

# SUMMARY

## Methodology and data platform for evaluation of impacts of Operation Programme Transport on the environment

Funded by Operational Programme Transport technical assistance (priority axis 7 – Cohesion Fund).

Contracting Authority: Czech Republic – Ministry of Transport  
EU Funds Department (O 430)

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The Operational Programme Transport (OPD) is a document implementing development priorities of the Czech Republic in the field of transport in 2007 – 2013 which are co-funded from structural funds (SF) – namely from the European Regional Development Fund (ERDF) and Cohesion Fund (FS).

There are six priority axes which help to implement construction and modernization of transport infrastructure that has a crucial importance for Czech economy. The attention is predominantly paid to the construction and modernization of the TEN-T network and linked networks, modernization of lower classes road network, transport quality improvement, modern ways of controlling and shaping progressive transport technologies. In accordance with the Council Regulation (EC) No. 1083/2006 laying down general provisions on the European Regional Development Fund, the European Social Fund, and the Cohesion Fund, and on repeal of the Regulation (EC) No. 1260/1999 (hereinafter “General Regulation”) every member country is obliged to measure priority axes goals with the use of indicators. In its working document no. 6 (Indicators for monitoring and evaluation) the European Commission produced a list of so-called core indicators. Ministry of Transport, being the steering body, included the relevant indicators in OPD and complemented them with other indicators for monitoring and evaluating impacts on the environment. However, a number of indicators have not yet been sufficiently methodologically specified within the programme and thus cannot be monitored as a standard procedure. At the time of approving OPD, the initial system setting of starting values was only specified for the indicators from which possible relevant data could be obtained. To determine other starting and target values for monitoring OPD goals background data needed to be collected.

In order to fulfil the requirements of General Regulation, Ministry of Transport commissioned an order to provide definitions of individual indicators (methodological

specification), their comprehensiveness, transparency, required data availability, and definition of measurement methods of OP Transport impact on the environment, including the setting of starting and target indicator values. At the same time, the concern was an assessment of a suitability of use respectively measurability of indicators and environmental criteria defined within the document of Evaluation of impacts of The Operational Programme Transport for 2007 – 2013 on the environment (SEA OPD).

The presented report describes a systematic set of activities which meet the assignment of the project and are divided into the following points:

- a) Determination of the evaluation method (methodology) of the impact of implemented measures in the field of transport with the use of OPD impact indicators – specification of types and scope of environmental indicators,
- b) Determination of definitions, calculation formulas, and frequency of monitoring of selected indicators within the programme,
- c) Determination and specification of starting and target values of selected programme indicators,
- d) Methodological procedure for evaluating of implemented measures in the field of transport with the use of impact indicators and evaluating through environmental indicators within the project.

**a) Determination of the evaluation method (methodology) of the impact of implemented measures in the field of transport with the use of OPD impact indicators – specification of types and scope of environmental indicators.**

The objective was to design a unified set out of the starting sets of indicators, in order to monitor OPD implementation and its impact on the environment including a justification of individual indicator selection. The indicator were selected on the basis of the contractual documents and implied requirements of the contracting authority, starting sets of indicators provided by the contracting authority, selected methodological approaches, and regular discussions with the contracting authority.

When selecting the indicators, the following goals of monitoring were taken in the account:

- Measuring impacts of OPD implementation on the environment,
- Measuring quality of projects supported within OPD in the viewpoint of impacts on the environment,
- Finding effects of OPD on meeting relevant goals of the environment protection.

Based on the contracting authority requirements for outcomes and on the existing materials, several methodological approaches for the resulting set of indicators were discussed, which was further specified on the basis of available materials and information on the actual implementation of individual projects. Two methodological approaches were selected, respectively their combinations:

- “Top-down” approach
- “Bottom up” approach

Based on a broad discussion of the research team (including external experts) on the outcomes of both methodological principles, a resulting set of indicators for individual monitored levels was designed which describes:

- indicators for evaluating OPD as a whole,
- indicators for evaluating priority axes,
- indicators (criteria) for project level,
- indicators for horizontal field of the environment.

In total, 10 indicators were determined, out of which 4 evaluate the impact of the whole OPD and other 6 indicators evaluating individual priority axes in combination with the indicators evaluating the whole OPD.

#### **b) Determination of definitions, calculation formulas, and frequency of monitoring of selected indicators within the programme.**

For individual indicators, the separate Appendix 1 of the final report contains comprehensive and detailed definitions, calculation methods, evaluation methods, data sources, and legislation concerning the indicators.

#### **c) Determination and specification of starting and target values of selected programme indicators.**

The starting and target values were determined for the indicators monitoring environmental impacts of OPD as a whole. After a discussion of the research team and the contracting authority the initial year for all indicators and subsequent evaluation of OPD impacts on the environment was set the year 2006. For this year, specific values were calculated with the use of methodologies corresponding with different indicators. The monitoring of meeting OPD indicators target values is designed for 2015 and 2020. The year 2015 was chosen as a year when all approved projects implementation will be in progress and thus first impacts of OPD implementation on the environment could be evaluated. The year 2020 was chosen for its optimum time after the implementation of the last projects from OPD and therefore possible evaluation of all effects OPD may bring along. As a support for the subsequent monitoring section 10 of the Act no. 100/2001 Sb., on evaluating impacts on the environment and on changes of some corresponding acts (Act on evaluating impacts on the environment) as amended by Act no. 93/2004 Sb., no. 163/2006 Sb., no. 186/2006 Sb., no. 216/2007 Sb. and no. 124/2008 Sb.

#### **Emissions of greenhouse gases from transport (tonnes of CO<sub>2</sub> eq./year)**

In order to provide complete evaluation of a designed indicator, the emission values of CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> needs to be calculated and converted into CO<sub>2</sub> equivalent. Emission values for the starting year 2006 are specified for individual transport modes for the whole Czech Republic (19 353 247 tonnes in total for transport sector). To determine the target values of CO<sub>2</sub> equivalent, initially, we considered the European commitment concerning emission reduction of CO<sub>2</sub>, namely the principle of 20/20/20 (i.e. reduction of greenhouse gases emission by 2020 by 20% and replace 20% of fossil fuels by renewable resources). After discussion of the research team it was concluded that if we allow for a certain potential of the CO<sub>2</sub> equivalent reduction through OPD implementation (improved traffic flow, moving transport out of urban areas), the emission will be reduced by 0.7% (19 217 774 tonnes) in 2015 and by 2% (18 966 182 tonnes) in 2020.

### **Emissions of greenhouse gases from transport in the capital of Prague (tonnes of CO<sub>2</sub> per a Prague inhabitant/year)**

To calculate CO<sub>2</sub> equivalent the same method was used as to calculate the indicator of “**Emissions of greenhouse gases from transport**” and the calculated emission was divided by the number of Prague population - 1 176 116 – mean population in 2006. To determine the target for 2015 and 2020 is impossible within the study due to unavailability of basic input data. Nevertheless, in the report researches designed a method and specified some data which need to be taken into account when calculating the target values.

### **Emissions of NO<sub>x</sub> from transport (tonnes/year)**

The production of emissions of nitrogen oxides reached 97.27 thousand tonnes in 2006, out of which 89.97 thousand tonnes was produced by road transport, 2.8 thousand tonnes by rail transport, 0.2 thousand tonnes by inland waterways transport, and 3.98 thousand tonnes by air transport. The prognosis of NO<sub>x</sub> emissions from transport depends on economic development in the Czech Republic, which is directly reflected in transport – fuel consumption, vehicle fleet renewal, changes of length of modal split, etc. In the following time period, a substantial reduction of emission production is expected based on the adopted measures which are to reduce NO<sub>x</sub> production. The production is to be reduced by 27% in 2015 (71 thousand tonnes) and 29% in 2020 (69 thousand tonnes). In both cases the percentage reduction refers to 2006. The NO<sub>x</sub> emission reduction may be explained by the implementation of OPD only in case of rail and waterways transport, where NO<sub>x</sub> will be reduced as the effect of the implementation of projects within corresponding priority axes (new modern boat and ship engines, electrification of railways, improved traffic flow of diesel trains). The reduction in road transport is not only caused by OPD implementation, but also by vehicle fleet renewal for new, less harmful, vehicles.

### **Number of inhabitants exposed to excessive noise from transport (before and after OPD implementation)**

For the starting year 2006, data from strategic noise mapping, road action plans administrated by regions, various noise studies of smaller areas, results of nationwide traffic census on roads and motorways of the Czech Republic, and knowledge of at least approximate population distribution were used to determine the number of inhabitants exposed to excessive noise from transport. Based on perspective traffic growth coefficients and using all the above mentioned input data, approximate volumes can be predicted in 2015 and 2020, which will be reflected in the growth of transport and thus to higher noise levels. These parameters were used to determine very rough estimations of the number of people living in areas of excessive noise levels for the time period of 2015 and 2020.

### **d) Methodological procedure for evaluating of implemented measures in the field of transport with the use of impact indicators and evaluating through environmental indicators within the project.**

The methodological procedure provides project researchers (as well as evaluators) with a manual how to proceed and evaluate the project impact on the environment in the context of current problems caused by transport constructions. The expected project impact in selected areas of the environment and subsequent quantification of the impact with the use of selected indicators can be evaluated within this procedure.

The evaluation of environmental impacts by projects implemented within OPD needs to be executed in the national level with the use of technical and administration indicators of the environment as early as with the project selection procedure, while the negative aspects of road constructions are dealt within legislation processes (EIA, statutory requirements, technical standards, etc.) This mentioned methodological procedure will help applicants to distinguish which implementations have positive or negative impacts on individual elements of the environment. Thus, the applicants would be able to find phenomena which are unimportant or irrelevant for the project, or in contrast phenomena which need to be monitored and quantified with the use of designed indicators.

## **Evaluation**

This presented report specifies the method of evaluating impacts of implemented OPD projects on the environment, specifies selecting indicators on the basis of their relevance and ability to collect objective data, identifies target values reached as a consequence of OPD projects implementation, and designs a monitoring system.