use of national statistics etc.)

Unfortunately, the SOPT MA is expecting that SMIS would provide information on most indicators. The SMIS is seen therefore responsible with collecting information about indicators. However, SMIS is just an IT tool, designed to support the overall monitoring of structural funds, and cannot provide accurate data if not suitably fed with proper data. This implies that if the SOPT MA would not process the information from beneficiaries (reports) and input it into SMIS, then the SMIS would not be able to process required data on indicators. As an example, for each project, feasibility studies from beneficiaries should assess the "value of time savings" and the MA should then take such info and input it right away into SMIS, so that it may aggregate across the OP (more on aggregation will be discussed in the processing subsection). This is a clear example of enforcing current formal procedures, and current failure to do so is due to lack of internal resources within the MA. The development of MySMIS will transfer most of this burden to beneficiaries, and will ease the pressure on the MA. But until then, the SOPT should try to find an interim solution that will improve collection.

For the indicators which cannot be calculated based on input from beneficiaries, there is a need to define in a more clear way the collection procedure. This implies a closer link to

official transport statistics and an enhanced capacity to analyse statistical indicators within the SOP-T MA. This applies to most of the result indicators. Moreover, the SOP-T does not have currently any official context indicators, which is a weakness in terms of its overall monitoring. The proper collection of context indicators is also heavily related to existing of good and reliable statistics in the field of transport.

Last but not least, there is no point in officially adopting indicators that are just preliminary inputs for other indicators. This redundancy can be avoided by just keeping the most relevant indicator (see individual analysis) and organise well the collection process, so that the preliminary inputs are calculated according to a robust and standardized methodology. The best example to illustrate such situation applies to the calculation of *Time savings* and *Value of time savings*, where the latter indicator is computed on the basis of the first one.

2.3.4. PROCESSING AND MEASURING INDICATORS

Processing and measuring indicators for SOP-T should follow the general principles of a simple and flexible monitoring system:

- Should allow the aggregation of data from lower to higher level and the generation of monitoring reports (**vertical aggregation**).
- Should take into account the overall need at NSFR level for overall monitoring of the same intervention fields (e.g. Investment in roads), which implies **horizontal aggregation** across OPs.

Vertical aggregation

Already mentioned in the subsection related to collection, the issue of **connecting project level to programme level indicators** is crucial to facilitate proper processing and measuring of SOPT indicators. Currently, there is no perfect match between the indicators required in the application process, the ones required in the progress/financial reporting and the programme indicators. The Applicants' Guide provides no clues on how and why the indicators should be collected and processed. Such mismatch hinders the full functionality of the SMIS in terms of automatically aggregating data, which sometimes leads to a situation where the SOP-T MA is processing/measuring programme indicators using other more time consuming and costly means, such as manual analysis outside SMIS. Therefore, better coordination is needed in order to harmonize project level indicators with programme level ones.

Horizontal aggregation

Processing and measuring some of SOPT interventions cannot be done completely independent from other OPs. As mentioned in the subsection related to defining indicators, SOPT shares interventions that are common to other OPs as well. The methodology for processing the value of time savings for modernizing a larger road (e.g. national road) is practically the same in the case of modernizing a smaller road (e.g. county road). This favours the use of a single indicator, with a separate description of the categories of interventions in which it can be used, with the same processing methodology.

Such option can be easily reached by officialising the use of "Action Category" as it is currently provided by SMIS. The use of Action Categories already has lead to the simplification and

better coordination of the indicators system at NSRF level, and has further potential on this path, highly relevant for SOPT.

2.3.5. PROGRESS MONITORING

As part of the Cohesion Fund rules, on SOP Transport **monitoring is undertaken only at national level** (NUTS 1). While programmes developed at sub-national/regional level involve a multitude of stakeholders, who may influence the choice of monitoring indicators, for the programmes developed at national level, such as SOP Transport, the central government (represented by ACSI and the SOPT MA) is, *de facto*, the only actor in any monitoring arrangement.

Another feature of SOPT is that the European Commission is closer involved in approving and even monitoring large infrastructure projects. The approval of projects under 50 million EUR is done by the MA, while projects over 50 million EUR are approved by the European Commission, which follows their implementation after the approval. This **special interest of the EC** creates more pressure in terms of the accuracy and availability of monitoring.

Due to the complexity of large infrastructure works and the long duration implied, **most output indicators are not very sensitive in time,** as they have a limited capacity of reflecting work in progress.

Such indicators can only be reported either when the work is done, in case of "no. of ...", or when sections are finalised, in case of "length of...". This means that although works monitoring can be done on a regular basis, monitoring output indicators can only be done at different stages, depending on (sub)works duration.

This situation is neither a malfunction of the system nor a difficult choice when selecting output indicators. This is a general feature of the OPs involving large infrastructure projects, such as SOPT.

Due to the nature, cost and implementation cycle of large infrastructure projects (presented earlier), there is a need for more accurate monitoring of the work in progress, at project level. For reason of not complicating the programme level monitoring, there is no point in upgrading project level indicators into programme level ones, just for the sake of reporting progress more frequently.

SMIS has provided a solution by providing an option to select for each project a list of '*Discrete Physical Parts'*. These refer to the quantities of materials and services used in the actual construction of infrastructure. As a result, work in progress can be tracked through both input indicators (financial spending) and the "physical parts" delivered, matching contractual obligations/invoices.

This allows the monitoring system to be flexible and simple, whereas it also provides the needed info for an updated track of progress.

How complex or simple should be the list of monitored "physical parts" relies heavily on the perspective of SOPT MA and ACSI. On one hand, a more rigorous and comprehensive list would help probably the audit perspective. On the other hand, the more "parts" are monitored, the more administrative effort needs to be considered by SOPT MA.

2.3.6. COMMUNICATION

Another feature of the transport investments is that it envisages a number of projects of a high value. This means for SOPT a lower number of projects than in several other OPs, which should in principle simplify the focus of monitoring indicators. Also several **output indicators would be highly sensitive to the development of just a few large projects**.

As regards result indicators, for some of them calculating robust data will imply not only the completed investment[15], but also waiting for **the end of a statistical year**, in order to be able to compare with a statistical baseline (e.g. value of time savings, reduction of fatal accidents etc). This means again that transport indicators are quite insensitive to short time periods.

In terms of communication and reporting, the lower sensitivity to time of SOPT indicators (see above) implies that the values of most indicators will be available for reporting only at larger time intervals, which in turn means an additional **difficulty on conveying information on the OP progress**. This is an issue not only with reporting indicators to the general public, but also to the European Commission.

Otherwise, the external communication has a slight advantage in the fact that both media and the general public have **good awareness on some of the typical transport infrastructure indicators** (e.g. length of new highways). At the same time, this creates additional pressure on reporting, as expectations related to the completion of transport infrastructure projects are quite high in the Romanian society.

[15] the overall investment needs to be completed, as results should not be calculated for each new segment of a road, for instance;

FIG. 5 SYNTHESIS OF THE ANALYSIS OF THE SYSTEM OF INDICATORS

OUTPUT INDICATORS								
LEVEL	Crt no	Indicators	Type[16]	Recommendation		Rationale		
						COVERAGE	BALANCE	MANAGEABILITY
KAI 1.1	1.	TEN-new motorways completed (km)	P	Replace	Use of indicator (2): *Length of new TEN-T roads - motorways*	-	-	the indicator is not defined broadly enough to allow processing/ measurement of total "new TEN-T roads"
	2.	Length of new TEN-T roads – motorways (km)	S	Keep	Set down a single position: *Length of new TEN-T roads (km)* - *motorways* - *bypasses*	▪ reflects more clear and corresponds to the core indicator (15) *new TEN-T roads* ; ▪ the indicator reflects the coverage of intervention related to construction of motorways and bypasses	to be correlated with indicator (1) in order to avoid the overlapping and to keep the system balance	the indicator definition allows processing/ measurement of total "new TEN-T roads"
	3.	Length of new TEN-T roads – bypasses (km)	S					
	*	Length of rehabilitated/ upgraded TEN-T roads - national roads (km)	*	Add	-	contributes to the calculation of core indicator (16) *reconstructed roads*	-	the indicator definition allows processing/ measurement of total "rehabilitated/ modernised roads"
KAI 1.2	4.	TEN-interoperable railway rehabilitated/upgraded (km)	P	Replace	Use of indicator (5): *Length of rehabilitated/ upgraded TEN-T railway (km)*	-		the indicator definition does not allow comparable communication/ reporting
	5.	Length of rehabilitated/upgraded TEN-T railway (km)	S	Keep	-	contributes to the calculation of core indicator (18)	to be correlated with indicator (4) in order to avoid the overlapping and to keep the system balance	the indicator definition does allow comparable communication/ reporting

[16] P=programme, S=supplementary

OUTPUT INDICATORS								
LEVEL	Crt no	Indicators	Type[16]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
KAI 1.3	6.	TEN-navigable waters fully open to navigation (km)		Replace	Use of indicator (8): *Length of TEN-T waterways open to navigation (km)- inland waters*			the indicator definition does not allow comparable communication/ reporting
	7.	Length of TEN-T waterways open to navigation (km)	S	Keep	-	-	to be correlated with indicator (6) in order to avoid the overlapping and to keep the system balance	the indicator definition does allow comparable communication/ reporting
KAI 2.1	8.	National roads rehabilitated	P	Replace	Use of indicator (9): *Length of rehabilitated/ upgraded(outside TEN-T) roads (km) - national roads*	the indicator reflects the coverage of intervention related to works for rehabilitation/ upgrading of national roads	-	the indicator is not defined broadly enough to allow processing/ measurement of total "rehabilitated/ modernised roads"
	9.	Length of rehabilitated/ upgraded roads (outside TEN-T) - national roads (km)	S	Keep	-	-	to be correlated with indicator (8) in order to avoid the overlapping and to keep the system balance	allows processing/ measurement of total of "rehabilitated/ modernised roads (outside) TEN-T"
	10.	Length of roads (outside TEN-T) rehabilitated/ upgraded – bypasses (km)	S	Remove	-	following the intervention the indicator does not measure the output of any activity financed	-	-

OUTPUT INDICATORS								
LEVEL	Crt no	Indicators	Type[16]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
	*	Length of new roads (outside TEN-T) (km) - bypasses - expressways - motorways	*	Add	-	-	contributes to the calculation of core indicator (14)	the indicator is defined broad enough to allow processing/ measurement, of total "new roads"
KAI 2.2	11.	Railway stations rehabilitated/upgraded (number)	P	Keep	-	-	-	-
	12.	Railway stations rehabilitated/ upgraded (number)	S	Remove	-	-	overlaps with indicator (11), its use become redundant	-
	13.	Railway bridges/tunnels rehabilitated (km)	P	Revise	Use of indicator: *Bridges/tunnels rehabilitated/ upgraded (km) – railways*			the indicator is not defined broad enough to allow processing/ measurement, within the SOP T
	*	Rolling stocks for passengers modernised - railways(number)	*	Add	-	following the intervention logic the indicator is required to measure the output of modernisation of rolling stocks for railway passenger transport	-	-
KAI 2.3	14.	Ports rehabilitated	S	Revise	Use of indicator: *Ports rehabilitated/ upgraded (number)* - *inland waters* - *maritime*	following the intervention logic the indicator is required to measure the output of maritime and river ports rehabilitation	-	the indicator is not defined broad enough to allow processing/ measurement within the SOP T

OUTPUT INDICATORS								
LEVEL	Crt no	Indicators	Type[16]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
KAI 2.4	15.	Airports rehabilitated/ upgraded (number)	P	Keep	-	-	-	-
KAI 3.1	16.	New/upgraded intermodal terminals (number)	P	Revise	Use of indicator: *New/upgraded intermodal infrastructure (number)*	the indicator partially reflects the coverage of modernisation of modal infrastructure, that comprises terminals and logistics centres	-	-
KAI 3.2	17.	Improved/ upgraded level crossings (number)	P	Revise	Use of indicator: *Level crossings improved/upgraded (number)* – *railways* – *national roads*	the indicator reflect the coverage of improvement of traffic safety across railway and road transport modes	-	the indicator is not defined broad enough to allow processing/ measurement within the SOP T
	18.	Railway level crossings – railways (number)	S	Remove	-	-	it overlaps with indicator (17), its use become redundant	-
	19.	Railway level crossings - national roads	S	Remove	-	-	it overlaps with indicator (17), its use become redundant	-
	*	Rail underpass/ overpass (number) – national roads		Add	-	following the intervention logic the indicator is required to measure the output of operations aiming to ensure traffic safety on roads intersecting railway lines	-	-
	20.	Km of linear villages protected	P	Remove	-	the indicator does not reflect the coverage of intervention related to	-	-

OUTPUT INDICATORS								
LEVEL	Crt no	Indicators	Type[16]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
						safety on national roads, namely it does not clarify that the protection of villages is ensured using interventions in roads and not interventions in other transport modes.		
	21.	Linear villages protected - national roads	S	Keep	-	the indicator reflects the coverage of intervention related to safety on national roads	-	
KAI 3.3	22.	Environment Strategy for Transport sector	P	Remove	-		-	the indicator is not defined broad enough to allow processing/ measurement and communication/ reporting the similar initiatives
	23.	Studies, analyses, reports, strategies - environmental protection	S	Keep	-	the indicator reflects the coverage of intervention related to management environmental system	-	the indicator is defined broad enough to allow processing/ measurement and communication/ reporting the similar initiatives
AP 4	24.	Cumulated number of training seminars	P	Remove	-	-	-	the indicator is not defined broad enough to allow processing/ measurement of training provided to various stakeholders
	25.	Staff of MA and beneficiaries having received training	P	Remove	-	-	-	the indicator is not defined broad enough to avoid double counting of

OUTPUT INDICATORS								
LEVEL	Crt no	Indicators	Type[16]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
								participants in training
	26.	Participant training days – beneficiaries	S	Keep	Set down a single position: *Participant training days* – *beneficiaries* – *managing authorities*	-	to be correlated with indicator (27) the in order to avoid overlapping and to keep the system balanced	the indicator is defined to avoid double counting of participants in training and allows the processing/ measurement and communication/ reporting the total number of participants training day
	27.	Participant training days - managing structures	S					
	28.	Meetings of relevant committees and working-groups	S	Keep	-	-	-	the indicator is defined broad enough to allow processing/ measurement and communication/ reporting the various meeting across PA 4
	29.	Studies, analysis, reports, strategies	S	Keep	-	-	-	the indicator is defined broad enough to allow processing/ measurement and communication/ reporting the various materials produced across SOP T and PA 4
	30.	Cumulated number of information materials and events	P	Remove	-	-	-	the indicator is too broad in order to provide meaningful information on the two communication type of action
	31.	Information and publicity materials	S	Keep	-	-	-	the indicator is defined broad enough to allow processing/ measurement and communication/

OUTPUT INDICATORS								
LEVEL	Crt no	Indicators	Type[16]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
								reporting the various information materials and events across PA 4
	32.	Communication and promotion events	S	Keep	-	-	-	the indicator is defined broad enough to allow processing/ measurement and communication/ reporting the various information materials and events across PA 4
	33.	Total number of website hits (number)	P	Revise	Use of indicator: *Website visits (number)*	the indicator relates to the effects of operations related to the development of information portal	-	the definition is not clear enough for the purpose of collection

RESULT INDICATORS								
LEVEL		Indicators	Type[17]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
KAI 1.1	1.	Time savings – road (minutes)	P	Remove	Use of indicator: *Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/ year)*	to ensure the correspondence with core indicator (20)	by replacing with indicator (2), its use become redundant	-
	2.	Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/ year)– road infrastructure	S	Keep	-	ensure the correspondence with core indicator (20)	-	-
	3.	TEN-T priority projects realised (%)	P	Remove	-	-	-	the indicator definition does not allow identification of related intervention. It is unknown if the indicator refers to road or rail etc. Infrastructure.
	4.	Transport emissions of greenhouse gases (CO2 equivalent) by mode (kt)	P	Revise	Use the indicator: *GHG emissions by transport mode: CO2 equivalent (kt)*	-	-	-
	5.	TEN-T priority projects realised - road	S	Keep	-	To keep in mind that the indicator refers to length	-	-

[17] P=programme, S=supplementary

RESULT INDICATORS								
LEVEL		Indicators	Type[17]	Recommendation		Rationale		
						COVERAGE	BALANCE	MANAGEABILITY
		infrastructure				of TEN-T infrastructure in total of TEN-T infrastructure to be completed in Romania		
	6.	Increase of passenger traffic (%)	S	Remove	-	the specific objective of SOP T is to encourage the use of rail, water and intermodal transport	-	-
KAI 1.1	7.	Increase of freight traffic and transit (%)	S	Remove	-	the specific objective of SOP T is to encourage the use of rail, water and intermodal transport	-	-
KAI 1.2	8.	Time savings – railway (minutes)	P	Remove	Use of indicator: *Value for time savings for transported passengers and freight stemming from new and rehabilitated railways (Euro/year)*	to ensure the correspondence with core indicator (20)	by replacing with indicator (9), its use become redundant	-
KAI 1.2	9.	Value for time savings for transported passengers and freight stemming from new and rehabilitated railways (Euro/year)	S	Keep		ensure the correspondence with core indicator (20)		
KAI 1.2	10.	TEN-T priority projects realised (%)	P	Remove	-	-	-	the indicator definition does not allow the identification of related intervention
	11.	TEN-T priority projects realised – railways (%)	S	Keep		To keep in mind that the indicator refers to length	-	-

RESULT INDICATORS								
LEVEL		Indicators	Type[17]	Recommendation		Rationale		
						COVERAGE	BALANCE	MANAGEABILITY
						of TEN-T infrastructure in total of TEN-T infrastructure to be completed in Romania		
	12.	Rail market share (%)	P	Keep		-	-	-
	13.	Railway transport market share (%)	S	Remove	–	-	overlaps with indicator (11), its use become redundant	-
KAI 1.2	14.	Increase of passenger traffic – railways (%)	S	Revise	Use the indicator: *Increase in passenger transport (passengers-km) - railways*	-	-	the measurement unit of the indicator is not appropriate for aggregation from project level.
KAI 1.2	15.	Increase of freight traffic and transit – railways (%)	S	Revise	Use the indicator: *Increase in freight transport (thou tonnes - km)-railways*	-	-	the measurement unit of the indicator is not appropriate for aggregation from project level.
KAI 1.3	16.	TEN-T priority projects realised (%)	P	Remove	-	-	-	the indicator definition does not allow the identification of related intervention
	17.	TEN-T priority projects completed - inland waterways (%)	S	Keep		To keep in mind that the indicator refers to length of TEN-T infrastructure in total of TEN-T infrastructure to be completed in Romania		
	18.	Inland freight traffic (million tonne – km)	P	Revise	Use the indicator: *Increase in freight transport (thou tonnes - km) – inland waters*			the indicator is not defined brought enough to allow the processing/ measurement and communication/ reporting by various mode

RESULT INDICATORS								
LEVEL		Indicators	Type[17]	Recommendation		Rationale		
						COVERAGE	BALANCE	MANAGEABILITY
								of transport identified across SOP T
	19.	Transport passengers on river and inland canals (millions)	P	Revise	Use the indicator: *Increase in passenger transport (passengers-km) – inland waters*			the indicator is not defined brought enough to allow the processing/ measurement and communication/ reporting by various mode of transport identified across SOP T
KAI 2.1	20.	Time savings (minutes)	S	Remove	Use of indicator: *Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/year)*	ensure the correspondence with the core indicators (20)	by replacing with indicator (21), its use become redundant	-
KAI 2.1	21.	Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/year)	S	Keep	-	ensure the correspondence with the core indicators (20)	-	-
KAI 2.1	22.	Number of projects completed	S	Remove	Use the indicator: *Projects in the transport sector (number)* at the level of priority axis	to ensure the correspondence with core indicator (13)	-	-
KAI 2.2	23.	Increase in railway passenger traffic (million passengers – km)	P	Revise	Use of indicator: *Increase in passenger transport (passengers –*	-	-	the indicator is not defined brought enough to allow the processing/ measurement

RESULT INDICATORS								
LEVEL		Indicators	Type[17]	Recommendation		Rationale		
						COVERAGE	BALANCE	MANAGEABILITY
					km)- railways			by various mode of transport identified across SOP T
KAI 2.2	24.	Increase of passenger traffic – railways (%)	S	Remove	-	-	to be correlated with indicator (20) in order to avoid the overlapping and to balance the system	-
KAI 2.3	25.	Transport passengers on river and inland canals (million)	P	Revise	Use the indicator: *Increase in passenger transport (passengers – km) - inland waters*			the indicator is not defined brought enough to allow the processing/ measurement and communication/ reporting by various mode of transport identified across SOP T
KAI 2.3	26.	Good conveyed in transit through TEN-T ports, out of which (million tons): -maritime -inland	P	Revise	Use the indicator: *Increase freight transport (thou tons/year) - maritime - inland waters*	-	-	the indicator is not defined broad enough to allow processing/ measurement, within the SOP T
KAI 2.3	27.	Increase of passenger traffic - ports (%)	S	Revise	Use the indicator: *Increase passengers transport (thou tons/year) - maritime - inland waters*	-	-	the indicator is not defined brought enough to allow the processing/ measurement and communication/ reporting by various mode of transport identified across SOP T
KAI	28.	Increase of freight traffic	S	Remove	-	-	-	Overlaps with indicator 26.

RESULT INDICATORS								
LEVEL		Indicators	Type[17]	Recommendation		Rationale		
						COVERAGE	BALANCE	MANAGEABILITY
2.3		and transit - ports (%)						
KAI 2.4	29.	Increase of passenger traffic – airports (%)	S	Revise	Use of indicator: *Increase passengers transport (passengers/year)– airports*	-	-	the measurement unit of the indicator is not appropriate for aggregation from project level.
KAI 2.4	30.	Increase of air passenger traffic (million passengers - km)	P	Remove	-	-	-	the indicator is not defined clear enough to allow the processing/ measurement and communication/ reporting by various mode of transport identified across SOP T
AP 3	*	Projects in the transport sector (number)	*	Add	-	corresponds to core indicator (13)	-	-
KAI 3.2	31.	Reduction in serious accidents (serious accidents/million passengers - car)	P	Revise	Use of indicator: *Reduction in serious accidents (serious accidents/million passengers - car) – national roads*	-	-	the indicator is not defined clear enough to allow the processing/ measurement and communication/ reporting by various mode of transport identified across SOP T
KAI 3.2	32.	Reduction in fatalities accidents (fatal accidents/million passengers – car)	P	Revise	Use of indicator: *Reduction in fatalities (fatal accidents/million passengers - car) – national roads*	-	-	the indicator is not defined clear enough to allow the processing/ measurement and communication/ reporting by various mode of transport identified across SOP T
KAI	33.	Reduction of serious	S	Remove	-	-	overlaps with indicator	-

RESULT INDICATORS								
LEVEL		Indicators	Type[17]	Recommendation		Rationale		
						COVERAGE	**BALANCE**	**MANAGEABILITY**
3.2		accidents - national roads (%)					(31), its use become redundant	
KAI 3.2	34.	Reduction of fatal accidents - national roads (%)	S	Remove	-	-	overlaps with indicator (32), its use become redundant	-
Kai 3.3	35.	Level of public awareness (%)	*	Add				

FIG. 6 RESULTS OF THE OVERALL ANALYSIS OF THE SYSTEM OF INDICATORS

PROGRAMME	1.	Projects in the transport sector (number)
	2.	Length of new roads (km)
	3.	Length of rehabilitated/ upgraded roads (km)
PA 1 Modernization and development of TEN-T priority axes aiming at sustainable transport system integrated with EU transport networks		**INPUT INDICATORS**
	1.	Projects in the transport sector (number)
		OUTPUT INDICATORS
	1.	Length of new TEN-T roads (km) - motorways - bypasses
	2.	Length of rehabilitated/ upgraded TEN – T roads - national roads (km)
	3.	Length of rehabilitated/upgraded TEN-T - railway (km)
	4.	Length of TEN-T waterways fully open to navigation – inland waters (km)
		RESULT INDICATORS
	1.	Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/ year)
	2.	Value for time savings for transported passengers and freight stemming from new and rehabilitated railways (Euro/year)
	3.	GHG emissions by transport mode: CO2 equivalent (kt)
	4.	TEN-T Priority Projects completed (%) - road infrastructure - railways - inland waters
	5.	Rail market share (%)
	4.	Increase in passengers transport (passengers - km) - railways - inland waters

	5.	Increase in freight transport (thou passengers - km) - railways - inland waters
PA 2. Modernization and development of the national transport infrastructure outside the TEN-T priority axes aiming at sustainable national transport system	**INPUT INDICATORS**	
	1.	Projects in the transport sector (number)
	OUTPUT INDICATORS	
	1.	Length of rehabilitated/ modernized (outside TEN-T) roads - national roads (km)
	2.	Length of new (outside TEN-T) roads (km) - bypasses - expressway - motorways
	3.	Railway stations rehabilitated/upgraded (number)
	4.	Bridges/tunnels rehabilitated/ upgraded - railways
	5.	Rolling stocks for passengers modernised – railways (number)
	6.	Ports rehabilitated/ upgraded (number) - inland waters - maritime
	7.	Airports rehabilitated/ upgraded (number)
	RESULT INDICATORS	
	1.	Value for time savings for transported passengers and freight stemming from new and rehabilitated roads (Euro/year)
	2.	Increase in freight transport (thou tone-km) - railways - maritime - inland water - airports
	3.	Increase in passengers transport (passengers-km) - railways - maritime - inland water - airports

PA 3. Modernization of transport sector aiming at higher degree of environmental protection, human health and passenger safety	**INPUT INDICATORS**	
	1.	Projects in the transport sector (number)
	OUTPUT INDICATORS	
	1.	New/modernized intermodal infrastructure (number)
	2.	Level crossings rehabilitated/ upgraded (number) - railway - national roads
	3.	Rail underpass/ overpass – national roads (number)
	4.	Studies, analyses, reports, strategies - environmental protection (number)
	RESULT INDICATORS	
	1.	Reduction in serious accidents – national roads (serious accidents/million passengers – car)
	2.	Reduction in fatalities (fatal accidents/million passengers – car)
	3.	Linear villages protected (km) - national roads
PA 3. Technical Assistance	**OUTPUT INDICATORS**	
	1.	Participant training days (number) - beneficiaries - managing authorities
	2.	Meetings of relevant committees and working-groups (number)
	3.	Studies, analysis, reports, strategies (number)
	4.	Information and publicity materials (number)
	5.	Communication and promotion events (number)
	RESULT INDICATORS	

	1.	Level of public awareness (%)
	2.	Website visits (number)

ENVIRONMENT IMPACT INDICATORS

PROGRAMME
PA1. Modernization and development of TEN-T priority axes aiming at sustainable transport system integrated with EU transport networks
A2. Modernization and development of the national transport infrastructure outside the TEN-T priority axes aiming at sustainable national transport system
PA 3. Modernisation of transport sector aiming t higher degree of environmental protection, human health and passenger safety

1.	NOx emissions (kt)
2.	SO2 emissions (kt)
3.	Volatile Organic Compounds -VOCs emissions (kt)
4.	Particulate Matters - PM10 emissions (kt)
5.	GHG emissions by mode: CO2 equivalent (kt)
6.	Land take by transport infrastructure (ha/year)
7.	People exposed to high level of traffic noise (number of persons)
8.	People exposed to air quality levels above standard values (number of persons)
9.	Length of transport infrastructure inside designed areas *(km)
10.	Proximity of transport infrastructure to the designed areas (m)
11.	Number of affected designed areas (km2)
12.	Reduction of accidents causing soil pollution (number)
13.	Reduction of accidents causing water pollution (number)

* designed areas: Natura 2000, archaeological and cultural areas

CONTEXT INDICATORS

Serious traffic accidents (number/year)
Fatalities caused by traffic accidents (number/year)
Share of goods transport, by mode of transport (%)

Share of passenger transport, by mode of transport (%)
Passenger transport performance, by mode of transport (mil passengers – km)
Passengers carried, by mode of transport (thou passengers/year)
Goods transport performance, by mode of transport (mil tonnes – km)
Goods carried, by mode of transport (thou tonnes/year)
Density of roads network (km/ km2)
Density of higher class roads (km/thou inhabitants)
Transport sector in GDP formation (%)
Share of the individual modes of transport in CO2 (kt)

3. ANALYSIS OF THE INDIVIDUAL INDICATORS

The analysis of the individual indicators consisted of the examination of the output and result indicators **upshot from the analysis at system level**. Indicators that were rejected after the analysis of the system were considered inherently flawed so as to make their individual analysis unnecessary. The reasons for their rejection, as well as suggestions for their replacements (where appropriate) were presented in the previous section.

The list of indicators subject to the current individual analysis includes the original programme indicators and supplementary indicators, introduced as an update through the common effort of MA OP-T and ACIS-ECU during the implementation so far. As no impact or context indicators are included in the current system, such categories are not covered by the analysis in the case of OP-T.

Although OP-Transport also lacks officially assigned input indicators, the analysis takes into account the financial allocation at the level of KAI/PA/OP, as input indicator (taking into consideration EC-WD2 guidelines). At the level of OP-T, this is well established and the budget committed to each project is clearly defined as well.

This list of output and result indicators was assessed against the four criteria for quality indicators as set out in the ToR, based on the DG Regional Policy Guidelines namely: "relevance", "sensitivity", "availability" and "cost". Each indicator will be marked wit h "+" and "-", for each of the criteria.

Relevance: (+) little relevance; (++) relevant

Sensitivity: (+) low sensitivity (the indicator has very limited response when changes occur in the variable to be measured and can be influenced by a lot of external factors); (++) sensitive (the indicator fully responsive to the changes in the variable to be measured and is not influenced by external factors).

Availability: (+) limited availability (it is difficult to collect/update regularly, due to calculation method, source etc.) (++) available (does not pose any difficulties for collection/update)

Cost: (+) high costs (specific studies, surveys at MA/ACIS etc.), (++) low cost (no additional costs for collection, other than regular reporting requirements and input into the electronic system)

Comments have been made in relation to each of the above issues. The analysis of the individual indicators output and result indicators of SOPT can be found in **ANNEX II.**

NOTE: All output and result indicators should be considered as resulting from the project/intervention for which they are employed for monitoring. For example, the "Freight traffic and transit" should be interpreted as "Freight traffic and transit as a result of the project/intervention" and "Increase in freight traffic and transit as a result of the project/intervention".

- There are indicators that have little sensitivity: for example, indicators like *"Reduction of serious accidents"* , which can be influenced by a large number of external factors and do have the capacity to reflect the changes in the variable to be measured.

Overall, the individual indicators of SOP Transport have scored relatively high *for the criteria of availability and cost. In terms of relevance and sensitivity, improvements are necessary, so as to* increase their suitability.

4. SUMMARY OF RECOMMENDATIONS

NEEDS ASSESSMENT

1. In respect to the appropriateness and the actual use of indicators, the knowledge base at the level of the MA is currently limited; **therefore, it is recommended that training and instructions specifically designed for working with indicators be provided through additional TA.**
2. The survey has indicated the need for procedures dedicated to working with indicators. An implicit modus-operandi is currently functioning and the activities related to collecting, measuring, processing and monitoring of indicators are partially covered by other procedures. Nonetheless, this omission perpetrates a vague allocation of responsibilities. **It is advisable to have dedicated procedures for working with indicators. These procedures should have a common approach across OPs and should be done under ACSI coordination.**
3. In order to have a complete and accurate image of the progress of the implementation, not only for Technical Assistance, but for all types of interventions, both quantitative and qualitative information is needed. **It is suggested that the Evaluation Plan for SOPT include thematic evaluations for assessing the quality of the interventions, such as the value added of the OP on increasing accessibility, the effectiveness of the interventions etc.**
4. There is a clear need for having a definitive list agreed with the European Commission. **Therefore, it is highly advisable that the process of negotiations and defining a final list of indicators for SOP Transport be given priority.**
5. As implementation will progress, more knowledge will be achieved, on all tiers – performance, capacity of beneficiaries, and appropriateness of indicators. The feedback provided by the use of indicator systems should be used for continuous improvement both in terms of policy but also in terms of the indicator system itself. **It is recommended that MA SOPT and all relevant stakeholders be actively involved in the process of improving the system of indicators. Also, if the need is identified, the MA should be encouraged to establish and monitor its own set of (sub)indicators.**
6. There is a lack of correlation with other OPs (ROP, SOP HRD and OPTA, for example), for cross-cutting indicators, such as "number of participants", "length of road" etc. **It is suggested that a common approach be enforced and observed by ACIS in coordination with the respective MAs.**

1. It is advisable that **new output and result indicators be introduced to fill the gaps in coverage.** Indicators could be generated for all by an interventions envisaged. However, it is not practical to attach indicators to all of them. It is preferable to concentrate on developing indicators for the more prominent activities only.
2. Given that the European Commission underlines the utility of context indicators and that the need for this type of indicators has precisely resulted from the analysis performed, it is recommended that **context indicators be introduced and properly defined** for SOP T. A list is presented in the following tables.
3. As regards matching the core indicators requested by the EC, it is advisable to follow the **existing supplementary indicators, which should be "empowered" as programme indicators.**
4. Balance should also be improved, by **reducing the ratio between output and result indicators**.
5. Manageability should be improved, by **officially adopting the action categories and increasing the use of the equivalent SMIS function**. Also for manageability reasons, consistency should be observed in defining (especially labelling) indicators.
6. For the easiness of implementing the recommendations presented under *Fig. 6 Results of the Overall analysis of the system of indicators and Fig. 7 Final recommended list of indicators OP-Transport in SMIS*

LIST OF INDICATORS USED AS PARAMETERS OF SMIS

The recommended list of indicators for OP Transport is built based on the findings, conclusions and recommendations of all the previous chapters and aims at bringing improvements both at the level of the system and at the level of individual indicators.

FIG. 8 FINAL RECOMMENDED LIST OF INDICATORS OP-TRANSPORT IN SMIS

Crt. No.	SMIS Code	Indicator	UM	SMIS Code	Action Category	Type	Core indicator[18]
OUTPUT INDICATORS							
1.	500	Length of new roads	Km	500	Motorways	Composed (1) = (2) + (3)	(14)
				502	By-passes		
				*	Expressway		
2.	501	Length of new TEN-T roads	Km	500	Motorways	Simple	(15)
				502	By-passes		
3.	515	Length of new (outside TEN-T) roads	Km	500	Motorways	Simple	-
				502	By-passes		
				*	Expressway		
4.	502	Length of rehabilitated/ upgraded roads	Km	501	National roads	Composed (4) = (5) + (6)	(16)
5.	503	Length of rehabilitated/ upgraded TEN-T roads	Km	501	National roads	Simple	(16)
6.	516	Length of rehabilitated/ upgraded (outside TEN-T) roads	Km	501	National roads	Simple	(16)
7.	508	Length of rehabilitated/upgraded TEN-T railway	km	503	Railways	Simple	(18), (19)
8.	512	Length of TEN –T waterways fully open to navigation	km	504	Inland waters	Simple	-
9.	*	New/modernised intermodal infrastructure	No	*	Intermodal infrastructure	Simple	-
10.	504	Level crossing rehabilitated/ upgraded	No	501	National roads	Simple	-
				503	Railways		
11.	*	Rail underpass/ overpass	No	*	National roads	Simple	-
12.	509	Ports rehabilitated/ upgraded	No	*	Inland waters	Simple	-
				*	Maritime		
13.	510	Railway stations rehabilitated/ upgraded	No	503	Railways	Simple	-

[18] Cf. Documentului de lucru nr. 7

14.	*	Bridges/tunnels rehabilitated/upgraded	No	*	Railways	Simple	-
15.	514	Airports rehabilitated/ upgraded (number)	No	506	Airports	Simple	-
16.	*	Rolling stocks for passengers modernised	No	503	Railways	Simple	-
17.		Linear villages protected	km		National roads	Simple	
18.	520	Value for time savings for transported passengers and freight stemming from new and reconstructed railroads	Euro/ year		Railways	Simple	21
19.	521	Value for time savings for transported passengers and freight stemming from new and rehabilitated roads	Euro/ year	500	Motorways	Simple	20
				502	By-passes		
				*	Expressway		
				501	National roads		
20.	518	Increase in passenger transport	Pass-km	503	Railways	Simple	-
				504	Inland waters		
				*	Maritime		
				506	Airports		
21.	519	Increase in freight transport	Thou tones - km	503	Railways	Simple	-
				504	Inland waters		
				*	Maritime		
				506	Airports		
22.	*	TEN-T priority projects completed	%	508	Road infrastructure	Simple	
			%	503	Railways	Simple	
			%	504	Inland waters	Simple	
23.	*	Rail market share	%	503	Railways	Simple	
24.	700	Studies, analyses, reports, strategies	No	509	Environmental protection	Simple	
				700	Technical assistance		
25.	506	Reduction in serious accidents	Serious accidents/ million passengers -car	501	National roads	Simple	
26.	507	Reduction in fatalities	Fatal accidents/ million passengers -car	501	National roads	Simple	
27.	704	Participant training days	No	700	Technical assistance	Composed (24) =	

						(25)+ (26)	
28.	705	Participant training days - beneficiaries	No	700	Technical assistance	Simple	
29.	706	Participant training days – managing authorities	No	700	Technical assistance	Simple	
30.	703	Meetings of relevant committees and working groups	No	700	Technical assistance		
31.	709	Information and publicity materials	No	700	Technical assistance		
32.	708	Communication and promotion events	No	700	Technical assistance		
33.	710	Website visits	No	700	Technical assistance		
34.	716	Level of public awareness	%	700	Technical assistance		
35.	*	NOx emissions (kt)	kt	*	*	Simple	
36.	*	SO2 emissions (kt)	kt	*	*	Simple	
37.	*	Volatile Organic Compounds -VOCs emissions (kt)	kt	*	*	Simple	
38.	*	Particulate Matters - PM10 emissions (kt)	kt	*	*	Simple	
39.	*	GHG emissions by transport mode> CO2 equivalent	kt	*	*	Simple	
40.	*	Land take by transport infrastructure	ha/year	*	*	Simple	
41.	*	People exposed to high level of traffic noise	number of persons	*	*	Simple	
42.	*	People exposed to air quality levels above standard values	number of persons	*	*	Simple	
43.	*	Length of transport infrastructure inside designed areas	km	*	*	Simple	
44.	*	Proximity of transport infrastructure to the designed areas	m	*	*	Simple	
45.	*	Number of affected designed areas	km2	*	*	Simple	
46	*	Reduction of accidents causing soil pollution	number	*	*	Simple	
47.	*	Reduction of accidents causing water pollution	number	*	*	Simple	

ANNEXES

ANNEX I ANALYSIS OF OUTPUT INDIVIDUAL INDICATORS
ANNEX II ANALYSIS OF RESULT INDIVIDUAL INDICATORS
ANNEX III ANALYSIS OF ENVIRONMNETAL INDICATORS
ANNEX IV OVERVIEW OF CONTEXT INDICATORS IN OTHER OPERATIONAL PROGRAMMES