Transport Sector Strategies, 2nd Phase

The Medium-Term Plan of Transport Infrastructure Development with a Long-Term Outlook

Summary Document

(Final version)

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List of terms and abbreviations used

NTC	National Traffic Census
CBA	Cost-Benefit Analysis
CSHS	The Czech System of Road Evaluation
CÚ	Price level
ČSÚ	Czech Statistic Office
Horizon S / M / L	Time horizon short-term/mid-term/long-term
D+R	Motorways and expressways
TI	Transport Infrastructure
DSP	Documentation for Building Permit
TSS2	Transport Sector Strategies, 2nd Phase
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
IEF	Economic Efficiency Indicator
IC (investment costs)	Investment costs
IT JŘ	Integrated fixed interval schedule
IVI	Investment utilization indicator - substitution of the 3rd pillar for the possibility of comparison of suggestions from the economic point of view
MCA	Multi-criteria analysis
MoF	Ministry of Finance
MoT	Ministry of Transport
OaM (operation and maintenance)	Costs of the infrastructure maintenance and repairs
ON	Other costs
PP	Clearance profile
PÚR	Czech Republic's Territorial development policy 2008, in the wording approved by Government Decree No. 929 of 20 July 2009, incl. Related documents
FC/HST	Fast connections/High speed tracks
RMD	Road and Motorway Directorate of the Czech Republic, allowance organisation of the Ministry of Transport
WD	Waterways Directorate of the Czech Republic, organisational body of the State
SEA	Strategic Environmental Assessment
SFTI	State Fund of Transport Infrastructure
RIA	Railway Infrastructure Administration, state organisation pursuant to Act no. 77/2002 Coll., as amended
TEN-T	Trans-European Transport Network
TSI CCS	Technical specifications for interoperability of the Management and Resourcing Subsystem
TSI PRM	Technical specifications secured for interoperability regarding persons with limited motion and orientation abilities
TTZ	Track loading class
LOS	Level of Service (CSN 73 6101) - LOS A, B, C, D, E
UV	Utility vehicle
MMA	Multilevel multi-criteria analysis
VOC	Vehicle operating costs

VTTS (costs of time)	Value of travel time savings
zCBA	Simplified Cost-Benefit Analysis
ZÚR	Territorial Development Policy Document

Measure	An individual proposed activity to maintain and develop the transport infrastructure
Cluster	A coherent transport route with a set of interrelated measures implemented on it. Clusters will be the subject-matter of transport modelling and multilevel multi-criteria evaluation (MMA). The clusters are created separately for projects and separately for suggestions, namely for the reason of different evaluation of these measure types in the multi-criteria evaluation.
Project	A designed infrastructure measure for which there is detailed information available, e.g. from documents that have already been drawn up. The projects are planned to be implemented especially in a mid-term horizon (in years 2014 to 2020, with an overlap to 2023)
Suggestion	An unspecified infrastructure measure which may usually be expected to be implemented no sooner than in a long-term horizon (e.g. in the area of technical parameters, investment costs, etc.) Project preparation is planned for suggestions in the mid-term horizon.
General group of packages	The basic classification of measures according to the planned or the existing transport infrastructure and according to their ownership (A, B, C ... E)
Categories of measure packages	A set of measure groups of a similar type (A1, A2... , B1, B2... etc.)
Unquestionable projects	Projects in progress the construction of which could not be stopped without impacts on efficiency of the projects or which are not acceptable to be stopped considering impacts of such stoppage on transport, or constructions that have been contracted for and any failure of their launching could lead to similarly serious consequences.
Not evaluable projects	These are such projects that cannot be evaluated with a strategic transport model (road intersections, railway junctions, etc.)
Multilevel multi-criteria analysis (MMA)	Methodology for cluster assessment consisting of 3 evaluation pillars.
Pillar of evaluation	An aspect of evaluation in the multilevel multi-criteria analysis (MMA)
Transport and social pillar	The first pillar of MMA assesses the reasons for the implementation of measures by MCA
Territorial and environmental pillar	The second pillar of MMA evaluates the expected obstacles and negative impacts of measures implementation with MCA
zCBA	Simplified economic evaluation (simplified benefit-cost analysis) is the third pillar of MMA
Principle of 3P	Objective of the assessment is to identify infrastructure measures fulfilling the principle of 3P - Necessity, Feasibility and Throughput
Weaknesses in transport infrastructure	The network sections with occurrence of defects preventing from effective utilization of the given infrastructure (e.g. insufficient capacity, accident location, low journey speed and comfort). Absence of network sections (missing sections) also belongs to the weaknesses.

TEN-T Network	Network defined in the Proposal for a Regulation on Union Guidelines for the Development of the Trans-European Transport Network as amended by "general approach of the Council of 22 March 2012" (document ST 8047/12) and in the map annexes to this document (ST8047-AD14 and ST8047-AD15)[1]
Core TEN-T Network	Core Network resources the transport infrastructure defined in Chapter III of the Proposal for a Regulation on Union Guidelines for the Development of the Trans-European Transport Network
Comprehensive TEN-T Network	Comprehensive Network resources the transport infrastructure defined in Chapter II of the Proposal for a Regulation on Union Guidelines for the Development of the Trans-European Transport Network
Types of Class I roads	Classification of Class I roads into five groups according to their importance in the transport system determined by the aspects mentioned in Chapter 5.2 of Report 6.1
Preferential sub-criterion	Sub-criteria preferring railway and waterway transport in MCA of the first pillar.
Multiplier α	Value of multiple of the resulting score evaluation of the preferential mode cluster (railway and waterway transport)
Gain of points	Weighted sum of criteria values of the given cluster in individual criteria.
Gain of points for determination of the evaluation mark level	Recalculated gain of points used for unification of the results of all three pillars.
Point scale	It is used for uniform classification of gains of points of individual projects identically in all pillars (point score 10 the best, 1 the weakest)
Weighted sum of point scores	Weighted sum of point scores (1-10) of individual pillars the cluster being evaluated has gained.
Level of evaluation mark	The evaluation results in individual pillars are classified in the particular evaluation mark levels A, B, C, D, E (A= the best)
Rating zone	Based on the cluster evaluation in particular pillars (evaluation mark levels A-B-C-D-E) we can draw up mathematically, using their combination, in total 125 rating zones, in which the particular clusters will be placed based on their gains of points (1 corresponds to the transport and socially beneficial project, economically efficient without environmental risks – 125 resources a project not beneficial, economically inefficient with great environmental risks).
Economic efficiency indicator	An outcome of zCBA. The IEF indicator shows whether benefits from a project determined by means of the discounted cost/benefit ratio are higher than the costs of its life cycle.
Investment utilization indicator	It substitutes the 3rd pillar so that it would be possible to compare suggestions from the economic point of view. The IVI of a cluster determines the ratio between investment costs and the average traffic performance on a cluster.

[1] Adopted in December 2013 as Regulation No. 1315/2013.

1 Introduction

Transport Sector Strategies 2nd Phase (further on TSS2 or Transport Strategies) define the principles for the provision of effective and high quality transport infrastructure operation. They include the principles for the stipulation of the priorities of development projects being prepared within the scope of the financial framework. The document represents a basic sector concept of the Ministry of Transport formulating priorities and objectives in the area of transport and transport infrastructure development in the medium-term horizon of the year 2020, and in general features, also in the long-term horizon up to the year 2050. Main reasons for drafting thereof are particularly:

- At European level: requirement to elaborate an umbrella strategic sector document (in form of “complex national transport plan) represents one of the ex-ante conditionality for gaining financial resources from the European Union funds in the years 2014 to 2020,
- At national level: absence of a valid concept of gradual development of transport infrastructure in individual transport modes.

The global objective of the Transport Strategies is to produce a stable framework for planning of sustainable development of the transport infrastructure.

Objectives of implementation of the process of Transport Strategies:

- Securing stable financial resources
- Securing maintenance, repairs and reconstructions
- Achievement of a network of secure infrastructure with minimal environmental influences and with the respect to the transport demand.
- Defining preferred projects of transport infrastructure development
- Tool for emergency risk management

Document follows from priorities of the national policy in the area of transport that are contained in the **Transport Policy of CR** approved by Government Decree No. 449 of 12 June 2013, including the SEA concurring opinion (ref.no. 15412/ENV/13). The Transport Policy of the Czech Republic is an umbrella conceptual document of the Ministry of Transport, which is publicly available at http://www.mdcr.cz/cs/Strategie/. The Transport Policy of CR presumes that individual follow-up strategy will be developed for individual constituent areas that have to be dealt with in more detail.

For the area of securing sustainability and development of transport infrastructure this is Transport Sector Strategies that meet the role of such follow-up strategy. This document determines priorities as regards securing sustainability of the existing transport infrastructure and defines the approach to the priorities of preparation and subsequent implementation of transport infrastructure with regard to the situation and main problems of transport in the

CR including international obligations and cross-border connections. TSS2 also represent a key document for individual transport sector investment organizations which secure preparation and implementation of constructions. The document also serves as a basis for preparation of other conceptual materials of the Ministry of Transport dealing with the issue of transport infrastructure.

Traffic as such has negative impacts on the environment and public health. The impacts may be partially eliminated by relocating a part of traffic outside the areas that are most exposed to noise and emissions. However, in many cases, it is the most affected areas that at the same time generate considerable demand for transport or, in other words, are a significant origin and destination of transport in a given area. They are especially large agglomerations.

Development of transport infrastructure means better chances for realization of traffic, which means that the risk of further potential growth in negative impacts may not be fully excluded. Nevertheless, the infrastructure itself is not what influences the burden on the environment and public health most. The biggest impact is generated when traffic is realized using the transport infrastructure.

Apart from development of Transport Sector Strategies, the Transport Policy of CR therefore also assumes that **the whole range of individual mutually closely interconnected follow-up strategic documents** will be drawn up that will focus on the potential of further decreasing of impacts of traffic itself on the environment.

In this respect, the following must be primarily mentioned:

- **National Action Plan on Clean Mobility,** the objective of which is to set a conceptual approach leading to efficient deployment of new technologies in car drive systems so that the positive trend of past years would be further supported and unit emission per unit car-kilometres would be further decreased (under preparation).
- **Public Transport Conception**, the objective of which is especially to secure long-term financial sustainability and interconnection of the system of public transport ordering on the basis of the Public Transport Plan developed pursuant to Act No. 194/2010 Coll., on public services in passenger transport (act implementing the Regulation 1370/2007/EC). Due to a fact that dimensioning of infrastructure is closely connected with the extent of transport a linkage between these two planning process is a key issue for the identification of the infrastructure measures. This issue is described in detail in the chapter 2.4.
- **The Strategy of Support to Logistics from Public Sources,** the objective of which is to set the rules for financial support for development of multimodal transport systems with the objective to utilize as much as possible advantages of all types of transport in their combination. The document has already been drawn up, and the programme itself has been under preparation now and ways are sought to meet its financial requirements, including utilization of the EU sources (already approved, the programme for funding is now under preparation).
- **Charging of the operation and the internalization of externalities – the scope of the network subject to charging constitutes a considerable impulse for a change of the traffic flows with a possible substantial**

impact on the environment (both positive and negative impacts are possible).

Further follow-up strategic documents towards the implementation of the objectives of the Transport Policy of the Czech Republic are as follows:

- National Road Safety Strategy 2011-2020 (already approved)
- Action plan for ITS deployment in the Czech Republic
- Preparation of construction of high-speed lines (under preparation, see chapter 61.1.5)
- Air Transport Conception
- Navigation 2020 (under preparation)
- National Space Plan
- National Cycling Strategy

The Horizontal and vertical interconnection between these follow-up strategic documents (including timing) is described in the scheme in Annex S1. Any update of individual document (after its approval) automatically becomes the background for further update of the other follow-up documents. This is the way how the up-to-date interaction between individual elaborated documents is ensured. In case of conceptions where assessment of the impacts on the environment (SEA) is required, such assessment will be carry out separately.

It is very difficult to prevent demand for transport. In addition to that, artificial restrictions would have a very negative impact on the macroeconomic situation and the international competitiveness of the CR. Therefore it is necessary **to perceive the above mentioned follow-up strategy of the Transport Policy as absolutely essential for the possibility of prospective reductions of transport impacts on the environment and public health.**

At the same time, it is true that all follow-up strategic documents influence one another and when they are updated or a respective conception is developed, principles are taken over from all the other documents, which in result ensures their mutual interconnection.

Transport Sector Strategies apply a conceptual approach to sustainability securing and transport infrastructure development issue at international, national and regional level. This approach is applied through three main pillars:

- Preparation of **multimodal transport model** (future traffic flows prediction in different transport areas),
- **Identification (summary) of measures on transport infrastructure** solving identified needs in the medium and long term horizon including a **summary of individual measures financial needs**,
- **Analysis of potential financial resources for infrastructure projects investment** and connection of these resources to individual priority measures in order to secure their implementation.

From the perspective of the whole project two basic objectives can be formulated for transport and transport infrastructure securing:

- Optimal use of the various transport infrastructure elements,
- Implementation of cost-effective development projects.

The document preparation process can be described using earlier elaborated topics which are in number of 10 and their outputs are presented in individual Books:

- **Analytical part within Books 1 – 3,**
- **Proposal part within Books 4 – 10.**

Transport Strategies follow from knowledge that transport infrastructure constitutes a logical and compact system which must be maintained, equipped, and - only in case of need - developed. Satisfaction of need in the form of investment may significantly contribute to development also outside of transport (CBA).

The whole drafting process of Transport Sector Strategies took place by gradual creation of 10 independent, however, interrelated parts – Books within the period 09/2011 – 06/2013. Individual Books were drawn up on the basis of interim Reports. This Summary Document represents a comprehensive result of the work done and is the concept within the meaning of Act No. 100/2001 Coll., that is being submitted to the Government of the Czech Republic after having been amended on the basis of consultations. The SEA evaluator cooperated with the project team for the whole period of the work. The result of his evaluation is thus reflected, to a considerable extent, in the final wording of the concept which was further adjusted under the process of settlement of comments resulting from the SEA process in the parts where the comments were accepted and integrated in the document.

Individual Books or Reports that served as the starting point for creating this concept do not make its direct part, however they are available to all interested parties at www.dopravnistrategie.cz, because they contain more factual information about the whole course of the works than it was not possible or suitable (mainly due to the scope of the text) to integrate directly to the final wording of the concept.

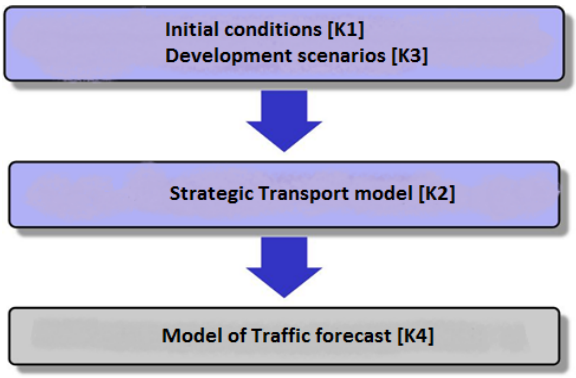

Figure 1.1 – Scheme of the analytical part of the project (Book 1 to 3)

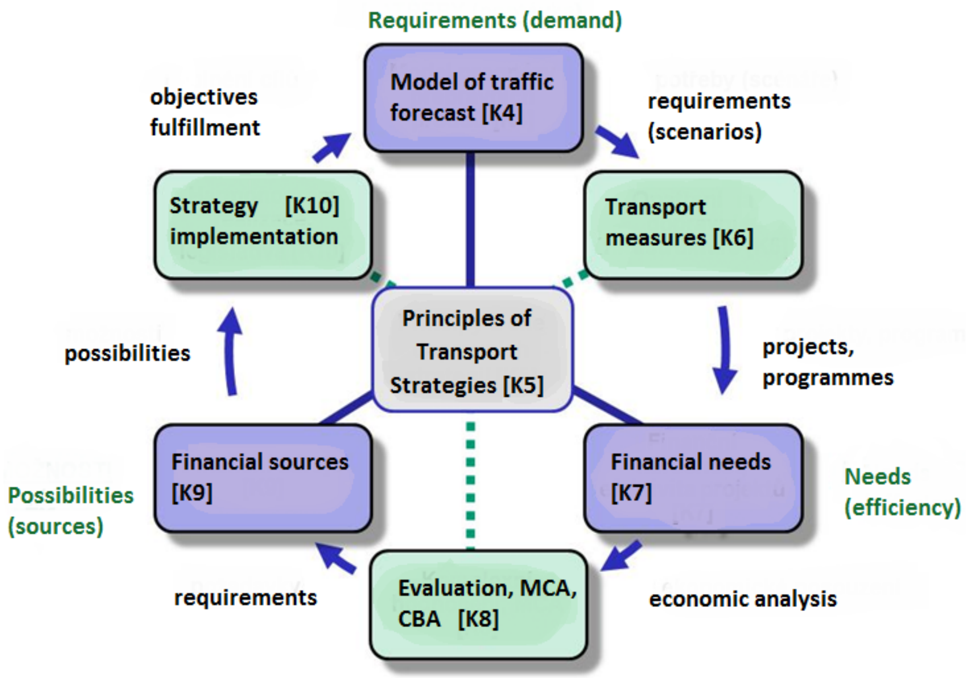

Figure 1.2 – Scheme of practical design (Book 4 to 10)

Book 1 – Initial conditions for Transport Strategies preparation

Book 1 provides an overview of initial and related documents relevant for the Transport Strategies preparation and both on the vertical (European, national, regional) axis and on the horizontal plane (various ministerial documents with direct impact on the Transport Strategies respectively on transport infrastructure development planning) and also creates a framework for the proposal part of the project. The document evaluates data of recorded and expected trends in individual transport modes in 1990 - 2040, it includes an analysis of transport time costs, reliability, as well as evaluation of the overall impact of emissions and other environmental externalities. It also includes a SWOT analysis of different transport modes and the methodology for the financial, regulatory and social framework assessment which indicates a trend of development in the country as a basis for the preparation of development scenarios in Book 3.

Book 2 - Strategic transport model of the Czech Republic

Book 2 processed the Strategic transport model of the Czech Republic (model of the current status). The book builds on the analysis of available data and their quality evaluation made within Book 1. The objective of transport modelling is to predict impacts of changes in the economy, territory, society and infrastructure on traffic demand and traffic network loading. The basic mechanism of the transport model is the interaction of transport supply and traffic demand. The traffic demand in the transport model is affected by information about the population, production, socioeconomic characteristics etc. Application of a multimodal strategic transport model supports a balanced development of all modes of transport and helps to optimize priorities of the traffic policy and, subsequently, to analyse the fulfilment of the policy.

Book 3 - Future Development Scenarios - Seminar

Book 3 sets the scenario for the most probable development of the society, science and technology in the horizon of the next 30 years. This specific seminar defines the environment within which the traffic model and its variables will be adjusted and measures defined to be taken with respect to transport infrastructure, including setting of their priorities. The scenarios represent analytical material and so they do not predict the future. Therefore impacts of the current policy and decision-making processes have to be considered in the context of the future plausible variants of development. The scenario assessed as the most preferred scenario will be one of the resources for setting the transport forecast and quantification of parameters of the prognostic traffic model within the work on Book 4 Model of Traffic Forecasts.

Book 4 - Model of Traffic Forecast

Book 4 describes the forecast transport model creation methodology and its results. It follows up with the current status transport model drawn up, which is described and calibrated within Book 2. The transport model serves within the Transport Sector Strategies as one of the evaluation tools of the measures being proposed in the course of work on the project. The initial assumptions entering into the forecast model were defined within Book 3. In addition to that, the parameterization of the forecast underlying drivers and comparison of the forecast results to the valid European transport forecasts were carried out. The transport forecast model is ready to be used for the evaluation of the transport measures within the project. In addition, the model traffic forecasts will serve the contracting authority as a tool for continuous evaluation of transport infrastructure development projects.

Book 5 - Principles and Objectives of Transport Strategies

Book 5 defines underlying starting points, objectives and principles of Transport Strategies. The objective of Book 5 is to set the purpose and direction of Transport Strategies. It will be used as the basis for defining criteria of assessment of projects, the procedure and rules for drawing up the plan of transport infrastructure development and as the case may be the recommended plan of implementation of individual infrastructure projects. Hence, the Book 5 will act as a roadmap to the strategy development (Book 10). Book 5 represents a transition stage between the analytical part and the proposal part.

Book 6 – Transport infrastructure measures

Book 6 collects data on planned measures (projects and suggestions) on the road, rail, water and air network and identifies additional measures not yet observed in the transport infrastructure (bottlenecks). Data are processed into a database that is further used. The database was created with the cooperation of a large number of stakeholders including Road and Motorway Directorate, Railway Infrastructure Administration, Directorate of Waterways or individual regional authorities.

Book 7 - Financial resources for transport infrastructure development

Book 7 presents the financial evaluation of transport infrastructure measures identified within Book 6. It also proposes adjustment in the pre-implementation preparation for projects whose financial needs do not correspond to transport or societal benefits. Book summarizes the requirements for development of transport networks investment and establishes a financial framework needed to ensure transport network operation (maintenance and repair) and traffic control.

Book 8 - Methods of Evaluation of Transport Infrastructure Projects

The evaluation identifies such infrastructure measures that meet the 3P principle – "Potřebnost" (necessity), "Průchodnost" (viability) and "Proveditelnost" (feasibility), which is taken into account in the three pillars of the evaluation. As regards measures that will not fully meet this principle, the methodology will also enable to determine the need for changes in individual parameters so that the principle can be met. Evaluation is based on the method of Multi-criteria analysis (MCA), and further on the method of a simplified Cost-benefit analysis (zCBA). "Projects" (infrastructure measures for which detailed information is available on the basis of already prepared documentation), and "Suggestions" (measures which are hitherto at the level of consideration without a specific proposal of a technical solution) are evaluated separately. For purposes of evaluation, individual projects and suggestions were joined into the so called clusters - a coherent set of constructions of transport infrastructure. Each cluster may thus consist of more projects or suggestions which are logically related to one another in the transport system and satisfy the indicated need.

Book 9 - Financial possibilities for securing development of transport infrastructure

Book 9 identifies all potential resources utilizable for the funding of transport infrastructure. The potential of individual resources theoretically available in the future is described here. The basic output here is a simulator of the resources of the funding of transport infrastructure which enables to parametrically work with individual resources and their development in time. The basic output of Book 9 is the requirement for stabilization of the source side of the transport sector. With the use of the simulator of resources, four variants of possible combinations of measures for maximization, stabilization and better predictability of resources of funding were analyzed which differ in adjustment of prerequisites regarding the combination of the sources of funding, and thus in the degree of available resources in individual years. However, Book 9 does not foresee a necessary political decision on selection of an appropriate combination of such sources which will lead to necessary stabilization of the sources. Only a stable or annually unequivocally predictable and - within the Ministry of Transport - partially influence able volume of resources will enable implementation of the conceptual approach to secure transport infrastructure. On the basis of results of previous Books, it can be demonstrated that transport infrastructure as a coherent system must be constantly perceived as a public service which cannot do without considerable participation of resources of public budgets, even in case the part of costs to be directly paid by users will be gradually rising. This principle is already addressed in the Transport Policy of the CR 2014 – 2020, from which principles the Transport Sector Strategies follow.

Book 10 – Implementation of Transport Sector Strategies

Book 10 predetermines the possibilities of implementation the principles of Transport Sector Strategies within the context of the current situation in the Ministry of Transport which necessarily influences the period of the years 2014 - 2020. It also contains the proposal of securing sustainability and development of transport infrastructure for this period, including the proposed schedule of implementation of individual measures and financial demands. The strategy primarily focuses on the period of the years 2014 to 2020 with an overlap to the long-term horizon.

Participants in the process of development of Transport Sector Strategies, 2nd Phase

Many entities participated in preparation and consequential discussions on partial outcomes of the project. The purpose of this chapter is to summarize information about the processes.

Project guarantor: Strategy Department of the Ministry of Transport of CR (MT)

Main consultant: Consortium + the subcontractors stated on page 2

Ex-ante evaluator: IKP Consulting Engineers, s.r.o. + subcontractor

The task of the ex-ante evaluator was to critically assess every interim Report (the primary version). The ex-ante evaluator's comments were subsequently integrated into the text together with comments of the project guarantor (the secondary version of Reports). The ex-ante evaluator participated in most meetings of the project team and was its adequate member.

SEA evaluator: Integra Consulting s.r.o. participated in the development process starting from the initial phases (12/2011). The whole process of needs identification and determination of individual measures was thus subject to constructive criticism as regards the environment and public health since its very beginning. The SEA process was officially launched in 04/2012. The whole SEA process is documented individually on the website of the Ministry of the Environment http://portal.cenia.cz/eiasea/detail/SEA_MZP129K where all information and documents required by virtue of Act No. 100/2001 Coll. are publicly available. As a part of the SEA assessment, all prospective projects or rather topics that were identified in the development process and can become a subject matter of a separate concept when they are updated are also studied. All these assessed parts are included in the documents submitted to and published by the Ministry of the Environment as a part of the SEA process, including maps of the scale corresponding to the national concept. The issue of ex-ante SEA process is dealt in detail in chapter 18.

Joint steering committee (JSC): the steering and monitoring body that discussed and evaluated individual outcomes submitted under the project, including evaluation of interconnectedness of activities carried out by individual entities. Representatives of individual organisations that are members of the JSC, cooperated with the Ministry of Transport in the inter-ministerial working group. The composition of the JSC (inter-ministerial working group): EC - DG Regio, EC - DG MOVE, JASPERS, 1st Deputy Minister of the Transport, Strategy Department, (MT), Department of EU Funds (MT), Department of Foreign Relations (MT), Department of Infrastructure and Land Use Plan (MT), Pardubice University, Faculty of Transport Sciences of the Czech Technical University, Ministry of Finance, Ministry for Local Development, Ministry of the Environment, Ministry of Health, Ministry of Industry and Trade, Association of Regions, Transport Union; NGOs representatives, State Fund for Transport Infrastructure, Road and Motorway Directorate, Railway Infrastructure Administration, Waterways Directorate.

Advisory board: The advisory board was established by mutual agreement between MT, the European Commission and the Jaspers Agency. The purpose of the advisory board is to transfer the best foreign practice to the implemented project. For this reason, the advisory board members are experts with European reputation and many years' experience in the field of transport, construction or financing (four foreign and three local experts from the academic sphere). The advisory board has been cooperating with the Ministry of Transport since the procurement procedures. The advisory board assessed each of the interim outcomes of the project (Reports or Books).

Book 1 – Initial Conditions for the Strategy Processing

2 Initial conditions

The main objective of Book 1 is to elaborate an overview of the source and related documents important for development of Transport Strategies both on the vertical (European, national, regional) axis and the horizontal level (documents of individual Ministries with a direct impact on Transport Strategies or, as the case may be, planning of the transport infrastructure development), thus creating a framework for the designing part of the project.

2.1 Summary of political and strategic documents

2.1.1 European and International Documents

Content and priorities of the Transport Strategies are substantially influenced by obligations arising from membership of the CR in the European Union and limitedly also by obligations given by international agreeements to which the CR acceded.

With respect to membership of the CR in the European Union, especially the following non-legislative and legislative documents of the EU were taken into consideration in the course of the process of preparation of the Transport Sector Strategies.

Strategic (non-legislative) Documents

- **EUROPE 2020** - Strategy for smart, sustainable and inclusive growth, COM(2010) 2020 final
- **Plan for moving** to a competitive low carbon economy in 2050, COM(2011) 112 final
- **WHITE PAPER:** Plan to a Single European Transport Area – Towards a competitive and resource efficient transport system, COM(2011) 144 final
- **An Integrated Industrial Policy** for the Globalisation Era, KOM(2010) 614 final
- **An Integrated European Action Programme** for Inland Waterway Transport "NAIADES" COM(2006) 6 final
- **Freight Transport Logistics Action Plan** COM(2007) 607 final
- **Action Plan for the Deployment of Intelligent Transport Systems** in Europe COM(2008) 886 final

EU legislation - including the upcoming legislation

- **Decision No 661/2010/EU** of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network

- **Proposal for Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network** COM(2011) 650
- **Proposal for a Regulation of the European Parliament and of the Council establishing the Connecting Europe Facility** COM (2011) 665, as amended
- **Proposal for a Regulation of the European Parliament and of the Council** on the Cohesion Fund and on cancellation of Council Regulation (EC) no. 1084/2006
- **Proposal for a Regulation of the European Parliament and of the Council** on common provisions regarding the European Fund for Regional Development, European Social Fund, Cohesion Fund, European Agricultural Fund for Rural Development and European Maritime and Fisheries Fund to which a common strategic framework relates, on general provisions regarding the European Fund for Regional Development, European Social Fund and Cohesion Fund, and on cancellation of regulation (EC) no. 1083/2006
- **Proposal for a Regulation of the European Parliament and of the Council** on special provisions relating to the European Fund for Regional Development and the target of the Investments for Growth and Employment, and on cancellation of regulation (EC) no. 1080/2006
- **Regulation (EU) No 913/2010** of the European Parliament and of the Council concerning a European rail network for competitive freight
- **Directive 2008/57/EC** of the European Parliament and of the Council on the interoperability of the rail system within the Community
- **Directive 2008/96/EC** of the European Parliament and of the Council on road infrastructure safety management
- **Commission Decision (2012/88/EU)** on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system
- **Commission Decision 2009/5607/EU** amending Decision 2006/679/EC as regards the implementation of the technical specification for interoperability relating to the control-command and signalling subsystem of the trans-European conventional rail system
- **Directive 2010/40/EU** of the European Parliament and of the Council on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport
- **Directive 2011/76/EU** amending Directive 1999/62/ES on the charging of heavy goods vehicles for the use of certain infraconstructions
- **Commission Decision 2009/561/EC**, amending Decision 2006/679/EC as regards the implementation of the technical specification for interoperability relating to the control-command and signalling subsystem of the trans-European conventional rail system

From among international agreements, the following documents deal with the issues contained in Transport Strategies:

- **Agreement AGR** (European Agreement on Main International Traffic Arteries) – (1983)
- **Agreement AGC** (European Agreement on Main International Railway Lines) (1985)
- **Agreement AGTC** (European Agreement on Important International Combined Transport Lines and Related Installations/Protocol on Combined Transport on Inland Waterways to the European Agreement on Important International Combined Transport Lines and Related Installations) - (1993/2009)
- **Agreement AGN** European Agreement on Main Inland Waterways of International Importance – (2009)

2.1.2 National Multi-sector Documents

The documents with multi-sector importance relevant for development of Transport Strategies are the following:

- **National Development Plan 2007-2013 (2005)**

  The source strategic document for the period when programmes under the EU funds are implemented in the regions of CR, including the proposed structure and focus of individual assistance programmes and the manner of their implementation on the national level - the main objective is an efficient and environmentally friendly transport of people and goods.

- **Policy of Territorial Development of the Czech Republic (2008)**

  A national instrument for territorial planning, determining, among other things, areas and corridors of the transport and technical infrastructure having international and national importance or with importance exceeding a territory of one region. The wording approved by the Government Decree No. 929 of 20 July 2009, including related documents, was used.

- **Government's Energy Concept (SEK)**

  In its vision, the Government's Energy Concept specifies the government's priorities and sets objectives that the government wants to achieve in influencing the development of energy economy in the perspective of next 30 years, under the conditions of market-oriented economy. The sections important for the transport area are those concerning power resources for transport and the perspective for development of their utilization (energy mix). Optimization of the energy mix will gradually lead to reduction of emissions related to the unit traffic performance. The task for the Transport Policy is then, in connection with SEK, to develop the Action Plan for Clean Mobility that will further develop the potential and directions of the development of sustainable mobility into detail.

- **Strategic Framework for Sustainable Development (2010)**

  The document's objective is to interconnect any measures, objectives and policies that may already be a part of the existing Transport Sector strategies, to identify any problems that have not been covered by the materials so far. It is addressed in three main sectors of development – economic, social and environmental

- **Strategy of International Competitiveness of the Czech Republic for 2012 to 2020**

- **Strategy of Regional Development**

  The basic document for the regional policy of the Czech Republic with the priority to secure regional and supraregional transport accessibility. The document was approved by the Government Decree No. 344 of 15 May 2013. It is the fundamental conceptual document in the area of regional development. It provides necessary points of departure and sets development objectives and principles for elaboration of regional development programmes. SRD is a tool for implementation of the regional policy and coordination of influence of the other public policies on the regional development. SRD interconnects sector perspectives (topics and priorities) with territorial aspects.

- **National Strategic Reference Framework 2007-2013 (2007)**

  The objective is to strengthen accessibility by means of transport and transport service and development of environmentally friendly transport.

- **Summarizing Proposal for Orientation of the Future EU's Cohesion Policy after 2013 in the conditions of the Czech Republic, Including a Proposal for Development Priorities for Drawing EU Funds after 2013 (2011)**

  It describes the context and process of the proposal for the national development priorities with respect to the drawing of EU funds after 2013, and submits a separate proposal for national development priorities and the follow-up process of preparation of the future cohesion policy after 2013. The main objective is to create functional transport, information, energetic and environmental infrastructure.

- **Government's Strategy in Fighting Corruption for the period of 2013 and 2014**

  The Strategy contains task No. 6.3.1 "The Strategy of Transport Infrastructure Construction". This task has been fulfilled by means of the "Transport Sector Strategies, 2nd Phase" document.

2.1.3 National Documents in Transport Sector

The documents that directly deal with transport and are of relevance for the Transport Strategies are as follows:

- **Transport Policy 2005-2013 (Update 2011) and Transport Policy 2014 - 2020**

It represents a basic strategic document with an influence on the transport policy process[2]. The Transport Sector Strategies being a document which elaborates on the main principles stipulated by the Transport Policy for the area of development and maintenance of transport infrastructure.

- **Transport Sector Strategies, 1st Phase (2009)**

  Short-term strategic document focused on selection and support of projects for the Operational Programme Transport – period 2007-2013

- **Strategy of Transport Services Support within the Territory (2005)**

  The objective is to create conditions for high-quality and efficient public transport

- **Strategy for Innovation Technologies in Transport (2009)**

  It is focused on creation of conceptual conditions for deployment of new technologies supporting objectives of the national transport policy

- **Strategy of Support to Logistics from Public Resources (2009)**

  Proposal for development of a network of public logistics centres

- **Model for Financing of Transport Infrastructure (2011)**

  Proposal of a new working model for financing of transport infrastructure

- **National Road Traffic Safety Strategy for 2011-2020**

  It defines basic principles and measures aimed at a radical decrease of the accident rate on roads in the Czech Republic.

- **Public Transport Plans**

  The point of departure for inclusion of the scope of public transport to the transport model were public transport plans elaborated according to Act No. 194/2010 Coll., on public services in the carriage of passengers, as amended, implementing the provisions of Regulation (EC) 1370/2007 into the Czech rule of law.

- **Other regional and local level documents**

2.2 Summary of available data sources of the socio-economic index affecting the transport sector

2.2.1 Socioeconomic indicators influencing passenger transport

The following table describes the availability of characteristics influencing passenger transport which were chosen within the construction of the Strategic

[2]The Transport Policy of CR 2014 – 2020 with the Prospect to 2050 (approved by Government Decree No. 449 of 12 June 2013) was prepared in parallel with Transport Sector Strategies. Works on Transport Sector Strategies continuously reflected the discussions on and progress in the development of this basic transport sector strategic document.

transport model. The basic territorial unit (zone) was elected Administrative district of the municipality with extended powers (SO ORP)

Detailed description of the model is in the Book 2 the strategic transport model of Czech Republic[3].

Characteristic	Description of the availability of required spatial distribution	Date	Availability
GDP	GDP is territorially divided into regions	2010	yes
Number of inhabitants in SO ORP	Data on population can be obtained in the public database of the Czech Statistical Office (VDB ČSÚ).	31.12.2010	yes
Number of inhabitants in a range 6-18 years	Age distribution within database is in 5 years range 0-4, 5-9, 10-14, 15-19 etc. We required specific distribution according SO ORP, ČSÚ processed it on request for the purposes of TSS2.	31.12.2010	yes
Number of employed inhabitants (wage lower than the average gross wage in the Czech Republic)	ČSÚ has no statistics on the number of employed inhabitants on the level of SO ORP. Portal of the Ministry of Labour and Social Affairs (MLSA) gives the number of economically active population[4], from which we subtracted the number of unemployed. Distribution according to the income is not available. The average gross monthly wage states CSO at the regional level. Wages certainly affects the choice of mean of transport but it is only one of several factors which transport model uses in calculating of the choice of means of transport.	12.2010	No, only total number
Number of employed inhabitants with wage higher than average gross wage in CR	As above	As above	As above
Number of unemployed	Portal of the Ministry of Labour and Social Affairs (MLSA) gives the number of unemployed resp. unemployed job applicants.[5].	12.2010	yes
Number of pensioners	Czech Social administration (ČSSZ) portal states Yearbook of pension insurance. Data on the number of pensioners are divided by regions and districts.	12.2010	yes
Number of registered cars	On the website of the Ministry of Interior in the section *List of vehicles* the number of vehicles is available with type in municipalities and SO ORP.	5.4.2011	yes
Population with a driving license	Register of driving license held by the Ministry of Transport. Spatial distribution of the number is only	24.10.2011	yes

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3 In Book 1 and 2 only model of presence is described. Information about forecast construction methods are part of Book 4 Model forecasts. Demographics including age structure were taken from ČSÚ projections.

4 Economically active population or the workforce comprises of the employed and unemployed

5 It is a job seeker who can immediately start to work if available it means registered unemployed who have no objective obstacle to entering employment. Prisoners, persons incapable of work or assigned to retraining courses or persons performing short term job or those receiving maternity benefits or granted unemployment benefits during maternity leave are not counted.

	on the regional level.		

Number of job places	Data on the number of job places are not available. Register of economic entities ČSÚ (RES) keeps data on the number of employees of economic entities[6] but it is dependent on the submission of such information to employers. More than half of entities do not report data.	12.2010	yes, with inaccuracy
The number of job places in tertiary sector	RES divides economic entities according activities.	12.2010	yes, with inaccuracy
Number of places in primary schools	Institute for Information on Education (UIV) provides data on the request about the number of pupils and the capacity of schools in the districts.	30.9.2010	yes
Number of places in secondary schools and colleges	UIV gives on request data on a number of pupils and school capacity in regions. Database on the level of SO ORP was prepared.	30.9.2010	yes
Number of places in universities	Statistic of capacity of universities is not monitored. UIV provided number of students in regions.	31.12.2010	yes
Sales area of retail places	Survey "Census of retail, accommodation and catering places (Places of business 2009)" had been preparing for 2009 and was then written in - Decree Program of statistical surveys (Decree No. 398/2008 Coll.). Unfortunately it wasn't realised mainly because of high cost, at a time of budget cuts there were insufficient funds. CSO conducted a single survey of retail places in 1999 - data are at the moment, of course, completely obsolete.	1999	no
Overnight stays in hotels by domestic guests	ČSÚ indicates attendance of mass accommodation in a public database.	For year 2010	yes
Overnight stays in hotels by international guests	ČSÚ indicates attendance of mass accommodation in a public database.	For year 2010	yes

Table 2.1 – Availability of socioeconomic data influencing passenger transport on the level of SO ORP

[6] Every legal entity or natural person with the entrepreneurial status and an organisational unit of the government that is an accounting unit

2.2.2 Socioeconomic indicators influencing freight transport

Characteristic	Description of the availability of required spatial distribution	Date	Availability
GDP	GDP is territorially divided into regions	2010	yes
Number of inhabitants in SO ORP	Data on population can be obtained in the public database of the Czech Statistical Office (VDB ČSÚ).	31.12.2010	yes
Number of employees in economic sectors	Database of the number of employees by principal activities of CZ-NACE in municipalities was processed on the request by the RES.	31.12.2010	yes
Functional land use	Land use related to production / attraction of commodity according to commodity groups NST 2007	2008-2010	yes

Table 2.2 – Availability of socioeconomic data influencing freight transport on the level of SO ORP

2.3 System of data collection of transport and traffic

The supreme body responsible for keeping statistics about the transport sector is the Ministry of Transport of the Czech Republic which annually publishes outcomes for individual transport branches in the form of the Transport Yearbook and quarterly overviews of the basic transport indicators.

Transport Yearbooks

Transport yearbooks are regularly published by the Ministry of Transport of the Czech Republic, providing a comprehensive overview of the state of transport in a given year and its development as compared to past years. Data in transport yearbooks are divided to six basic chapters, which are as follows:

- Economic indicators of development of the national economy and the transport sector
- Transport infrastructure
- Stock of transport vehicles
- Carriage
- Traffic accidents
- Impact of transport on the environment

Quarterly overviews of the basic transport indicators

Apart from the yearbooks, there are also quarterly overviews of the basic indicators for the transport sector published on the website of the Ministry of Transport. Information since 2002 until now has been available.

- Aggregate tables of transport of passengers and goods on the railway
- Brief summary of data on bus transport
- Brief summary of road goods transport
- Brief summary of urban public transport
- Aggregate tables of business air transport of passengers, goods and mail
- Outputs of airports in CR

Other sources of information about individual transport modes are:

- Czech Statistical Office – data on transport of goods, bus transport, territorial transport services
- Central Register of Vehicles – information regarding motor vehicles registered in the Czech Republic – vehicles can be monitored according to the place of registration, category, brands and types
- Traffic volumes on the road network – monitored in five-year periods – national wide traffic counting – traffic volumes on motorways, expressways, 1st class roads and selected 2nd and 3rd class roads
- Transport Accidents – monitored on the road network by the state police
- Data on passenger and freight rail transport – undertaken twice a year – number of passengers, transport performance at stations and stops are monitored; source of information about transport movements (trips origins and destinations) is Collection of service tools for timetable.
- State Navigation Management – data on water transport of goods
- LAVDIS (Elbe-Vltava transport information system – data on performance of local operators, general data about waterway transport, performance of foreign operators on inland waterways
- Civil Aviation Authority – monitoring of data regarding airfields in CR and other relevant information
- Eurostat – information about EU countries including CR
- National information system on schedules
- Centralized information system of testing centres (TC)
- Database of the Czech Insurers´ Bureau

In general, it is significantly more difficult to obtain quality data for transport model development in the Czech Republic than in Western Europe. The reason may be the historically low awareness of transport analyses and their importance for the society.

Data necessary for the transport model construction may be classified under several groups:

- The transport network and its parameters – it is quite well available, partially also in the GIS form
- Routing of the public transport lines
- Socio-economic data – a majority of demographic and socio-economic data are monitored by ČSÚ in sufficient detail
- Information on attractions of a territory – it is more difficult to obtain data in this area, they mostly come from several resources. Mostly, the data are not monitored in a structure suitable for a direct import to a transport model.
- Transport behaviour of the population – large-scope surveys of transport behaviour which are a common and available resource in Western Europe are still missing in the Czech Republic. Within the time framework of this project, it was not possible to propose and carry out a large-scope survey of transport behaviour. The author therefore used foreign surveys as the basis, adopting them to the Czech conditions and supplementing them from the statistics available for the CR.
- Business data about the goods transport – the specific composition of logistic chains, costs of transport for various modes, etc. are highly sensible data which are not provided even for the purposes of transport modelling. It was necessary to estimate the data on the basis of Czech and foreign studies dealing with this area.
- Traffic flows in the passenger and goods transport – these are sensitive data which are monitored in the aggregate form and were provided for the purposes of the transport model construction.
- Traffic loads in the passenger and goods transport – they have been monitored and made available for the purposes of the model calibration.

The transport model structure had to be partially adapted to the availability of input data. For more information see Book 2.

2.4 Interlink between the Transport Sector Strategies and Public Transport Plans

The Public Transport Plans both at the national and regional level with the validity of 5 years were developed in the Czech Republic in 2011 in accordance with the Regulation (EC) No 1370/2007 of the EP and of the Council, compliance of which is in the Czech legal system ensured by the Act No 194/2010 Coll., on public service in passenger transport. These plans were developed on the basis of a strategic document the Strategy for Public Service Support within the Territory being in force at that time. The above mentioned Public Transport Plans were taken as an input for a transport model of the Transport Sector Strategies as far as public transport range of operation is concerned.

As a follow up to the Transport Policy of the Czech Republic, the Public Transport Conception which will be a basic input for next updating of the Public Transport Plans after expiration of their validity in 2016, is being elaborated.

Measures concerning transport infrastructure, evaluated within multi-level multi-criteria assessment, result from the need to improve infrastructure parameters in order to enable better functioning and planning of public service range of operation according to the Public Transport Plans service. The measures aiming to eliminate identified bottlenecks were evaluated and recommended for implementation. The bottlenecks today are a limiting factor for orders and implementation of required range of public transport operation, possibly for achievement of a time position of time cycle nodes according to the elaborated analysis (reduction of travel time). As the Transport Policy and its individual follow up documents should be considered as one interlinked and mutually influencing complex, the Public Transport Conception will be based on the assumption of further development of transport infrastructure defined in the Transport Sector Strategies.

In the way mentioned above a continuous process of mutual influence of public transport range of operation and development of transport infrastructure, serving to transport, was set. Public transport arrangement cannot be separated from infrastructure planning. Range of operation order, frequency of services, quality and capacity vehicle parameters and extent of available infrastructure are mutually influencing conditions for economical effective functioning of infrastructure.

Each of the projects recommended for implementation in the successive period (namely in the period of 2014 – 2020) is always based on the need to fulfill transport demand. This will be proved individually within the framework of submitted project applications and relevant assessment of concrete projects, resp. it will be possible to further develop it in connection with the conditions defined in the chapter 59.

In order to ensure effective use of resources for public transport order, threshold for number of passengers where an order of a concrete public mode of transport would still be profitable, will be analyzed in the Public Transport Conception.

For correct functioning of public transport it has to be ensured that within the Public Transport Plans for all the levels there is a link of individual services (namely bus services) to backbone rail transport.

Furthermore it is necessary to also support the further effective development of public transport systems by individual smaller investment for ensuring sufficient e.g. parking capacity, luggage offices for bicycles etc.

3 Summary of SWOT analyses[7]

This chapter summarises strengths, weaknesses, opportunities and threat of particular transport modes. It was further analysed in Book 5 and following Books.

3.1 Road Transport

Among the **strengths** of the road transport sector as a whole belongs travel speed, mobility, flexibility and good accessibility of destinations due to high density of road network. Road transport has a relatively high reliability; the problems are rather of local character (congestion and accidents). Road transport also brings financial benefits for society in the form of tax revenues and revenues from tolls and vignettes.

Among **weaknesses** of road transport should be considered high impact on the environment (noise, dust, emissions, fragmentation of ecosystems), low energy efficiency/fuel demands and high costs of operation and maintenance of network management. The lack of funds for maintenance of whole road network result in particular greatly deteriorated infrastructure. Network is underdeveloped and largely obsolete in terms of design parameters roads. There are thus safety risks for users at many places. A major shortcoming is the significant gaps in services provision and level of comfort provided.

The main **opportunities** for the future are the development and increased use of modern information technologies that will lead to optimization of road network usage and solve problems with congestion. Proper repairs and regular maintenance could contribute to improve the services, construction of the necessary infrastructure (including bypasses, to eliminate the negative impact of transport) and the development of services according to users' needs and the specifics of its use (e.g. use of minibuses in places with low demand). Opportunities to improve road transport and reduce the negative impacts of transport on the environment are the use of alternative fuels and energy (especially in town), charging externalities and the development of combined transport.

The greatest **threat** to be considered is a lack of financial resources for the maintenance and development of the network infrastructure, thereby increasing congestion and reducing reliability. The threat derives also from the fact that there are still missing bypasses of towns and there is still an obsolete vehicle fleet being operated. Threat for the realization of some major road construction is the perception of the negative impact of operations on the environment through compliance with legal and noise and air pollution limits. Threat for the development of road transport is increase of prices of fuel and tolls, traffic regulation because of the overloading network capacity and charging for externalities.

[7] The full version of SWOT analysis is included in the Analytic document, book 1, chapter 8 (page. 42-61).

3.2 Rail Transport

Among the **strengths** of rail transport belongs compared to road transport less negative impact on the environment, in relation to transport performance low accident rate, positive developments in public transport, its usage in integrated transport systems, the growth of combined transport performance. The benefit is also relatively low demand for land occupation/acquisition.

Railway transport **weaknesses** include low flexibility, obsolete rolling stock, and generally the way it approaches to customers. This is partly limited by the rail transport infrastructure, particularly its capacity, parameters and low travel speed. In rail transport other related services are inadequate in both passenger and freight transport, which could otherwise improve the attractiveness of rail transport. Its noisiness may be designated as a weak point of the railway transport and the most significant external burden with a negative impact on health of inhabitants. In the case of new constructions, the effort to minimize ecosystem fragmentation must be respected as much as possible in design parameters.

An important factor in the **opportunities** in the development and improvement of transport services is the use of environmentally friendly options to promote continuous rail. In the field of passenger transport it is primarily to promote public transport in ensuring strong flows in long-distance transport, suburban and regional transport and creation of integrated transport systems. The rail freight is strongly focused on transport over long distances, particularly for bulk materials. The great benefit of international transport should be the implementation of interoperability and construction of high speed connections.

The main **threats** are strong competition of flexible road transport and lack of financial resources for maintenance, development and modernization of infrastructure as well as cyclic renewal of rolling stock and lack of funds for providing public services. The threat is also unclear policy with respect to inefficient regional lines.

3.3 Water Transport

The **strengths** of water transport can be considered to be the environmentally friendly mode (when completed waterway), high-capacity infrastructure, efficiency of navigation in the stable conditions, a tourist attraction and largely completed basic network of waterways of the Elbe and Vltava river.

Weaknesses are partly negative public perception, dependence on sailing conditions - due to weather, power requirements, etc., low speed, lack of port network, limited navigability otherwise comprehensive and modern Elbe-Vltava waterway in section between the state border and water work Střekov.

The main **opportunities** include the provision of reliable comprehensive navigability of the Elbe-Vltava waterway connecting the freight logistics centres and seaports, wider use for freight transport, development of recreational use (support for tourism).

The main **threat** is considered to be limiting the scope of investments that may result in non-use of existing infrastructure and fleet and then to a significant reduction of water transport. Another threat is difficulties of building preparation parameters to improve the navigability of the Elbe-Vltava waterway in view of the negative perception of the impact of buildings on the protection nature.

3.4 Air Transport

Strengths of air transport are high speed mainly on long distance, high safety and comfort of travelling and quality of services provided. Czech Republic has also good quality airport infrastructure with satisfactory parameters. The air transport is established range of support services.

The **weaknesses** include energy consumption, negative environmental impact, time and territorial availability of local airports and delays in connecting transport or expensive parking, necessary safety procedures. The weaknesses are undoubtedly the lack of runway capacity at the Vaclav Havel Airport Prague.

The **opportunities** include infrastructure development (both further development of low-cost airports, but also increase the capacity of existing airports) and modernization of the fleet, the use of modern technologies (e.g. for automatic clearance) and investment in the capacity of transport connecting public transport, especially rail (Vaclav Havel Airport Prague connections to rail).

Major **threats** for air transport is particularly declining economy and increasing security demands. Growth and lack of fuel prices would also affect the further development of air transport.

3.5 Intermodal Transport

The **strengths** include effective and economical means of transport, improved transport division of labour towards environmentally-friendly modes.

The **weaknesses** include the high cost of public terminals and logistics centres construction and unclear intensity of active state support in their construction and commissioning.

The **opportunities** include the development of logistics services in public centres, active government support in infrastructure construction.

The **threats** include lack of interest in logistics services, unequal conditions for market access and lagging implementation of slow implementation of development projects.

Book 2 – Strategic Transport Model of the Czech Republic

4 Introduction

Strategic transport model in general

A transport model, equally as any other models, represents a certain simplified figure of the real world. The objective of transport modelling is to predict impacts of changes in the economy, territory, society and infrastructure on the traffic demand and traffic network loading.

The basic mechanism of the transport model is the interaction of transport supply and traffic demand. The transport model contains information about transport supply represented by the traffic infrastructure and its parameters (capacity, speed etc.) Further, the transport model contains information about the traffic demand represented by transport volumes in the individual modes for passenger and freight transport, related to the so-called zones that serve as the origin or destination of journeys for a particular area in the transport model. The traffic demand in the transport model is affected by information about the population, production, socioeconomic characteristics etc. The main output from the transport model is the traffic loading, transport volumes and performances and other derived indicators. By changing the input parameters of the transport supply and traffic demand it is possible to simulate their impact on traffic.

The strategic transport model mostly represents a tool for evaluation of the traffic policy and its impacts at the national level. Application of a multimodal strategic transport model supports a balanced development of all modes of transport and helps to optimize priorities of the traffic policy and, subsequently, to analyse the fulfilment of the policy.

Objectives and use of the transport model

The transport model is used as one of the tools for development and evaluation of the analyses described below and performed within the framework of Sector Strategies. The analyses are performed particularly for the main traffic network and main transport links on the territory of the Czech Republic.

The author is aware of the fact that in the given time framework it was impossible to create a perfect multimodal transport model for passenger and freight transport. However, the author has used its experience to the maximum extent to develop a basic tool for a quality traffic analysis within the Transport Sector Strategies.

Strengths and weaknesses of the transport model in respect to the individual analyses are always evaluated so that the transport model is perceived as a valid and credible tool. The multimodal model of passenger transport and the basic model of freight transport is provided with documentation and handed over in an open form to the customer. The models thus may form a basis to be further improved and to become significant analytical tools for strategic decision-making by the Ministry of Transport of the Czech Republic.

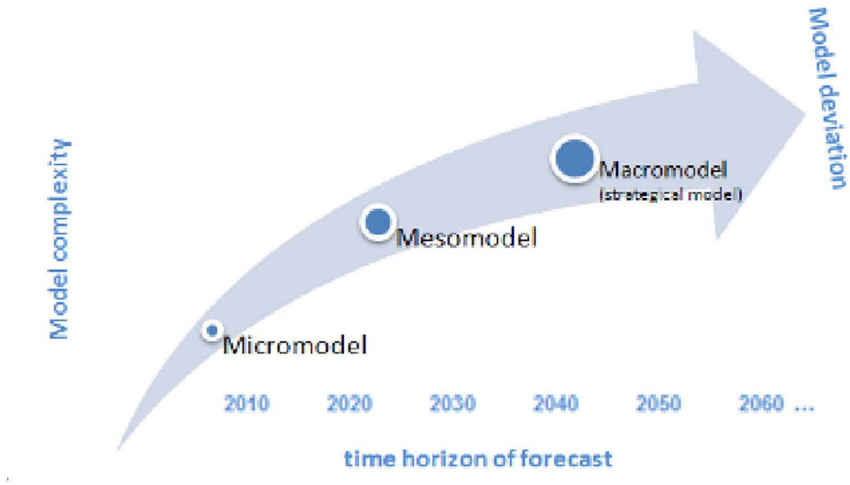

Figure 4.3 – Types of transport models based on the level of detail and forecast horizon

Calibration and validation of the transport model

The transport model calibration described in this report has been performed for all steps of the transport model calculation using the available Czech data. Where the Czech data were not available, comparable foreign sources were used. The created transport model is multi-modal, thus the values in the systems of individual and public transport were calibrated, and also in the main freight transport systems. The model shows relatively good compliance with the calibration data in the main transport network, for which it is intended.

The calibration quality has been evaluated statistically by means of the VISUM software. The compliance of the modelled and calibration data has been tested. One of the parameters being evaluated is the determination coefficient R2. The coefficient ranges within the interval (0, 1). In an ideal case if the model outputs equalled to the calibration data, the R2 value equals one.

Furthermore, the quality of the calibration was described by GEH statistics. In the case of perfect agreement of modelled and calibration data is GEH 100% in the case of this model is the minimum required GEH value of 70%

For passenger transport is the value of R2 for the PrT 0.95, 0.94 for rail, for bus 0.82 and for air transport 0.68.

GEH value is 80.9% for PrT, for rail 81.9%, for bus 73.8% and for air transport 73.9%.

For freight transport, is the value of R2 for road transport 0.90, for rail transport 0.95. For other modes of freight transport, the quality of calibration due to the absence of detailed calibration data was described in simplified manner.

GEH value for road freight transport is 70.1%, for rail freight 73.5%.

With respect to the number of zones contained in it, the developed strategic transport model shows a lower rate of accuracy, especially as regards areas of larger cities where a considerably lower loading is achieved through road transport modelling than is actually achieved in practice. The reason for this is especially inaccuracy of short-distance trips modelling – traffic services within a city and its surroundings. The inaccuracies however do not distort the results of the analysis of needs within the whole CR for which this level of modelling is sufficient. At the same time, this does not exclude the need for the modelling outcomes to be made more accurate, for example for the purposes of land-use planning.

5 Structure of the transport model

The strategic transport model was established so that it, to the maximum extent, enables analyses defined in the Transport Sector Strategies assignment.

Name	Strategic transport model for the Czech Republic	
Year of development	**2012**	
Objectives	**Modelling of measures on the key traffic infrastructure within the Czech Republic, new projects, adjustments of existing projects, outputs for further evaluation MCA, CBA**	
Transport	**Passenger (PT)**	**Freight (FT)**
Basic unit	AADT- annual average daily traffic	Annual values
Number of zones	486 (375 in the Czech Republic, 111 abroad)	486
Intra-zonal transport	Yes (only for calibration purposes)	Yes
Initial year	2010	2010
Forecast	2020, 2040	2020, 2040
Network	Roads, railway, waterway, air transport + PT transport supply	Roads, railway, waterway, air transport + FT transport supply
Basic outputs	Volumes, performances, traffic flows	Volumes, performances, traffic flows
Modes	1. Slow, 2. IAT driver, 3. IAT fellow traveller c, 4. Public transport (train, bus, airplane)	Road, railway, waterway, air transport, combined
Trip purpose	Short: 1. Commuting to work 2. Business, 3. Education, 4. Shopping (services), 5. Recreation Long 6. Private, 7. Business = 20 activity pairs	No
Groups	1. Age 6-18, 2. Lower income, 3. Higher income, 4. Economically non-active (car ownership is dealt with directly in the demand model by the groups)	NST 2007 aggregated into 10 groups
Demand model	trip based, 4 step, sequence	Steps 1 and 2 in the computation replaced with FT matrixes from surveys, steps 3 and 4 dealt with in the transport model
Variations during the day, year	Conversion of AADT, based on available surveys, to top or annual values	Possible conversion to average daily values
Algorithm of the network loading	Equilibrium – individual transport, Timetable – public transport	Equilibrium
Sources of data	CZSO, MoT, RMD, RIA, ČD and others.	CZSO, MoT, RMD, RIA, ČD and others.

Table 5.3 – Model for the Czech Republic, basic information

6 Cartograms

The volume flow diagrams of the traffic volume of the current state as of 2010 generated by the drawn up strategic model are shown in this chapter. The streamer thickness of the pie chart corresponds to the traffic volume amount.

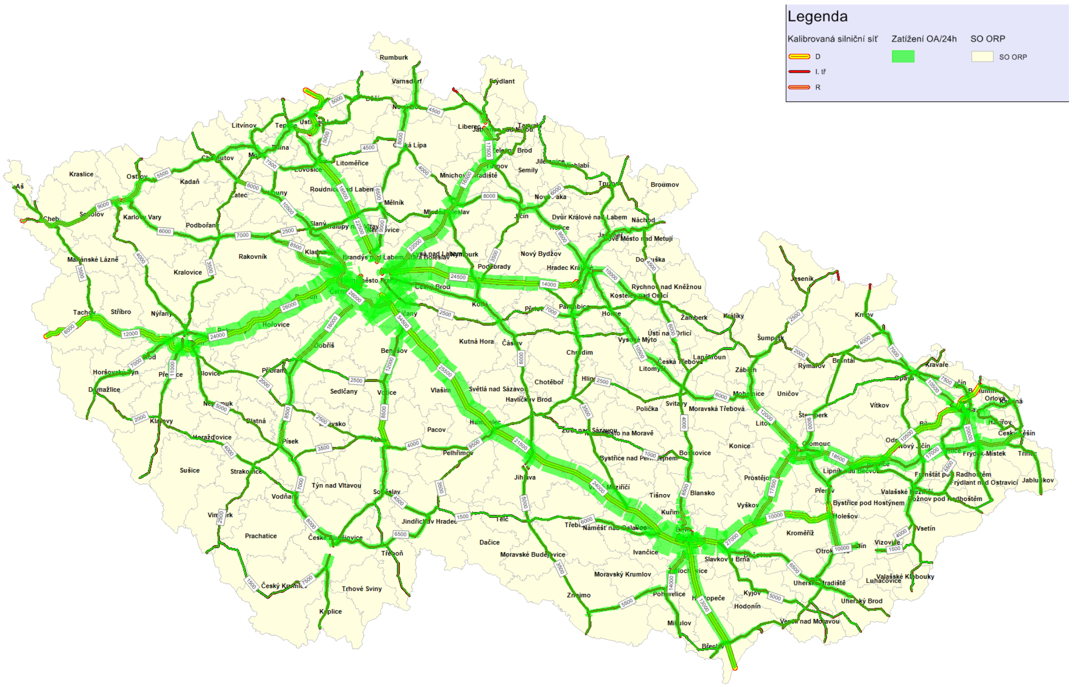

Figure 6.4 – Volume flow diagram of load with IAT, transport model 2010, vehicles/24h

Figure 6.5 – Volume flow diagram of the load with railway passenger transport, transport model 2010

Book 3 – Future Development Scenarios - Seminar

7 Future development scenarios

The scenario of the most probable development of the society, science and technology in the horizon of the next 30 years is the basic resource for setting the transport forecast with respect to the design horizons of 2035 and 2050. Using the *Future Foresight Planning* method, the scenario was developed during two seminars attended by decision-makers representing various sectors (Ministries, Research Institutes and Universities). Representatives of the general public were also invited to participate. The complete list of participants contributing to the scenario development is contained in Report 3.1 or 3.2 available on the project's website.

The objective of the first seminar was to define the drivers influencing the transport demand and modal split; the objective of the second seminar was then to set a definition of the most probable scenario of development of the society in the next 30 years.

The source document for the work carried out by the participants was the EU Transport Policy 2011 "White Paper: Roadmap to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System" and related studies provided by the European Commission.

Description of process and outcomes of individual seminars and consultation:

1.
   - Information for the first seminar represents both a SWOT analysis from Book 1, assessment of the social, financial and regulatory framework and thematic articles on the society development and examples of drivers introduced in Report 3.1
2.
   - Identification of key drivers for transport , definition of quadrant axes for scenarios proposal
   - Proposal of scenarios - working paper, scenario desription using identified drivers which presents the background document for second seminar.
3.
   - Within 2nd seminar amendments of the proposed formulation in description of four scenarios and subsequent evaluation and selection of the preferred scenario for society development in the Czech Republic in 30 years
4.
   - The main result of the seminars is the scenario that reinforces the strengths and overcomes the weaknesses of the selected scenario and incorporates elements from other scenarios, this so-called "fifth scenario" is used as a basis for Book 4.
5.
   - Converting results of the workshops into the traffic forecasting model.

Book 3 presents a comprehensive overview of the activities that were necessary for creation of traffic development prognosis in the horizon of thirty years.

8 Working Seminars

8.1 The First Working Seminar

The first seminar was focused on definition of the drivers and their assessment. Individual drivers with a significant influence on the future development of transport demand and selection of a transport mode was proposed by the participants of this seminars themself. The purpose of the meeting was to further analyse these drivers in detail and determine their influence on the future behaviour of the transport system.

By means of discussion methods, defined drivers were analysed and surveyed according to their significance and uncertainty of their development. Mutual independence between those individual drivers was considered as a significant standpoint.

The first working seminar provided basic information to the consutant of the project to formulate future development scenarios which were subsequently worked on during the 2nd working seminar.

The result of the first workshop is the definition of two key axes (drivers with a high impact on transport demand and low uncertainty of their development) which created matrix and its four quadrants predetermine the basic characteristics of individual scenarios.

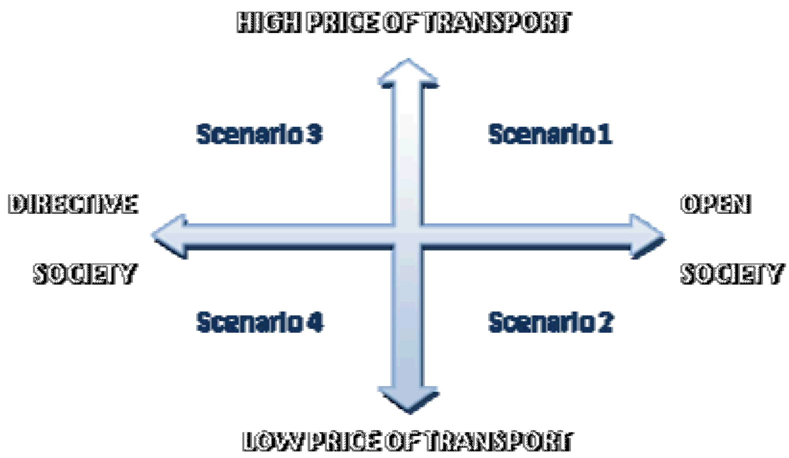

Figure 8.6 – Final quadrants for scenario description

8.2 The Second Working Seminar

The main objective of the seminar was to choose the most likely scenario out of the four scenarios of future development in following 30 years and to define trends of the input parameters for the transport model (traffic model categories) and furthermore also to create traffic forecasts.

The second working seminar was focused on the process of drafting the preferred (the most likely) scenario of development of the society.

Four proposed scenarios of possible future development working texts have been submitted for review and comments.

Working titles of scenarios:

- Scenario 1 – High Price and Open Society – SOCIETY IN MOTION, SUSTAINABLE DEVELOPMENT
- Scenario 2 – Low Price and Open Society – INNOVATIVE AND TECHNOLOGICAL DEVELOPMENT
- Scenario 3 – High Price and Directive Society – ENERGY CRISIS, CONTROLLED MOBILITY
- Scenario 4 – Low Price and Directive Society – LOCALIZATION OF THE ECONOMY, LOW MOBILITY

An integral part of the work methodology was the analysis of the scenarios in terms of the required parameters entering into the traffic model. After the discussions in working group had finished the final scenarios were assessed using the plausibility matrix which help to determine which of these scenarios is most likely with regard to its acceptability for the citizens, businesses and various organizations.

On the basis of those 4 basic scenarios the final 5th scenario was determined as the most likely scenario which the most closely aligns with expectations of the working group members. Within the seminar the assumptions for its achievement were designed and traffic model categories (parameters) described also for alternatives (for pessimistic and optimistic variants).

9 Likely Development: The Fifth Scenario

The final version of the most likely society development - Scenario 5 - is after the incorporation of all comments following:

New technologies will help to meet a number of objectives of the EU transport policy. Market principles prevail in the society, the power is distributed and the society is open. Due to growing prices of energies and a decrease in oil production, it was necessary and made possible through application of market principles to change the attitude to utilization of energies. Energy resources are diversified and renewable energies are used in a significant manner. At the same time, energy productions are gradually decarbonised in an essential manner, including sources of pollution generated by transport; in this respect, objectives of the EU transport policy are met. The price for this is a **high** and gradually further **growing price of energy** and therefore also the price of transport.

Because of the higher costs (that increase the price of products), transport is used with more emphasis on its efficiency and choice of transport mode. The economy is more localized and consumption happens close to resources The growth of mobility continued in a considerably slower manner.

Public transport is more used for regular journeys taken by passengers, shared journeys by passenger cars and vans are also utilized. This leads to a higher occupancy of vehicles.

The railway transport operated on electrified railway lines is used more for suburban, agglomeration and city transport. High costs of commuting lead to work from home, whether through IT technologies or at home farms. Products requiring to be hauled over long distances are expensive which considerably influences the production structure.

The demand for cars also changes; its growth does not continue in any significant manner, automobilisation in cities and regions with quality public transport services has decreased. A more considerable decrease is prevented by production of very cost efficient cars. Wealthier households have more types of vehicles - over short distances and long distances. The kilometric run of automobiles has not decreased; they are however less used for longer journeys. City electromobiles are used more.

The employment structure in the Czech Republic has been changing considerably, job opportunities are created in new industry sectors related to new technologies and services. The importance of the automobile industry for employment has relatively decreased, however, it still continues to be a significant employer; cars with new types of driving mechanisms and modally operating (so called intelligent cars) are produced.

No drop in utilization of long-distance transport has been detected; the economic situation has found its expression in a change of selected mode of transport; individual modes are affected by a change in the structure of the energy mix and a change of driving mechanisms in means of transport.

The economy and the society have been transforming gradually and smoothly, hence no significant crises arise. A higher price of transport and new ways of transport significantly changed the structure of traffic flows in cities and urban regions. Suburbanization of suburban regions differs depending on the attractiveness of a territory where the quality of their transport connection gradually becomes one of the significant factors for selection of a location, with a growing need for a quality connection to the public transport.

It is difficult for some developing countries to manage the new situation on the energy market which leads to migration to the Czech Republic, however within a manageable extent. This is also assisted with the situation when other regions previously belonging to the developing world have joined the developed world (the size of the developing world has been decreasing).

Because of higher energy prices and changes in demand for transport, the **transport infrastructure development** is more limited, targeted and focusing more on implementation of needed and substantiated measures; it is more focused on public transport. Maintenance of the infrastructure is given preference, excessive capacities or parameters of the road network burdening the economy with maintenance costs (where new capacities were not adequately planned). Problems exist with ensuring maintenance of a vast infrastructure, it is repaired selectively, some regional railway lines have been closed, the basic network in a required scope is however available in CR and other developed countries. There are problems with maintenance of the extensive infrastructure; it is repaired selectively, however, the basic network in the necessary extent is available in the Czech Republic and other developed countries, suburban railways have been gradually supplemented.

Book 4 - Model of Traffic Forecast

10 Introduction

The forecast has been drawn up using the strategic model of the Czech Republic drawn up in Book 2. The time horizons the transport model has been drawn up for are 2020, 2035 and 2050. The initial assumptions entering into the forecast model were defined on the basis of Book 3, the available literature, other expert meetings and the data provided.

The Book 3 scenario has been modified for the forecast model purposes on the basis of professional literature or other expert meetings and the data provided. The assumed growth of the transport prices has been reduced based on the official opinion of the Ministry of Industry and Trade (2). Also some preliminary results expressed in Book 3 were not confirmed during more detailed analyses. The modified Book 3 scenario taken over into the forecast model can be described in the simplified way as follows:

The economic situation of the Czech Republic is good; the GDP growth is relatively high with a declining tendency, significant ageing of the population occurs, which is mitigated partially due to migration into the Czech Republic. The society is coherent without significant social differences. The population grows slightly, after 2030 stagnation and slight fall occur. Production in the mining and heavy industry sectors reduces, including the employment in these fields, and to the contrary, the number of people employed in the service sector grows. Goods with higher added value are produced in the Czech Republic. The suburbanization trend continues in the existing locations and axes but with declining intensity. The fuel prices grow; for the reason of the growing oil prices more alternative fuels are used and also the vehicle consumption is reduced. The motorization degree grows with declining intensity. The EU continues to interconnect, both politically and economically.

For the transport forecast model, the most probable course of the input parameters and assumptions influencing the traffic demand with the inclusion of the assumptions of Book 3 was considered where these were not in significant contradiction to the course. Possible forecast deviations have been described in the form of low (pessimistic) and high (optimistic) scenarios. Also in the case of alternative forecasts, catastrophic scenarios are not considered, such as a very deep economic crisis, wars, pandemics, etc.

With regard to the mentioned results, it is necessary to mention these have been generated for the zero state of the transport infrastructure development. In case of higher transport infrastructure development, which will occur probably, it is possible to assume also higher traffic performance values. However, the zero scenario has been chosen as the initial basis for further assessment within the project. The objective of this approach is to exactly assess the separate function of an individual measure carried out within the existing scope of the network in a short-term horizon and subsequently evaluate its efficiency in the context of all the other identified measures that solve the indicated needs, in a long-term horizon.

The transport model has been elaborated in the VISUM application; it is not fully functional without the application. However, some data of the model can be exported to other applications (e.g. Excel, Access, ArcGis). One file contains the passenger transport model and the other the freight transport model. The files and extension data filters contain all data necessary for the model calculation. In the case of freight transport, the model of forecasts comprises three files for the time horizons of 2020, 2035 and 2050. In the case of freight transport, only one file can be used for calculations of forecasted horizons, only the calculation parameters have to be changed.

Passenger transport

For passenger transport, the growth of total traffic performances (Passkm) by 51% is assumed between 2010 and 2050. The anticipated trend is slightly higher than the values forecast by the EC for the EU 12 (new member countries). However, the forecast of the car transport results rather lower than the values forecast until now by the Road Directorate.

From the point of view of the modal split, slight fall of passenger car transport and bus transport and growth in air and railway transport are envisaged.

The main reason for slight increasing public transport preference is the change in transport behaviour caused by the ageing of the population. According to the Czech Statistical Office forecasts, the economically inactive population shall grow by 30% until 2050. The volume of public transport (or rather the volume of its order) will have also to be gradually adapted to the higher demand for transport, taking into account the available resources for its financial support from public sources. In this respect, it is necessary to promote mutual interconnectedness of all strategic documents following from the Transport policy of the Czech Republic.

Freight transport

For freight transport, the growth of total traffic performances (Tonkm) by 74% is assumed between 2010 and 2050. The expected trend ranges within the values forecast for the Czech Republic by the EC.

From the point of view of the modal split, slight fall of road transport and slight growth in railway and water transport are envisaged. In spite of its growth, the air transport would still represent only a marginal mode from the point of view of the traffic demand.

The main reason for the freight transport growth is in particular the assumption of good and stable economic situation according to the forecast provided by the Ministry of Finance. The continuing trend of growing international transport is another key factor for the growth of the transport performances. For the reason of the assumption of higher fuel prices, growth in the utilization of the railway transport occurs, in particular to the detriment of the road transport. However, the road transport still remains dominant mode.

11 Input parameter of the forecast model

Passenger transport

From expert seminars and analyses of transport statistics and professional literature it seems that the key drivers for development of passenger transport are the economic development of the EU and Czech Republic, and the socio-economic structure of the population. Another important driver is the price of transport linked to the price of fuels.

The dynamics of the economic development is expressed within the model parameterization by the cumulated growth of GDP.

From the point of development of GDP, the consultant draws upon the forecast by the Ministry of Finance. This forecast may seem optimistic in the light of the latest development in the Czech Republic and EU, but it is in accordance with the parameters of the preferred scenario from Book 3, where the economic perspective of the Czech Republic and the EU is described as good and stable.

Changes in the socio-economic structure of the population will probably have the most significant impact on the perspective development of transport. The total number of inhabitants will grow only very slightly, by cca 5 % till 2035 and then it will more or less stagnate. The population will be significantly ageing as in most countries of the EU, the number of economically inactive people will grow and the transport behaviour will change in relation to the age of the population. The development of the total number of people and the representation of surveyed socioeconomic groups, i.e. between 6-18 years of age, economically active and economically inactive, are derived from the forecasts issued by the Czech Statistical Office. The result of the ageing population will be a drop in regular commuting to work and business trips and a rise in the number of shopping, free-time and recreational trips.

Book 3 defined the major impacts of increased fuel prices on transport. The assumption of the higher growth of fuel prices was adopted, although not in its extreme variant, with respect to the data and forecasts of growth of fuel prices supplied by the Ministry of Industry and Trade (assumptions of the State Energy Policy). However, the impacts of the rising fuel prices will probably not be as significant as anticipated in Book 3. One reason for this is a comparatively high taxation of fuels in the Czech Republic, where a rise in the oil prices does not have such a major impact on the end price of fuels. Another reason is the expected decreasing consumption of vehicles and the use of alternative fuels.

It is expected that the price of fuels in this scenario will not have a major impact on directing of traffic flows; shortening of traffic distances or localization of production is not anticipated.

However, the development of transport demand is impacted not only by these global changes, but also by regional development. What is expected is continuing suburbanization in the traditional locations, but with decreasing intensity. Also expected is a drop in job opportunities in locations connected with mining or heavy industry (see SEK). On the contrary, there is an expected rise in the employment in the sector of services.

Freight transport

From expert seminars and analyses of transport statistics and professional literature it seems that the key drivers for development of freight transport are the economic development of the EU and Czech Republic and the trend of domestic and international transport development. Another important driver is the price of transport linked to the price of fuels.

The dynamics of the economic development is interconnected with the dynamics of the freight transport development, and it is expressed within the model parameterization by the cumulated growth of GDP. The development of domestic and international transport has been observed within the economic development, and in the last 15 years it is possible to see a drop in domestic transport and a rise in international transport (with an exception of the „crisis“ year of 2009).

From the point of the GDP development, the consultant draws upon the forecast of the Ministry of Finance. This forecast may seem optimistic in the light of the latest development in the Czech Republic and EU, but it is in accordance with the parameters of the preferred scenario from Book 3 where the economic perspective of the Czech Republic and the EU is described as good and stable.

The trend of the economic development is also related to the anticipated trend of dynamic growth in international and transit transport and a very slight growth in domestic transport. The dynamic growth in international transport is caused by the ever increasing influence of the globalization, and also by growing business relations within the EU.

Only slight growth can be expected in domestic transport due to the ongoing restructuring of industry and power industry, and the assumed production of goods with higher added value. Another possible risk is the continuing decline in domestic transport; this trend is anticipated and expressed in the minimum scenario of the traffic forecast.

Another assumption stated in Book 3 was significant growth in the price of fuels. Defined in Book 3 were major impacts of the increased fuel prices on transport. The assumption of the higher growth of fuel prices was adopted, although not in its extreme variant, with respect to the data and forecasts of the growth of fuel prices supplied by the Ministry of Industry and Trade (The State Energy Policy). However, the impacts of the rising fuel prices will probably not be as significant as defined in Book 3. The main reason is the very low price of transport compared to the value of commodities. Another reason is comparatively high taxation of fuels in the Czech Republic, where a rise in oil prices does not have such a major impact on the end price of fuels. Another reason is the expected decreasing consumption of vehicles and the use of alternative fuels.

It is expected that the price of fuels will not have a major impact in directing of traffic flows; shortening of traffic distances or localization of production is not anticipated. The trend will be rather opposite, as it can be seen from the previous text. However, there is an assumption of an effort to reduce the costs at the existing traffic routes, and thus use more than ever the railway and to a lesser extent also river transport. However, the dominant position in freight transport will remain occupied by the road transport mode.

Input	Source	Change compared to 2010 TREND			
		2010	2020	2035	2050
GDP	MF	1,00	1,27	1,74	1,88
Population	ČSÚ + scenario	1,00	1,02	1,06	1,05
Share of economically inactive population	ČSÚ + scenario	1,00	1,07	1,15	1,30
Motorization	MT, UN	1,00	1,14	1,19	1,20
Fuel prices	MIT, IEA	1,00	1,20	1,54	1,70
Driving mechanisms efficiency	Freightvision + own	1,00	1,07	1,13	1,16
Coal and oil consumption	SEK 2010	1,00	0,91	0,75	0,63

Table 11.4 – Summary of input parameters

12 Passenger transport forecast

Traffic volume - passengers

The total volume of trips will grow in 2020 by 11%, in 2035 by 20% and in 2050 by 22%, all values are related to the state in 2010.

As a result of the changed socio-economic structure by 2050, the total number of commuting trips and business trips will decrease by 11%. The number of trips for educational purposes will remain constant, the number of free-time activity trips (shorter trips) will grow by 11%, the number of recreational trips will drop by 2% and the number of long-distance trips will decrease by 8%.

Traffic performance - passenger-kilometre

Also, the traffic performances on the observed transport network in the Czech Republic was generated for the purposes of displaying of the forecast results. It should be mentioned that these results in their absolute values deviate from the statistics observed by the Ministry of Transport, mainly due to the lower extent of the road network and airlines observed by the transport model. In the area of railway and bus transport, the model surveyed only regular services in the territory of the Czech Republic. Regarding air transport, only regular lines within the scope of the model were observed (only important destinations in Europe and North Africa).

In respect to the stated results it must be said that they are generated for the zero state of development of transport infrastructure. In the case of more extensive development of transport infrastructure, which will probably occur, it is possible to expect even higher values of traffic performance. Nevertheless, the zero scenario was chosen as a basis for further assessment.

Car transport grows at a slightly higher rate than expected in foreign forecasts for the EU 12. On the contrary, the rate of growth is lower than expected in the forecasts by the Road Directorate. Again, it is necessary to draw attention to the fact that the forecast in this stage is made for the zero state of transport network development. The results of the high scenario model are closer to the forecasts by the Road Directorate. From the point of category of roads, the highest increase of the traffic load is anticipated on speedways and motorways, lower dynamics of growth is expected on category I and II roads, and some category II roads may even see a drop in the traffic load. So, the growth is not general, but it is rather development corresponding to the changed transport behaviour of the inhabitants and changes in regional development.

The trend of the bus transport growth is anticipated to be similar as in recent years. The iTREN project anticipates stagnation for bus transport in the EU 12, although this seems improbable in the case of the Czech Republic. The rate of bus transport growth and its reasons are similar as in the case of railway transport.

The stated results show comparatively high growth of railway transport, which contradicts with the recent falling trend. This growth can be explained mainly by the change in the socio-economic structure of the society (more senior inhabitants) and the related changes in the transport behaviour (more free-time trips, lower price of time). Another reason is the growth of fuel prices, predicted also in Book 3, making the costs of individual transport higher than the costs of public transport. When compared with the results of the TRANS TOOLS model applied within the iTREN and TEN CONNECT projects, the forecast nears to the rather more optimistic values of the TEN CONNECT project, which corresponds to the chosen scenario from Book 3. Possible deviations from the forecast are described in the form of the low and high scenarios in the following text. The volume of public transport (or rather the volume of its orders) will also have to be gradually adapted to the higher demand for public railway transport, taking into account the available resources for its financial support from public sources. In this respect, it is necessary to promote mutual interconnectedness of all strategic documents following from the Transport policy of the Czech Republic.

Significant growth is anticipated in air transport. Air transport grew by 81 % between 2000 and 2010. In recent years, its dynamic growth has slowed down, mainly due to the economic decline in the EU and USA. However, the economic forecast within the scenario of Book 3 is good, and this is reflected by the forecast of further growth of this mode, which will not be significantly weakened even by the rising price of transport. However, the forecast within the project is somehow more pessimistic than the trends of growth anticipated within the iTREN and TEN CONNECT projects. Possible deviations from the forecast are described in the form of the low and high scenarios in the following text.

The compiled scenarios are used as a basis for expressing possible positive or negative deviations of the forecast compared to the trend scenario in the overall values and for the individual modes. Always the lowest and highest values of the traffic load achieved within the tested scenarios are considered. Also, the forecast may be burdened with a possible deviation of the model, which is higher for less frequently used modes or modes lacking calibration data where the forecast is subject to a higher degree of uncertainty. In passenger transport it involves mainly bus and air transport.

Mode	Scenario	2000	2010model=100%	Development of passkm for scenarios		
				2020	2035	2050
Passenger car transport	HIGH			122%	138%	149%
	TREND			114%	123%	133%
	LOW	88%	51511mil.passkm=100%	102%	99%	80%
Bus transport	HIGH			125%	180%	191%
	TREND			112%	153%	150%
	LOW	89%	3972mil.passkm=100%	105%	125%	132%
Railway transport	HIGH			125%	180%	193%
	TREND			112%	152%	155%
	LOW	107%	6955mil.passkm=100%	100%	120%	123%
Air transport	HIGH			160%	210%	236%
	TREND			140%	164%	172%
	LOW	55%	3791mil.passkm=100%	95%	85%	66%
Total	HIGH			125%	149%	161%
	TREND			115%	130%	138%
	LOW	88%	66228mil.passkm=100%	102%	102%	87%

Table 12.5 – Traffic forecast (passkm), Summary for scenarios

13 Freight transport forecast

Traffic volume - tons

The development of the traffic volumes for the individual commodity groups (tonnes/year) is apparent from the following diagram. It shows the sums of the OD matrices for domestic and international transport (excluding transit). The traffic volume will grow by 29% between 2010 and 2050. However, from the point of the historical development in the period between 1995 and 2010, while the traffic volumes were dropping, this growth will be very light and will not exceed these values in any significant way.

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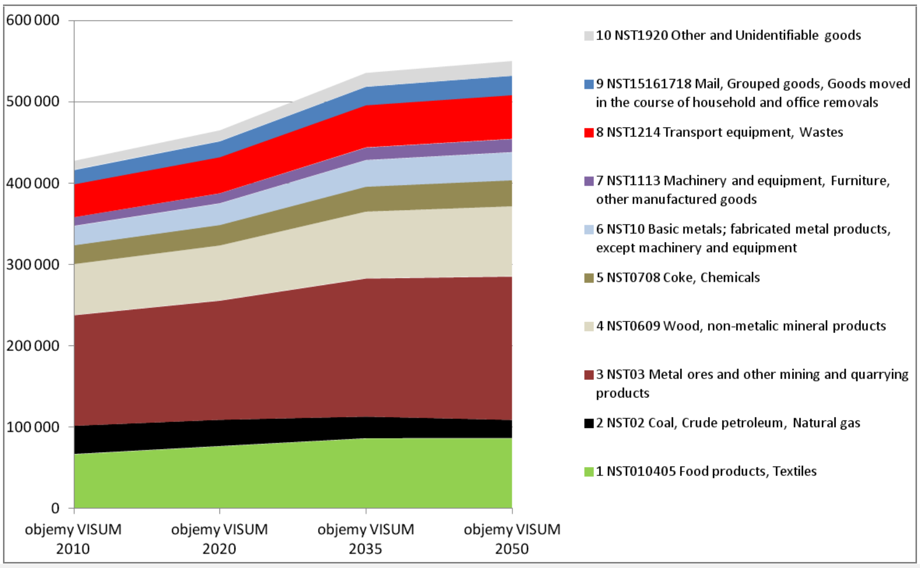


Figure 13.7 – Traffic forecast for the commodity groups (tons)

Traffic performance – Ton-kilometer

The traffic performance shows a significantly higher trend of growth than the traffic volume. The main reason for this is the assumption of the further growing proportion of international transport, resulting in the growth of the average traffic distance. Due to the assumption of the higher price of fuels, there should be a rise in the use of railway transport, mainly at the expense of road transport. Since the forecast is prepared for the zero variant of development of transport networks, in particular rail is to lower growth due to lack of capacity. However, road transport keeps its position of the dominant mode. Marked growth is anticipated also in river transport, mainly as a result of the higher price of transport, but also due to the political support from the EU. Further reason can be the slight modal shift from railway to IWW due to the limited capacity of railway network. Elbe WW leads in the same corridor as the main railway freight line for container traffic connection Prague – Hamburg. However, this transport mode will still be the one which is used only seldom due to the low traffic performances realized on waterways. The performance growth is anticipated also for air transport, but these values are negligible from the point of the entire modal split. The reason of slight growth in the air transport is also the growth of international transport and expectation of further growth in the transport of the valuable commodities.

The compiled scenarios are used as a basis for expressing possible positive or negative deviations of the forecast compared to the trend scenario in the overall values and for the individual modes. Always the lowest and highest values of the traffic load achieved within the tested scenarios are considered. Also, the forecast may be loaded with a possible deviation of the model, which is higher for less used modes or modes lacking calibration data, where the forecast is subject to a higher degree of uncertainty. In freight transport, it involves mainly inland waterways and air transport.

Mode	Scenario	2000	2010=100%	development tkm for scenarios		
				2020	2035	2050
Railway transport	high	126%	13770 mil. tkm=100	123%	138%	152%
	trend			123%	133%	146%
	low			91%	101%	104%
Road transport	high	75%	51832 mil. tkm=100%	163%	207%	220%
	trend			128%	166%	174%
	low			117%	119%	104%
IWW	high	114%	679 mil. tkm=100%	180%	235%	271%
	trend			170%	215%	234%
	low			119%	139%	146%
Air transport	high	169%	22 mil. tkm=100%	106%	133%	146%
	trend			105%	118%	132%
	low			100%	97%	87%
Total	high	86%	66304 mil. tkm=100%	155%	193%	206%
	trend			127%	160%	169%
	low			118%	122%	114%

Table 13.6 – Traffic forecast (Tonkm), Summary for scenarios

14 Cartograms

Further the volume flow diagrams of the traffic volume of the current state as of 2050 generated by the drawn up strategic model are shown. The streamer thickness of the pie chart corresponds to the traffic volume amount. **The results are generated for the zero state of development of transport infrastructure.** In the case of a higher development of the transport infrastructure there will be probably higher values of traffic intensity. Zero scenario, however, was chosen as the starting point for the further assessment of the project.

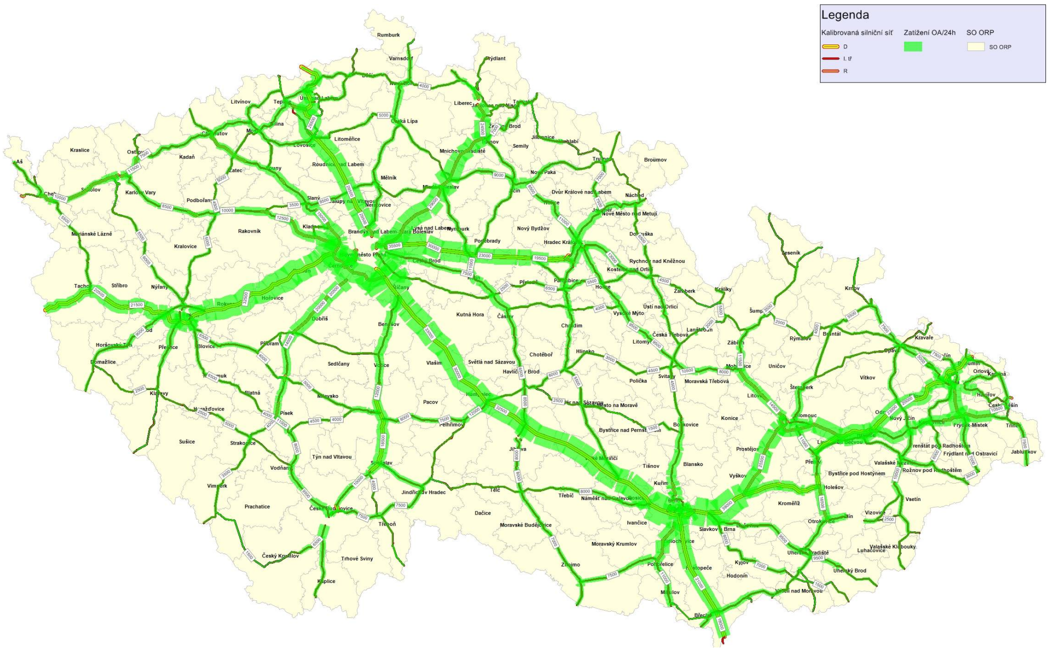


Figure 14.8 – Volume flow diagram of load with IAT, transport model 2050, vehicles/24h

Figure 14.9 – Volume flow diagram of the load with railway passenger transport, transport model 2050, persons/24h

Book 5 – Principles and Objectives of Transport Strategies

15 Summary of underlying starting points

The main external underlying starting points of the Transport Strategies are priorities arising from the European Transport Policy and the Transport Policy of the Czech Republic, essential for the draft are also indicators of fulfilment of the national transport policy from 2010. The main internal underlying starting points are the basic outcomes stated in the SWOT analysis of the initial conditions and in the scenario of future development designed according to the outcomes of two seminars.

Area	External underlying starting points		External underlying starting points
	EU	National	
To decrease environmental impacts, to transfer traffic from the conventionally fuelled road transport	▪ To reduce Europe's dependence on oil imports and to decrease CO_2 emissions in transport ▪ To transfer road transport to other transport modes ▪ To reduce utilization of "conventionally fuelled" automobiles in urban transport ▪ To introduce urban logistics essentially without any CO2 content ▪ To start enforcing the "user pays" and "polluter" pays principles consistently	▪ To support improvement of the fleet of vehicles of CR with the aim to achieve a 10% share of energy from renewable resources in transport, and reduction of emissions from transport in 2010 ▪ To ensure reduction of CO2 emissions by substituting fossil fuels with renewable sources of energy in transport ▪ To create conditions for development of electromobility	▪ New technologies will help to meet a number of objectives of the EU's transport policy ▪ Transport will be realised with greater respect to efficiency, employing transport means that are the most cost-effective ▪ Various types, urban and road, of passenger cars will be operated. ▪ Urban electromobiles will be used more
Safety	▪ To decrease the number of fatalities in transport	▪ To speed up construction of bypass routes around municipalities ▪ As a part of construction of new motorways and expressways, to realize constructed facilities and spaces immediately serving for securing traffic safety and flow continuity ▪ To support implementation of intelligent transport systems which increase safety and flow continuity of traffic ▪ To use capacities of navigation satellite systems for localisation of accident sites and warnings for drivers ▪ Depending on traffic	

Area	External underlying starting points		External underlying starting points
	EU	National	
		volumes, to separate motor and non-motor transport as much as possible	
Railway transport	▪ To transfer 30 % of the road freight transport exceeding 300 km to other transport modes, such as railway and IWW, by 2030, and more than 50 % by 2050 ▪ To complete the core TEN-T network by 2030, and the comprehensive network by 2050 ▪ To increase competitive efficiency of railway transport of goods ▪ To complete the European high-speed railway network until 2050 ▪ The major part of the passenger transport over middle distances should be executed on the railway by 2050. ▪ To interconnect all airports on the TEN-T core network with the railway network by 2050.	▪ Depending on funds available and preparedness, to complete modernization of transit corridors by 2018 ▪ To continue modernization of decisive railway junctions, including corridor interconnecting in railway junctions ▪ To prepare conditions for connecting all regions to a quality railway network ▪ To carry out rationalization of operation of selected regional railway lines in regions ▪ To support development of cross-border projects of railway transport in the places where strong transport flows may be expected ▪ To ensure development of track systems of the regional and city transport, including their combination, and development of terminals of public transport ▪ To continue preparing the railway connection for the Prague Airport in Ruzyně	▪ To use railway transport on electrified lines for suburban, agglomeration and urban traffic more intensively ▪ To transfer long-distance traffic to public transport, especially railway transport ▪ Generally, the transport output of freight transport will decrease, part of road transport will be transferred to the railway
Road transport	▪ To complete the core TEN-T network by 2030, and the comprehensive network by 2050	▪ To continue preparing all sections of the TEN-T Trans-European network in the Czech Republic and accelerate their construction ▪ To increase the efficiency of the existing system of transport infrastructure maintenance, to secure increasing of its quality and prefer it to construction of a new infrastructure ▪ To gradually connect all regions to a quality network of motorways and expressways; the capacity of	▪ Mobility will continue growing in a significantly slower pace ▪ Passengers are expected to use public transport for their regular journeys with a growing frequency ▪ A higher share of public transport in long-distance transport of passengers. ▪ A growing percentage of inhabitants using cars less, especially in cities ▪ Utilization of carpooling and vanpooling ▪ The kilometric run per vehicle does not change, long-distance

Area	External underlying starting points – EU	External underlying starting points – National	External underlying starting points
		newly constructed roads must correspond to the forecasted traffic volumes ▪ To ensure a higher quality of solutions of traffic transits through municipalities (traffic calming, bypass routes) ▪ To ensure a sufficient capacity of the road infrastructure in the border and sensitive areas ▪ To continue preparing and constructing projects aiming to increase the quality of connections to industrial zones and development investment areas	journeys are on the decrease ▪ A decrease in long-distance freight transport ▪ Local production is used more - hence, the percentage of short-distance transport will be increasing.
Waterway transport	▪ Extending inland waterways for new growth of markets, creation of multimodal services.	▪ To solve problems of navigability on utilized waterways with importance for transport and other waterways the development and modernization of which is in the public interest. ▪ Support to new projects of development of the waterway network.	▪ No significant inland waterway transport development will be realized due to limited capacities of networks
Air transport	▪ *To transfer 30 % of the road freight transport exceeding 300 km to other transport modes, such as railway and IWW, by 2030,* and more than 50 % by 2050, including from the air transport over distances up to 1,000 km, while the air space will bet hus released for long-distance flights. ▪ To introduce a modernized infrastructure of the air traffic flow management structure in Europe by 2020 and to complete the common European air space	▪ Modernization of airport engineering infrastructure of public airports aimed at increasing its capacity and quality and increased safety of air traffic. ▪ Efficient utilization of airport capacity and a higher transport capacity of the airport infrastructure	▪ Air transport will be very expensive and is used only in a smaller extent (it has been partially substituted with videoconferences and fast rail transport) and more significantly only over long distances.
Multimodal transport	▪ To put the EU-wide multimodal TEN-T "core network" to full operation by 2030. The network also includes bimodal and	▪ To seek for logistic solutions aimed at supporting the multimodal character of carriages	▪ Growing volume of combined/intermodal transport ▪ The interest in road transport of goods over shorter distances will

<table>
<tr><th rowspan="2">Area</th><th colspan="2">External underlying starting points</th><th rowspan="2">External underlying starting points</th></tr>
<tr><th>EU</th><th>National</th></tr>
<tr><td></td><td>trimodal terminals</td><td>▪ To support new projects from public sources in the area of intermodal and multimodal transport and logistics
▪ To make logistic services accessible to small and medium business entities in the industrial and commercial sectors</td><td>generate the need to solve logistic issues, including construction of logistic centres.
▪ The location of multimodal centres (in the vicinity of multimodal corridor crossings) and application of modern logistic processes, development of the city logistic will be of key importance</td></tr>
<tr><td>ITS</td><td>▪ To introduce respective management systems for surface and naval transport.
▪ To deploy the Global Navigation Satellite System (Galileo)
▪ By 2020, to develop a framework for the information, management and payment system of the European multimodal transport</td><td>▪ To introduce measures to minimize occurrence of congestions by implementing telematics systems that will help to optimize and manage the transport network traffic
▪ To install intelligent transport systems for traffic management on the main motorway routes, to increase safety and efficiency of transport
▪ To ensure implementation of global navigation satellite systems in transport, especially of the Europe's GALILEO programme
▪ To support introduction and development of ITS systems for freight transport in the public logistics, including optimization of supplies for cities (city logistics)</td><td>▪ To focus on the problems that have already been identified with respect to safety and capacity of roads and motorways
▪ IT technologies will replace some types of journeys (working from home, videoconferencing)</td></tr>
</table>

16 Horizontal principle for development of the Transport Strategies

The main principle of development of a strategy is finding a balanced approach to the transport infrastructure development, i.e. an optimal relation among three basic inputs:

- the needs of the infrastructure development - on a global basis and in individual sectors (transport modes),
- financial resources and their allocation with respect to the society-wide benefits, expressed by means of the economic assessment of constructions,
- feasible time horizons for the strategy implementation.

A strategy must also take into account principles of sustainable development - observation of principles of the environmental protection, socio-economic and social issues.

17 Priorities and objectives of the Transport Strategies

The priorities and objectives of the Transport Strategies are formulated on the basis of outcomes of the analytical part of the Transport Strategies which presents an overview of the main resource documents, including the Transport Policy of CR, which is the main conceptual document for the transport sector in CR as a whole and which is followed with the Transport Sector Strategies as the key strategic document determining principles of securing the transport infrastructure. Another significant point of departure is also the vision of further economic development based on the outcomes of the seminar – Book 3.

Basically, it is an application of the global and specific priorities of the Transport Policy used to set objectives of the Transport Strategies on the basis of the sections that have already been elaborated.

The global objective of the Transport Strategies is to develop a flexible tool for planning of the transport infrastructure development.

The priorities and related objectives of the Transport Strategies are based on the global objective and are further divided as follows:

- cross-sectional priorities and objectives for development of strategy,
- specific objectives of individual segments/modes, including the tools for achieving these objectives.

Cross-sectional priorities:

- CSP 1: Development of modern transport infrastructure of a high quality corresponding to the needs of users and meeting demand
- CSP 2: Application of conditions for regional cohesion
- CSP 3: Development of an operative and flexible system of planning and preparation of transport infrastructure projects
- CSP 4: Introduction of modern technologies in the area of information and transport management
- CSP 5: Securing of quality maintenance for the existing as well as newly constructed transport infrastructure
- CSP 6: Improvement of the internal and external traffic safety
- CSP 7: Implementation of measures leading to protection of environment and the public health
- CSP 8: Application of the economic and tariff policy aimed at development of harmonization of conditions on the transport market
- CSP 9: Application of the multimodal approach in transport

Specific objectives of road transport

- SO 1.1: The road network dimensioned with respect to real needs of users
- SO 1.2: Connection to the European transport infrastructure
- SO 1.3: Completion of the capacity backbone network of roads with the character of expressways
- SO 1.4: A high-quality network of Class 1 roads with a sufficient capacity securing interconnection of individual regions and their connecting to motorways and expressways
- SO 1.5: The optimal technical condition of the existing as well as the new road network
- SO 1.6: Safe road network
- SO 1.7: The possibility to regulate road traffic and secure a part of financial resourcesfor maintenance and development of the infrastructure directly from its users
- SO 1.8: Improvement of urban mobility

Specific objectives of railway transport

- SO 2.1: Modernization and development of the railway infrastructure
- SO 2.2: Securing of substantiated needs in the orders placed by regions and support to suburban transport
- SO 2.3: Securing of a sufficient capacity and parameters for freight transport in the space and time
- SO 2.4: Securing operability of the railway infrastructure
- SO 2.5: Optimization of the railway infrastructure costs
- SO 2.6: Responsible planning of the transport infrastructure

Specific objectives of waterway transport

- SO 3.1: An increase in reliability of navigational conditions
- SO 3.2: Prolongation of the network of waterways
- SO 3.3: An increase in the efficiency of waterway transport by allowing for navigation of vessels with higher parameters
- SO 3.4: Efficient port and service infrastructure
- SO 3.5: Elimination of down times in navigation
- SO 3.6: More extensive recreational utilization of waterways
- SO 3.7: Increasing navigation safety

Specific objectives of air transport
- SO 4.1 A network of airports with optimal dimensioning
- SO 4.2 Good accessibility of airports by means of other transport modes
- SO 4.3 Securing sufficient capacity and safety of the air space

Specific objectives of multimodal transport
- SO 5.1: Development of freight multimodal transport
- SO 5.2: Development of passenger multimodal transport

Specific objectives of intelligent transport systems
- SO 6.1: Improvement of the transport situation on roads, in urban agglomerations and in public transport
- SO 6.2: Increasing the mobility of persons and goods
- SO 6.3: Improving interoperability of the transport-carriage chain
- SO 6.4: Increasing safety of operations in the transport system

Table 17.7 – Cross-sectional priorities and specific objectives of Transport Strategies

18 Ex-ante Process of the Assessment of the Environmental Effects (SEA)

The process of the assessment of the environmental effects of the conception was carried out in accordance with the best practices and recommendations of stakeholders in parallel to preparation of this conception. The company selected by the evaluator Integra Consulting s.r.o. was participating in the process from the preliminary phase (12/2011). The whole process of identification of demands and determination of individual measures was therefore from the beginning subjected to a constructive critique from the environmental and public health point of view. Process of SEA was officially started in 04/2012. The whole SEA process is documented separately on the website of the Ministry of the Environment http://portal.cenia.cz/eiasea/detail/SEA_MZP129K where all information and documents as required by Act No. 100/2001 are available. In the framework of SEA evaluation all potential projects (suggestions) that where identified and can be subject of conception when being updated are also assessed. All these evaluated parts (including maps in scale corresponding to the nationwide conception) constitute the elements of the documents submitted and released by the Ministry of the Environment in the framework of SEA.

The exposition in this chapter does not substitute completed assessment of the environmental effect of the conception and assessment of effects on Natura 2000, that needs to be to perceived as inseparable part of the whole conceptual document Transport Sector Strategies

18.1 Key Parameters of Environmental Assessment - Extract from SEA report

The assessment of the environmental effects of TSS2 was carried out in accordance with Act No 100/2001 Sb., on environmental impact assessment, as amended. One significant underlying document was the Methodology for assessing the environmental effects of concepts (Ministry of the Environment, Planeta series, 7/2004). Based on the issued conclusion of the screening procedure, the environmental impact assessment also includes the assessment of effects on the Natura 2000 network of sites.

As part of the general level of evaluation, first the alignment of the concept's priorities with the reference environmental protection objectives was examined, and second, the potential effects of the concept's implementation on the different environmental components was evaluated. Possible effects on air quality, public health (including noise), water, nature and the landscape, monuments and cultural heritage, and the climate change were considered. Furthermore, effects on agricultural land resources, forest land and the possibility of conflicts with protected deposit areas were also evaluated. In accordance with legislative requirements (i.e. the conclusions of the screening procedure), the evaluation of effects on public health was also carried out.

In evaluating each cluster of transport constructions, the following key criteria were applied:

Air, taking into account the potential effects on areas that are sensitive in terms of human health and areas that are sensitive in terms of ecosystems, the effectiveness of diverting traffic from existing roads in residential areas, and the potential cumulative effect of the proposed clusters.

Nature and the landscape, taking into account the potential effects on the Natura 2000 network; specially protected areas, sites populated by specially protected species of national significance, areas with an abundance of specially protected species; loss of natural habitats, biodiversity; effects on territorial systems of ecological stability and significant landscape features; effects on natural parks and the landscape character, landscape fragmentation and landscape permeability to migration; effects on the water regime and large forest complexes.

Public health, taking into account the potential effects of the spatial distribution of air emissions and noise, and the socio-economic impacts of the proposed measures on human health.

The SEA evaluation was based primarily on the underlying information that was found in TSS2 itself (10 books) and on related underlying materials that had been provided by the consultants of TSS2. Given the level of detail that was applied within TSS2, the evaluation of individual clusters focused mainly on identifying risks associated with new construction of transport constructions. Subsequently, an estimate of the risk of cumulative effects was also made – where relevant – based on an evaluation at the level of individual clusters.

In cases where TSS2 included the assessment of alternative solutions to transport routes, the SEA included a comparison of alternative proposals at a level of detail that corresponded to that of the concept being addressed. However, given the TSS2 transport model's limitations in terms of information value (as it was not designed for comparing partial versions of individual constructions), the comparison of different alternatives only focused on the risk of direct adverse effects resulting from their implementation, and **in no way can it be a substitute for a comprehensive comparison of the different alternatives' environmental costs and benefits.**

Having evaluated the concept's alignment with the strategic objectives of environmental and health protection and based on the evaluation of the proposed packages of measures, the evaluation at the level of individual clusters of transport constructions and the evaluation of the risks of cumulative effects, the SEA consultant formulated the following conclusions.

Constructions that – according to available information – received a positive opinion in the EIA process and that meet the formal requirements for implementation have been included in the schedule of priority measures for the next planning horizon until 2020.

However, the evaluation of TSS2 as a whole (including the sets of project and suggestions to be implemented by 2050) indicates that – if the transport network is implemented in the proposed scope and with the envisaged traffic volumes – the concept's implementation will be associated with a risk of increased road transport emissions. However, given the excess capacity of the solution that has been pursued to date, a capacity reduction is being proposed for many projects in order to reduce the risk of the induction of new traffic.

By 2050, a significant decrease in the emission factors of road vehicles will most likely occur. If, however, the traffic volumes were to increase as envisaged in TSS2, it could be expected that the general nationwide trends in the Czech Republic would be dominated by an overall increase in two priority pollutants – particulate matter and benzo (a)pyrene – as they are also generated through re-suspension and brake and tire abrasion, i. e. independently of any decrease in the emission factors of motor vehicle engines.

By contrast, from the perspective of the territorial distribution of pollution, many areas (especially settlements on the existing network that will be relieved by implementing TSS2) should experience an improvement in local air pollution levels. An improvement can be expected especially in those urban areas where road network measures are being proposed aiming to divert traffic away from built-up and densely populated areas.

At the regional level, having assessed each cluster it can be concluded that the clusters that are proposed for Prague are likely to have – by a large margin – the greatest potential effect on air quality. They are followed by the Central Bohemia Region and the Zlín Region. The evaluation of the effects on air quality was carried out in a way that prevented any discrimination against transport infrastructure development in regions with above-limit air pollution levels. However, it is necessary to take into account that the implementation of new high-capacity road construction projects (e.g. highways with international transit that are part of the TEN-T network and that benefit the entire society) will bring new transport emissions to these areas, something that will need to be offset by measures on other sources in order to prevent air quality deterioration. This mainly applies to the Moravian-Silesian Region.

The sets of constructions that – according to the evaluation – have the largest potential effects on air quality include the following clusters:

The Prague bypass (clusters CS010, CS012, CS013), i. e. both in the form that has been submitted and its alternative suggestions. This is due to the fact that the proposed traffic volumes at the proposed clusters remain high and that air pollution in the area in which the constructions will be potentially implemented will increase. However, the constructions' implementation will displace traffic from much more densely built-up areas within Prague which – by extension – will result in reduced emissions in densely built-up areas. If, theoretically, the status quo were to be retained, congestion in the capital city of Prague would continue to get worse and there is a risk that the total amount of emissions would, as a sum, be greater than if the Prague bypass is implemented. Moreover, it needs to be noted that due to the absence of individual constructions within the Prague bypass the present routing of transit freight transport around Prague uses a longer route than necessary. According to road signs, freight transport over 12 tonnes must use a sufficient-capacity route along existing roads in order to minimise traffic routing through built-up areas – this results in an overall longer route and larger amounts of emissions. Each structure that is part of the Prague bypass was assessed in detail within the EIA process.

Any activities that may potentially result in increased traffic volumes at cluster CS003 (D1 Kývalka – Holubice extension), i.e. due to the already high contribution to local concentrations of air pollution that is caused by this road near residential areas). The plan was evaluated in the EIA process and a positive opinion was issued. A positive effect on the rerouting of traffic from more densely populated areas of the city of Brno (a reduced risk of congestions) has been demonstrated. In addition, traffic volumes will probably be significantly relieved by the gradual implementation of R35 between Hradec Králové and Mohelnice in the future.

Measures that may lead to a further increase in traffic volumes in the densely populated Otrokovice – Babice – Staré město – Rohatec corridor. The corridor is characterised by increased local concentrations of air pollution that also increasingly affect ecosystems in the Staré Město – Rohatec section. However, positive EIA opinions have been issued for all R55 projects in this section. Within the process, a positive effect has been demonstrated resulting from the rerouting of traffic outside the built-up areas of municipalities.

The Lípa – Horní Lideč corridor, which assumes the crossing of the Vizovické vrchy hills. This is due to an increased impact of air pollution on affected ecosystems in conjunction with poor air quality in the valley area around Vizovice and the high traffic volumes being proposed, including international transit traffic.

Even though the cumulative effects on nature and the landscape are also significant from a strategic perspective, these can be minimised – to a certain extent – as part of land use planning and the technical preparation of projects. In this respect, it is necessary to take into account in particular the potential significant cumulative effects on nature and the landscape in Prague and the Central Bohemia Region, the Southern Moravia Region and the ecosystem of the Elbe river.

Quite logically, the largest number of major transport constructions is located in the Central Bohemia Region (including Prague) as the Czech Republic's main transport hub. At the same time, this region is already significantly affected by its large number of transport constructions and the ongoing expansion of its built-up areas. According to the concept under assessment, the major new constructions that are planned here include a total of 5 fast connection routes (with no specific technical solution being designed for the arrangement of train exits from the Prague railway hub), the Prague ring road, and highway D3. Therefore, there will be significant cumulative effects especially on biodiversity and the overall burden on the area.

In terms of the cumulative effects of planned transport constructions on nature and the landscape, the Southern Moravia Region is also highly problematic. In addition to the existing highways D1 and D2, the following limited-access roads are planned in this region: R52 (a continuation of the existing limited-access road to the state border near Mikulov, routed along the existing I/52), R55 from Břeclav due NW, and R43 from Brno to the north. In addition, the fast connection routes from Prague to Vienna and from Brno to Ostrava are also proposed here. The accumulation of these plans will result in significant adverse cumulative effects especially on biodiversity and natural habitats, as well as on permeability to migration. It is therefore necessary to consider whether all of the limited-access roads that are planned to be built in the region are really necessary in terms of traffic and whether they need to be built with the proposed capacity. TSS2 assumes that the above approach will be applied in subsequent project work on R43, R52 and R55, where the required capacity will be separately verified and, where relevant, a reduction of capacity parameters will be proposed while making sure that the parameters required for the TEN-T network are met. TSS2 considers improvements to the navigability of the Lower Elbe, which may have significant cumulative effects on the river's ecosystem. In this respect, the biggest risks are associated with the possible implementation of the Děčín Weir. Since this plan is not yet part of the prioritised measures that are intended for implementation, the SEA consultant emphasises the need to ensure a thorough, detailed and independent assessment of its effects on the entire ecosystem of the Elbe River (which will be affected by this plan both downstream and upstream) within both ongoing EIA processes and ongoing transboundary consultations. In addition, the České Středohoří Protected Landscape Area may also experience the accumulation of the effects of highway D8 that is currently close to completion, planned road I/13 Děčín – Cvikov, fast connection route RS4 Prague – Dresden, and other smaller constructions.

As regards the overall assessment of the effects of TSS2 on health, it is safe to conclude that some TSS2 priorities have the potential to help improve transport safety and mitigate health impacts in terms of both noise and air pollution. However, the actual development of road infrastructure will result in a number of sub-risks that include, among others, an increase in the area of dusty surfaces from which dust particles will re-suspended and where ozone precursors will be generated under favourable weather conditions.

The most important benefit of the proposed concept is the preparation of the implementation of measures that include a large number of bypasses around municipalities and other measures to promote the relocation of a portion of traffic away from the centres of built-up areas and other locations where traffic is undesirable and where the population is exposed to high local levels of pollution (pollutants, noise). In terms of public health, other positive effects include positive impacts on employment and accessibility of services and health care.

18.2 Environmental Assessment and Multi-level Multi-criteria Evaluation Relation

The TSS2 comprehensive project considered a number of reference alternatives of measures on the network. These suggestions were either proposed by the consultants of TSS2 in accordance with the assignment or they were included in TSS2 project based on the requirements of non-governmental organisations or the initiative of the Ministry of Transport. However, these were often very rough suggestions without any spatial or technical verification. However the MMA toll was not design for such purpose. Therefore achieved results of alternatives assessment are not sufficient background for expert decision on this issue. The matter was almost alternatives of the suggestions in localities where these suggestions have not already been stabilized in land use planning documentations. TSS2 is not a concept that is intended to address the territorial routing of individual constructions. Transport Sector Strategies itself cannot substitute processes of individual steps of land use planning documentations as foreseen and defined by law. The territorial routing of transport routes is addressed primarily within land-use planning documents, i.e. at the strategic level, especially within the Principles of Territorial Development of self-governing regions to which it is always processed assessment to the sustainable development of the area (separate SEA process).

During the elaboration of the methodology for the assessment of the clusters of measures the content of the 2nd pillar of MMA was regularly consulted by the consultant team with the SEA evaluator. The SEA evaluator suggested moving assessment of all environmental effects to the 2nd pillar, to concentrate on assessment of overwhole effects on emission, nature, noise and public health and to assess it on basis of quantitative expert rating being able to cover their extent and sensitivity of affected environment. Despite the fact that due to a different approach to environmental effects in multicriteria analysis part of proposals for modification of MMA was not accepted, the consutant of TSS2 used several partial suggestions and backgrounds provided by the SEA evaluator.

The SEA evaluator provided with the maps of the large-area notably protected localities and NATURA 2000 and recommends also websites where the maps of localities with impaired quality of atmosphere and the maps of natural parks are available. According to SEA evaluator the corridor of 1km range was monitored with regard to the nationwide scale of conception.

When the territory affected by the noise was assessed at the strategic level, the density of newly affected built-up territory with noise above 50 dB was evaluated. Noise maps were then passed on the SEA evaluator for further processing. Critical traffic intensity for the evaluation of pollution affection of sensitive areas was determinate as 10 000 veh. /day. Monitoring of affection by the corridor´s cluster was carry out in case of localities with impaired quality of atmosphere, urban areas, the large-area notably protected localities and NATURA 2000. The identification of all potential conflicts of the corridor´s cluster with the large-area notably protected localities, NATURA 2000 and nature parks on the basis of agreed methodology was also done by the processor. Database of such potential conflicts was then passed on the SEA evaluator for further assessment. Drawings of whole network of corridor's clusters were given to the SEA evaluator too. The range of the corridor was determinated as uniform also for designs which are specified in more detailed matter. The reason of this approach is to ensure mutually comparability of possible effects of individual clusters.

The environmental criterions suggested by SEA evaluator was used during SEA evaluation as such, that can therefore provide with an alternative view on order of individual transport projects from the environmental point of view. The SEA evaluator recommends the inclusion of the environmental criterion used in the SEA evaluation for the future system of multicriterional analysis of TSS in next planning cycles and updates. When decision on prioritization of prepared projects for the next planning horizon will be taken, it seems to be appropriate to take more into account the environmental criterions as they enable to compare environmental aspects of different designs. This applies even in case when such designs come through detail assessment in EIA process.

18.3 The main conclusions of the assessment of the concept's effects on the environment and human health

Based on the evaluations that have been carried out, it can be concluded that the measures that are recommended by the TSS2 proposal (which was received from the Ministry of Transport on 13 June 2013) for implementation by 2020 meet the formal requirements for environmental protection.

The set of all projects and suggestions that are considered for implementation by 2050 contains a number of measures that can have significant positive effects on the environment and human health. In particular, these include measures promoting rail transport and multimodality, measures on the road network aiming to divert traffic from built-up and densely populated areas, and framework measures within General Packages B – E.

On the other hand, the set of projects and suggestions that are considered for implementation by 2050 contains a number of measures that can have significant adverse effects, both direct and cumulative, on the environment and human health (see above). In order to optimise the effects of Transport Sector Strategies 2, these aspects need to be carefully considered. In this regard, it is necessary to make sure that following measures are implemented:

- Ensure that any future revisions of the Transport Sector Strategies contribute to a downward trend in transport's contribution to the local concentrations of suspended particles, nitrogen oxides and benzo(a) pyrene, so that the levels of these contributions allow for meeting the relevant limit values in the entire Czech Republic.
- Ensure that any future strategy prefer the implementation of constructions and measures that actively promote this objective, above all, in regions with high air pollution and in residential areas.

In preparing any future revisions of the Transport Sector Strategies, it is necessary to initiate the preparation of a proposal of complex measures on the network aiming to reduce road traffic volumes, especially in areas with poor air quality. These complex measures (which include diverting traffic from sensitive areas, implementing relocations, establishing low-emission zones, improving the attractiveness and accessibility of public transport, interlinking transport modes etc.) must already be prepared for the next TSS2 revision so that they can be considered in parallel with other contemplated measures on the transport network.

From the perspective of reducing the Transport Sector Strategies' effects on air quality, in all areas with poor air quality it is necessary to: prioritise proactive measures to reduce emissions from transport; prioritise transport measures relating to the implementation of multimodal logistics centres aiming specifically to increase the proportion of rail transport at the expense of medium- and long-distance freight road transport; prioritise measures to develop cycling infrastructure in cities and suburban areas and provide more detailed information on the location, the alternatives, the capacity and other relevant parameters of measures that will serve to increase the use of railways and public transport.

It is recommended that – prior to the next revision of the Transport Sector Strategies – the aggregate benefits and negatives of the planned development of the Elbe waterway should undergo comprehensive assessment based on the results of the assessment of the Děčín Weir. This analysis should take into account in more detail the potential relocation of transport capacity to the modernised waterway.

In implementing the Transport Strategies, it is necessary to minimise interference with specially protected areas and Natura 2000 areas (especially in small-scale zones and large-scale zones I and II); ensure that constructions are permeable to migration; and minimise interference with water courses and the landscape water regime.

Book 6 – Identification of Transport Infrastructure Measures

19 Primary points of departure for Book 6

In accordance with the assignment, Book 6 deals only with identifying such measures in the infrastructure area that will help to eliminate bottlenecks and deficiencies or will help to meet the identified needs. Book 6 does not address organisation of traffic on the infrastructure. This approach is determined by the hierarchy of the strategic documents of CR, when the Transport Sector Strategies, as one of the documents following from the Transport Policy of CR, deal with the infrastructure that must be available in such a condition and scope so that it could enable traffic on this infrastructure in the scope that would meet users' needs. Hence, the issues related to the organisation and scope of traffic on this available infrastructure are to be solved exclusively by means of transport modelling which is, as regards the public transport, currently based on the effective plans of transport service on the national and regional levels. The prospective scope in which public transport will be secured will make a part of the Public Transport Conception, which is another of the documents following from the Transport Policy of CR.

Attention must be drawn to the fact that as a part of Book 6 a number of analyses that cannot be fully documented herein was carried out. In case of interest in better understanding all the steps taken as a part of identifying measures for the transport infrastructure, including a specific analysis of needs, see the complete version of Book 6 published at www.dopravnistrategie.cz.

19.1 Railway line categorisation

The railway lines are divided into 3 primary categories:

- Category E – Components of national railways currently included in the European Railway System (AGC)
- Category C – Other components of national railways
- Category R – Regional lines

The current categorisation is based on legislation in force and is available, e.g., from the "Declaration on Railways" (published by the RIA or other railway owners). For the analytical section of this paper, the inclusion of the railway lines in the different categories is assumed as it is in August 2012.

Inclusion of lines in categories is gradually changing at present, based on the paper "Criteria for Railway Network Categorisation" (MoT). The purpose of the concept is to propose criteria and then reclassify lines among categories if needed.

The following criteria have been reflected:

- Inclusion of the line in the European Rail Transport System or the AGC/AGTC agreements
- Freight traffic volumes
- Long-distance passenger transport with regular headways

- Other criteria (major long-distance connection between regional capitals, connection between major lines, city bypass, importance to cross-border traffic, other transport connections)

The proposal section of TSS2 works with the target proposal (for existing lines) as per the above concept in the outlook. The figure below shows the proposed target categorisation graphically.

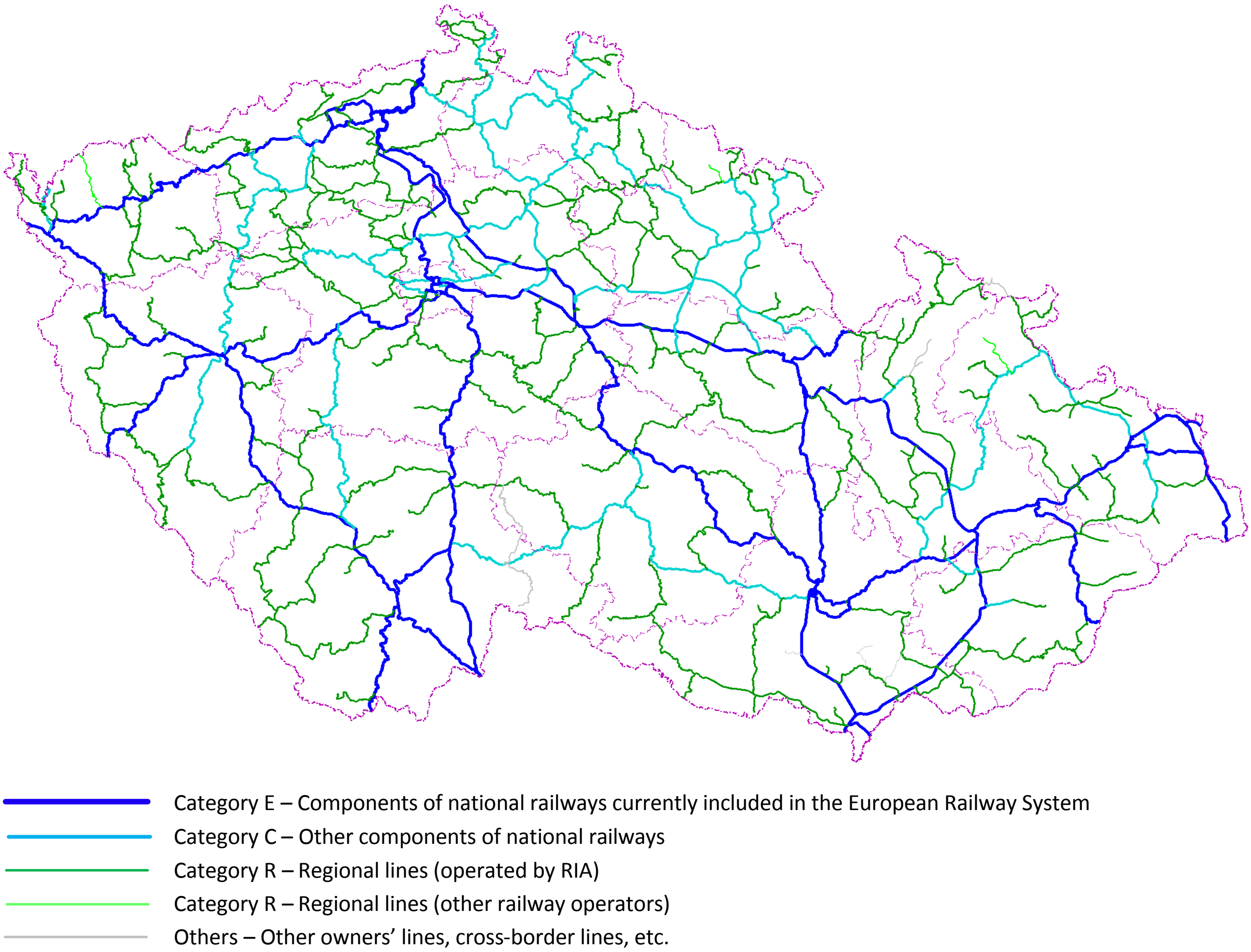


Figure 19.10 – Railway line categorisation (MoT proposal)

19.2 First-class road classification

The first-class roads are divided into five groups based on their importance within the transport system as defined by the below criteria (hereinafter, their "importance"). The detailed classification is based on the TSS2 Consultant's proposal, and its final form is the result of a discussion at the MoT, attended by representatives of the Consultant, the MoT, the ex-ante evaluator, the RMD and others, and results from a broad opinion consensus.

Classification into individual groups is designed also with respect to the prepared working material New concept of a motorway network which deals with a prospective form of the superior network of communications in the CR administered by the state and serves as one of the supporting documents for considered amendment to Act 13/1997 Sb. (Coll.), on communications over land. Classification of class I roads prepared within the project of TSS2 deals mainly with the existing state and condition, however, it is carried out in such a way that it is compatible with the prospective concept represented by the New concept of a motorway network and in relation to the result of consideration of this amendment it is possible to easily transform it into this concept. Version of the considered amendment to Act no. 13/1997 Sb. (Coll.) is in accordance with the principles of TSS2 determining importance of individual parts of the superior network of communications over land.

New Motorway Network Concept

On 13 August 2012, the Ministry of Transport presented a paper entitled "New Motorway Network Concept" on its website. The amended paper was submitted to the Government of CR for information on 30 January 2013. The government took notice of it. The purpose of the initiative paper is to promote the enforcement of the legislative amendment to Act no. 13/1997 Coll. on Roads, as amended, and Act no. 361/2000 Coll. on Road Traffic, as amended. The proposed legislative amendment was approved by Decree No. 262 of the Government of CR of 17 April 2013.

The purpose of the legislative amendment thus initiated is to achieve savings in the implementation of road construction projects resulting from a change in the design parameters for selected roads promoted until now and the achievement of a more readily understood marking of roads with relevant road signs.

The implementation of the proposals contained in the "New Motorway Network Concept" will have the following practical consequences:

- Design parameters for construction projects under preparation: A proposal to optimise the design parameters will be made for selected roads, less busy in the outlook, based on the evaluation of the results of an economic cost-benefit analysis. Some of the construction projects can then be executed with less costly parameters. Book 7 contains proposals for further work in this direction.
- Changes in road marking: At present, the road signs IP14 ("motorway") and IP15 ("expressway") refer to roads of a very similar type, and identical traffic rules apply on these two road types. The aim of the legislative amendment is to release the road sign IP15 ("expressway") for other roads than motorway-type roads (classes R&D nowadays) as well. The passing of the legislative amendment proposed would reclassify all expressways as "second-class motorways". These roads will then gradually be marked in the terrain using the road sign IP 14 (motorway). This will result in a different application for the road sign IP15, since there is a simultaneous proposal to change the traffic rules for roads with this road sign: the maximum speed limit would be 110 km/h, allowing local reductions or increases up to 130 km/h; the minimum vehicle design speed would be 65 km/h. Following a safety audit, the road sign IP

(expressway) could then be used to restrict non-motorised traffic and increase speeds on a selected portion of the country's road network. Roads classified as type B in the first-class road classification have been pre-selected as possible locations for the modified-meaning road sign IP15 tentatively; some sections of the type C first-class roads can be added in future.

For more detailed information on the New Motorway Network Concept, go to the MoT website: http://www.mdcr.cz/cs/Media/Tiskove_zpravy/Nove+pojeti.htm

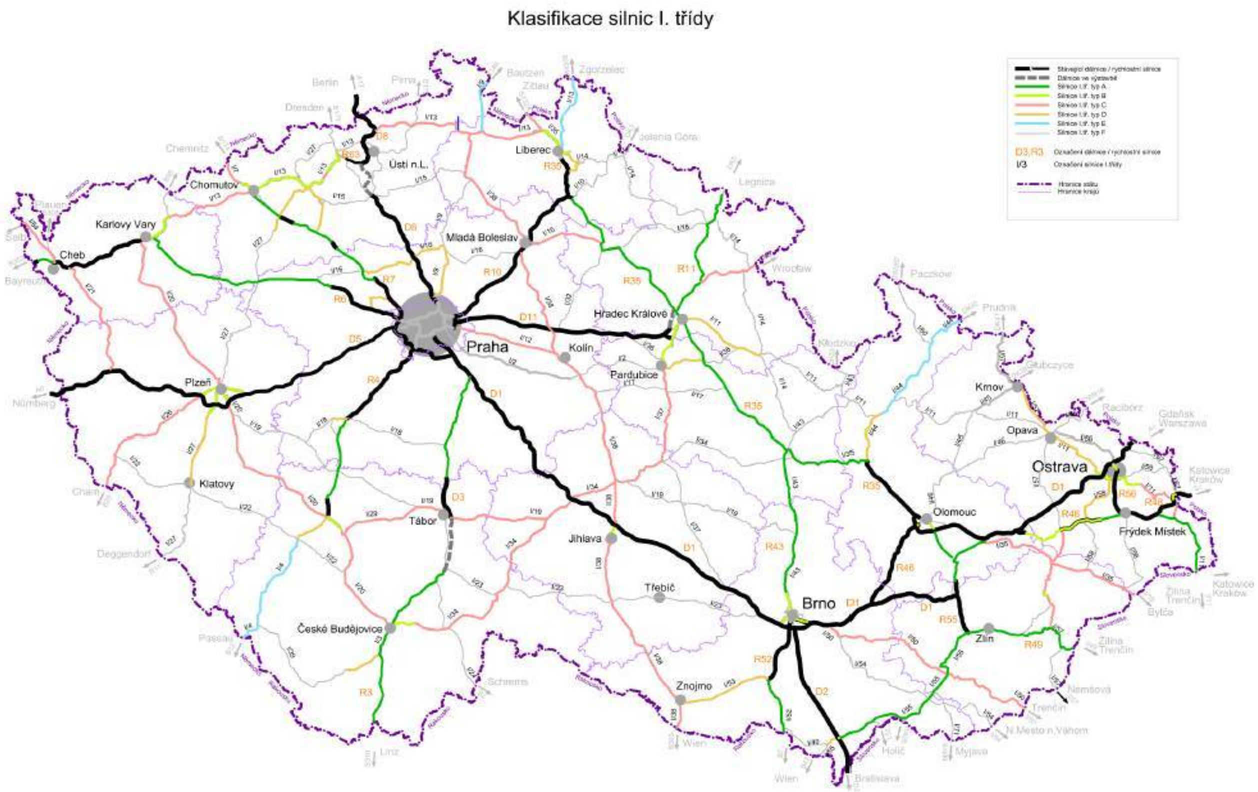


Figure 19.11 – Classification of the national road network

Table 19.8 shows the parameters of the different first-class road types into which this part of the road network has been divided.

The purpose of the classification is in particular to divide the first-class roads based on their importance. The classification results are applied in the subsequent analyses.

Type	Description
Type A	**Road importance** ○ part of backbone of road network that complements motorway and expressway network at present **Traffic volumes** ○ high traffic volumes **Relation to New Concept** ○ to be replaced with high-capacity road, typically motorway (as per New Motorway Network Concept) running along different route or complementary half profile already built motorway **Trunk roads** ○ self-contained international trunk roads or other cross-border connections
Type B	**Road importance** ○ major first-class roads with 4-lane arrangement for high travel comfort and fluent traffic **Traffic volumes** ○ high traffic volumes **Relation to New Concept** ○ "expressway" road signs will be installed on selected portions of these roads **Trunk roads** ○ typically shorter busier segments near big cities
Type C	**Road importance** ○ 2-lane roads connecting regions or providing less important cross-border connections or bringing traffic on higher-level transport network (current motorways, expressways and type A and B first-class roads) **Traffic volumes** ○ medium traffic volumes **Relation to New Concept** ○ "expressway" road signs will be installed on selected portions of these roads **Trunk roads** ○ self-contained trunk roads
Type D	**Road importance** ○ first-class roads carrying major suburban traffic **Traffic volumes** ○ medium to high traffic volumes **Relation to New Concept** ○ "expressway" road signs may be installed on selected portions of these roads in future **Trunk roads** ○ typically shorter busier segments near big cities
Type E	**Road importance** ○ first-class roads linking to remote areas, typically geographical protrusions of the CR **Traffic volumes** ○ lower traffic volumes **Relation to New Concept** ○ roads not included in the New Concept adjustments **Trunk roads** ○ roads linking to self-contained trunk roads, typically cross-border connections
Type F	**Road importance** ○ provide regional (or inter-regional) connections and links between larger settlements **Traffic volumes** ○ first-class roads with lower traffic volumes **Relation to New Concept** ○ roads not included in the New Concept adjustments **Trunk roads** ○ first-class roads not included in any of the above types

Table 19.8 – First-class road types as per the classification performed

20 Search for deficiencies

Deficiencies on the transport networks as defined in Book 5 are sought for the different modes, in compliance with the assignment.

Deficiencies on the transport networks are defined as network segments showing defects that preclude efficient and safe utilisation of the infrastructure. The deficiencies include the following:

- insufficient segment capacity
- accident area
- low running speed and low travel comfort
- environmentally unacceptable segment
- identification of insufficient connection of the existing or planned industrial zone on transport infrastructure

Due to the specific attributes of each of the transport modes under study, the results of this process are described separately in the following chapters.

20.1 Railway infrastructure

Deficiencies and bottlenecks in the railway network are analysed from three fundamental points of view:

- gaps and deficiencies in the TEN-T,
- insufficient parameters of the TEN-T and other selected lines, and
- insufficient capacity within the railway network.

The deficiencies and bottlenecks identified are compared with the measures identified. Unless the deficiencies and bottlenecks are eliminated as part of an existing investment measure, their elimination is newly included among the projects or suggestions.

20.1.1 Gaps and deficiencies in the TEN-T

This part of the analysis identifies places the upgrading of which is based on the TEN-T commitment and completion of transit railway corridors. They are chiefly sections that have not been upgraded yet as well as missing segments (parts of new lines/rapid links within TEN-T comprehensive).

No.	Segment	Line	TEN-T	TEN-T missing segments	TEN-T segments not upgraded
ZUM001	Choceň - Ústí nad Orlicí	010	CORE		X
ZUM002	Pardubice Main Station	010	CORE		X
ZUM003	Ústí nad Orlicí Station	010	CORE		X
ZUM004	Kralupy nad Vltavou - Nelahozeves	090	CORE (P)		X
ZUM005	PJ, Prague-Bubeneč - Úvaly	091,011	CORE		X
ZUM006	Vaclav Havel Airport Prague link	(120),122	COMP	X	
ZUM007	Prague – Beroun, new line	170	COMP	X	
ZUM008	Rokycany – Plzeň	170	CORE		X
ZUM009	Plzeň Junction	160,170,180, 183,190	CORE		X
ZUM010	Prague - Řevnice - Beroun	171	CORE		X
ZUM011	PJ, Prague Main Station - Prague-Smíchov	171	CORE		X
ZUM012	Plzeň - Česká Kubice	180	CORE		X
ZUM013	Prague - České Budějovice	220,221	COMP		X
ZUM015	Prague - Lysá nad Labem	231	CORE (F)		X
ZUM016	Olomouc Main Station	270	CORE		X
ZUM017	Ostrava Main Station	270	CORE		X
ZUM018	Hranice - Horní Lideč	280	CORE (F)		X
ZUM019	Ostrava - Mosty u Jablunkova	320	COMP /CORE (P)		X
ZUM020	Děčín - Lysá nad Labem - Kolín	072,073,231	CORE (F)		X
ZUM021	RL Prague - Ústí nad Labem	RL4	CORE /COMP	X	
ZUM022	RL Prague –Wroclaw	RL5	COMP	X	
ZUM023	RL Prague – Brno	RL1	COMP	X	
ZUM024	RL Brno – Břeclav	RL2	CORE		X
ZUM025	RL Brno – Přerov	300,RL1	CORE (P)		X
ZUM026	RL Přerov – Ostrava	RL1	COMP	X	
ZUM027	PJ, Prague-Radotín - Prague-Běchovice	link between 171 – 011	CORE		X
ZUM028	PJ, Prague-Hostivař - Prague-Libeň	link between 091 – 221	CORE		X
ZUM029	Česká Třebová Station	010,260,270	CORE		X
ZUM030	Brno Junction	240,250,260, 300,340	CORE		X
ZUM031	Přerov Station	270,300,330	CORE		X
ZUM032	Břeclav Station	246,250,330	CORE		X

Table 20.9 – Bottlenecks due to gaps in the railway network

20.1.2 Insufficient parameters of the TEN-T and other selected lines

This section analyses the satisfaction of basic parameters within the selected network, chiefly for express freight operation and with respect to safety and fluency. Parameters have been chosen that typically entail greater capital investment to eliminate. We analysed the lines included in the TEN-T as well as the other double-track lines outside the network where the criteria “Missing platforms” and “Halts with access across main track” can be applied.

No.	Segment	Line	CT code limitation	RLC limitation	Missing platforms	Halts with access across main track
ZUP001	Choceň - Česká Třebová	010			x	
ZUP002	Ústí nad Labem západ - Lysá nad Labem	072			x	
ZUP003	Ústí nad Labem-Střekov - Děčín Main Station	073	**67/391**		x	x
ZUP004	Prague-Holešovice-Stromovka - Prague Mas.n.	091		**D3**	x	
ZUP005	Kralupy nad Vltavou - Nelahozeves	091	**47/360**			
ZUP006	Děčín Main Station - Dolní Žleb	098			x	
ZUP007	Most - Vrbka Fork	123			x	
ZUP008	Chomutov – Most	130		**C4**		
ZUP009	Oldřichov u Duchcova - Ústí n. Labem západ	130			x	
ZUP010	Bílina - Ústí nad Labem západ	131			x	
ZUP011	Cheb - Karlovy Vary	140		**D3**	x	
ZUP012	*Vojkovice nad Ohří - Stráž nad Ohří (1 track)*	*140*		***D3***		
ZUP013	Karlovy Vary – Chomutov	140			x	
ZUP014	Zdice – Beroun	170				x
ZUP015	Plzeň Main Station – Rokycany	170		**D3**	x	
ZUP016	*Rokycany – Beroun*	*170*		***D3***		
ZUP017	*Plzeň Main Station - Plzeň-Jižní předměstí*	*170*		***D3***		
ZUP018	*Prague-Radotín - Beroun*	*171*		***D3***		
ZUP019	Číčenice – Zliv	190			x	
ZUP020	Plzeň Main Station - Plzeň-Koterov	190			x	
ZUP021	Nepomuk - Horažďovice předměstí	190			x	
ZUP022	*Plzeň Main Station – Nemanice Passing*	*190*		***D3***		
ZUP023	*Benešov u Prahy - Veselí nad Lužnicí*	*220*		***D3***		
ZUP024	Veselí nad Lužnicí - České Budějovice	220			x	
ZUP025	*Prague-Vršovice - Benešov u Prahy*	*221*		***D3***		
ZUP026	*Veselí nad Lužnicí - České Velenice - border crossing*	*226*		***D3***		
ZUP027	Kolín - Havlíčkův Brod	230	**57/381**		x	
ZUP028	*Nymburk Main Station – Babín Fork*	*231*		***D3***		
ZUP029	Mstětice - Lysá nad Labem – Kolín	231			x	
ZUP030	Havlíčkův Brod - Brno Main Station	250	**57/381**			
ZUP031	*Břeclav - Lanžhot - border crossing*	*250*		***D3***		
ZUP032	Česká Třebová - Brno Main Station	260			x	
ZUP033	Hranice na Moravě - Horní Lideč- border crossing	280	**67/391**		x	
ZUP034	Brno Main Station - Holubice	300	**57/381**	**C3**		
ZUP035	Holubice - Přerov	300		**C3**		
ZUP036	Dětmarovice - Mosty u Jablunkova	320			x	
ZUP037	Brno Main Station - Blažovice	340		**C3**		
ZUP038	Brno Main Station - Veselí nad Moravou	340			x	
ZUP039	Brno-Maloměřice St.3 - Brno-Židenice Fork	U	**57/381**			
ZUP040	Brno Main Station - Brno-Horní Heršpice	U	**57/381**			
ZUP041	Brno Main Station - Brno-Černovice Fork	U	**57/381**			
ZUP042	*Prague-Libeň - Prague-Malešice*	*U*		***D3***		
ZUP043	*Prague M.n. Passing 703 - Prague M.n. Passing 107*	*U*		***D3***		

Note: Shown in italics are segments with railway loading class limited to D3, which are not seen as significantly limiting below and no measures are identified for them to eliminate the deficiency.

Table 20.10 – Bottlenecks due to insufficient parameters

20.1.3 Insufficient capacity within the railway network

This section analyses the entire railway network from the point of view of insufficient capacity. The analysis worked with data and capacity calculations of the RIA as well as discussions with regional passenger railway transport clients and organisers.

No.	Section	Line	Peak	Daylong	TGTR	Platform edges	Client
ZUK001	Česká Třebová - Choceň	010	X	X	X		X
ZUK002	Choceň - Pardubice Main Station	010	X	X	X		
ZUK003	Pardubice Main Station – Kolín	010	X	X	X		
ZUK004	Kolín – Poříčany	011	X	X	X		X
ZUK005	Poříčany - Prague-Běchovice	011	X	X	X		X
ZUK006	Prague-Běchovice - Prague-Libeň	011	X	X	X		X
ZUK007	Choceň - Vysoké Mýto město	018		X			
ZUK008	Častolovice - Týniště n. O.	021		X			X
ZUK009	Častolovice - Rychnov n. Kn.	022		X			X
ZUK010	Václavice – Náchod	026	X	X			X
ZUK011	Turnov – Liberec	030		X			X
ZUK012	Turnov Station	030			X		X
ZUK013	Jaroměř - Stará Paka	030		X			
ZUK014	Turnov - Železný Brod	030					X
ZUK015	Pardubice Main Station - H. Králové Main Station	031	X	X			X
ZUK016	Hr. Králové Main Station - Jaroměř	031	X	X			
ZUK017	Jaroměř - Starkoč	032		X			
ZUK018	Smržovka - Josefův Důl	034					X
ZUK019	Železný Brod - Tanvald	035					X
ZUK020	Liberec - Tanvald (- Harrachov), incl. Tanvald Station	036	X	X	X		X
ZUK021	Liberec - Frýdlant v Č.	037		X			X
ZUK022	Hradec Králové – Hněvčeves	041					X
ZUK023	Jičín – Kopidlno	061		X			
ZUK024	Mladá Boleslav Main Station - Mladá Boleslav město	064	X	X			
ZUK025	Mladá Boleslav město - Dolní Bousov	064		X			
ZUK026	Bakov nad Jizerou – Turnov	070	X	X			

Table 20.11 – Bottlenecks due to insufficient capacity (Part 1)

No.	Section	Line	Peak	Daylong	TGTR	Platform edges	Client
ZUK027	Všetaty - Mladá Boleslav Main Station	070		X			
ZUK028	Prague - Neratovice - Všetaty	070					X
ZUK029	Veleliby - Mladá Boleslav Main Station	071		X			
ZUK030	Čelákovice - Brandýs n.L. – Neratovice	074		X			
ZUK031	Děčín východ - Benešov n.P.	081		X	X		X
ZUK032	Rumburk - Šluknov - Dolní Poustevna	083					X
ZUK033	Liberec - Česká Lípa	086					X
ZUK034	Česká Lípa Station	086					X
ZUK035	Lovosice - Litoměřice	087					X
ZUK036	Liberec - Hrádek n.N.	089		X			X
ZUK037	Ústí n.L. Main Station passenger station	090			X		
ZUK038	Prague-Bubeneč Station	091			X		
ZUK039	Prague - Kralupy nad Vltavou	091					X
ZUK040	Chvatěruby – Neratovice	092		X			
ZUK041	Kladno - Kladno-Ostrovec	093	X	X			X
ZUK042	Kladno-Ostrovec - Kralupy n. Vlt.	093		X			
ZUK043	Děčín-Prostřední Žleb Station	098			X		
ZUK044	Lovosice – Louny	114					X
ZUK045	Prague-Bubny – Hostivice	120	X	X			X
ZUK046	Hostivice – Kladno	120	X	X			X
ZUK047	Prague Smíchov combined st. – Prague-Zličín	122			X		X
ZUK048	Louny - Louny předm.	126		X			X
ZUK049	Ústí nad Labem západ	130				X	
ZUK050	Oldřichov u D. – Bílina	130		X			
ZUK051	Plzeň marshalling yard - Plasy	160		X			X
ZUK052	Cheb - Mariánské Lázně - Chodová Planá	170					X
ZUK053	Prague Main Station - Prague-Smíchov	171	X	X			X
ZUK054	Prague-Smíchov – Beroun	171			X		X
ZUK055	Prague-Smíchov - Prague-Řeporyje (- Nučice)	173		X	X		X
ZUK056	Rokycany - Mirošov (- Příkosice)	175		X			X
ZUK057	Plzeň Již. suburb. - Domažlice (incl.)	180	X	X	X		X
ZUK058	Domažlice - Česká Kubice	180		X			X
ZUK059	Janovice n.Ú. - Hamry-H.Stráž	183		X			
ZUK060	Nýrsko	183			X		
ZUK061	(Nepomuk -) Blovice - Plzeň Main Station	190	X	X			X
ZUK062	České Budějovice – Ražice	190					X
ZUK063	České Budějovice – Rožnov Fork	194					X
ZUK064	Prague-Braník - Vrané n.V. - Čerčany / - Dobříš	210					X
ZUK065	Světlá n.S. - Zruč n.S.	212		X			
ZUK066	Nemanice - Veselí n. Luž.	220	X	X			X

Table 20.12 – Bottlenecks due to insufficient capacity (Part 2)

No.	Section	Line	Peak	Daylong	TGTR	Platform edges	Client
ZUK067	Prague - Benešov	221					X
ZUK068	Jindř. Hradec - H. Cerekev – Jihlava	225	X	X			X
ZUK069	Veselí n.Luž. - Jindř. Hradec	225		X			X
ZUK070	Kolín Station (for Velim - Kutná Hora)	230			X		
ZUK071	Prague - Lysá nad Labem - Nymburk (incl.)	231			X	X	X
ZUK072	Velký Osek	231				X	
ZUK073	Balabenka Fork	231			X		
ZUK074	Havlíčkův Brod - Žďárec u Sk. - Chrudim	238		X			
ZUK075	Chrudim - Pardubice-Rosice n.L.	238		X			
ZUK076	Střelice - Zastávka u Brna	240	X	X			X
ZUK077	Zastávka u Brna - Náměšť n. O.	240		X			X
ZUK078	Třebíč - Náměšť n.O.	240					X
ZUK079	Brno Main Station - Brno-Židenice	250	X	X			X
ZUK080	Brno - Hrušovany u Brna	250					X
ZUK081	Tišnov - Nedvědice - Žďár n.S.	251		X			X
ZUK082	(Letovice -) Blansko - Brno	260			X		X
ZUK083	Bohumín - Ostrava Main Station	270	X	X			
ZUK084	Ostrava Main Station – Ostrava-Svinov	270	X	X			
ZUK085	Prosenice - Dluhonice	270			X		
ZUK086	Olomouc Main Station – passenger st.	270			X		
ZUK087	Č.Třebová odj.sk - Třebovice v Č.	270				X	
ZUK088	Červenka – Prostějov	273					X
ZUK089	Olomouc - Šternberk - Uničov (incl.)	290			X		X
ZUK090	Brno - Přerov	300	X	X	X		X
ZUK091	Olomouc Main Station-Prostějov Main Station (- Nezamyslice)	301	X	X			X
ZUK092	Kroměříž - Hulín - Holešov (- Val. Meziříčí)	303					X
ZUK093	Opava východ - Krnov – Valšov	310		X			X
ZUK094	Odra Fork – Ostrava-Svinov	321	X	X			
ZUK095	Ostrava-Svinov - Opava východ	321					X
ZUK096	Č. Těšín - Frýdek Místek	322		X			
ZUK097	Ostrava-Kunčice - Frýdek Místek	323			X		X
ZUK098	Ostrava střed Station	323			X		
ZUK099	Vizovice - Zlín střed - Otrokovice	331		X			X
ZUK100	Brno-Černovice - Brno Main Station	340	X	X			
ZUK101	Bojkovice – Kunovice	341		X			X
ZUK102	Brno Main Station	U			X		X
ZUK103	Liberec Station	U			X		X
ZUK104	PJ, Prague-Libeň - Prague-Malešice	U			X		X
ZUK105	Trutnov Main Station	U			X		
ZUK106	PJ, Prague Masarykovo nádraží	U					X

Table 20.13 – Bottlenecks due to insufficient capacity (Part 3)

20.2 Road infrastructure

Deficiencies on the road network are analysed from the following fundamental points of view:

- insufficient segment capacity
- deficiencies due to incomplete network
- deficiencies along municipal first-class thoroughfares (negative effects on public health and parametric defects)
- accident area
- low running speed and low travel comfort
- environmentally unacceptable section

20.2.1 Deficiencies due to incomplete network

These deficiencies are identified in terms of both TEN-T completeness and the completion of the planned motorway and expressway network. The necessity of the sections identified as deficiencies was verified using an analysis of improved access times.

Road no.	Section	Deficiency	Remark
D1	Mirošovice - Kývalka	Unacceptable repair	
D1	Kývalka – Holubice	Insufficient capacity	
D1	Říkovice – Lipník nad Bečvou	Missing segment	
D1	Bohumín – Polish border	Segment put to operation only for passenger cars	Non operational section A1 in Poland
R1	Prague Ring Road, south-east, east and north segments	Missing + unacceptable segment	
D8	Bílinka – Řehlovice	Missing segment	Segment under construction
D11	Hradec Králové – Jaroměř	Missing segment	
R11	Jaroměř – Polish border	Missing segment	
R49	Hulín – Slovak border*	Missing segment	
R52	Pohořelice – Austrian border	Unsatisfactory (missing) segment	

* - added to Core Network when discussing original 2011 document

Table 20.14 – Deficiencies in TEN-T Core Network

Road no.	Section	Deficiency
D3	Prague - Mezno	Missing segment
D3	Veselí n.L. – Třebonín	Missing segment
R3	Třebonín – Austrian border	Missing segment
R6	Nové Strašecí – Karlovy Vary	Missing segment
R35	Ohrazenice (Turnov) – Hradec Králové	Missing segment
R35	Opatovice – Mohelnice	Missing segment
R43	Brno – Staré Město (R35)	Missing segment
R48	Bělotín – Dobrá u Frýdku-Místku	Unsatisfactory section/missing section outside the segments R48 Rychaltice – Frýdek-Místek and R48 Příbor bypass
R55	Olomouc – Přerov	Missing segment
R55	Otrokovice – Břeclav	Missing segment
I/68, I/11	Třanovice – Slovak border	Missing segment

Table 20.15 – Deficiencies in TEN-T Comprehensive Network

Road no.	Section	Deficiency
R4	Skalka – Mirotice	Missing segment
R7	Slaný – Panenský Týnec, start of bypass	Missing segment
R7	Panenský Týnec, end of bypass – Bítozeves interchange	Missing segment
R7	Interchange with I/27 – Chomutov	Missing segment

Table 20.16 – Deficiencies in motorway and expressway network – additional segments to those in TEN-T

20.2.2 Capacity deficiencies within the network

In order to identify the capacity deficiencies of the road network sections, we apply the strategic transport model of the CR developed as part of TSS2 and the connected transport forecasting model (Book 2 and Book 4).

Capacity deficiencies in the road network are identified based on the current state transport model calibrated using traffic volume data from the RMD 2010 National Traffic Count (NTC), which includes construction projects expected to be completed by 2014 (or slightly later) based on the SFTI budget for 2013, as well as using models plotting the transport relationships in outlook time horizons. We therefore model for the time horizons of 2014, 2020, 2035 and 2050.

No.	Road no.	Section start	Section end	2014	2020	2035	2050
1	D1	km 0	km 18	**	**	**	**
2	D1	km 18	km 182	*	*	*	*
3	D1	km 182	km 203	*	**	**	**
4	D1	km 203	km 230	*	*	*	**
5	D5	km 0	km 28	*	*	*	*
6	R10	km 39	km 46		*	*	*
7	R35	km 281	km 290			*	*
8	R1	intersection with D5, km 0	intersection with D1, km 10		*	*	*

* Potential capacity deficiencies (maximum LOS of C reached)

** Capacity deficiencies (segments significantly exceeding maximum LOS of C, i.e., reaching D and above)

Table 20.17 – Capacity deficiencies in motorway and expressway network

No.	Road no.	Section start	Section end	2014	2020	2035	2050
9	2	Uhříněves	Mukařov	**	**	**	**
10	3	intersection with D1	intersection with D3, km 62	**	**	**	**
11	3	Veselí nad Lužnicí	České Budějovice		*	*	**
12	3	České Budějovice	intersection with II/155	*	**	**	**
13	3	intersection with II/155	Dolní Dvořiště (Austrian border)		*	*	**
14	4	R4 exit 41	Milín	*	**	**	**
15	4	Milín	Mirotice		**	**	**
16	4	intersection with I/22	intersection with I/39		**	**	**
17	6	R6 exit 32	intersection with II/227			*	*
18	7	R7 exit 18	Panenský Týnec	*	**	**	**
19	7	Toužetín	Bitozeves	*	**	**	**
20	7	Křimov	German border		**	**	**
21	8	R63 exit 1	Teplice, intersection with I/13	*	**	**	**
22	9	Jestřebí	Nový Bor	*	*	**	**
23	9	intersection with II/268	Jiřetín pod Jedlovou	*	**	**	**
24	11	Hradec Králové	Doudleby nad Orlicí		*	**	**
25	11	intersection with I/59 Šenov	intersection with II/475, Havířov	*	**	**	**
26	11	Opava	Ostrava	*	*	*	*
27	12	Prague	Úvaly (intersection with II/101)		*	*	*
28	13	Ostrov	Klášterec nad Ohří (intersection with II/568)		*	*	*
29	13	Zelená	intersection with I/7		*	*	*
30	13	Bílina	Bílina	*	*	*	*
31	15	intersection with I/13 (Most)	intersection with D8, km 48 (Lovosice)		*	*	*
32	16	Intersects with I/35 (Úlibice)	Intersects with I/35 (Úlibice)			**	**

* Potential capacity deficiencies (maximum defined LOS, i.e., C or C-D, reached)

** Capacity deficiencies (segments significantly exceeding maximum defined LOS, i.e., reaching D or E)

Table 20.18 – Capacity deficiencies in first-class road network (Part 1)

No.	Road no.	Section start	Section end	2014	2020	2035	2050
33	16	Nová Paka	intersection with II/284 Nová Paka			**	**
34	16	intersection with I/7 (Slaný)	intersection with II/240 (Velvary)			*	*
35	16	intersection with I/35 (Jičín)	Jičín, Robousy	*	*	**	**
36	19	intersection with I/29	intersection with II/603		*	**	**
37	20	intersection with D5, km 76	intersection with I/19	*	**	**	**
38	20	intersection with I/19	intersection with II/188		*	*	*
39	20	intersection with I/29 (Písek)	intersection with II/122		**	**	**
40	20	intersection with II/145	intersection with II/105 (Č. Budějovice)		*	**	**
41	23	intersection with D1, km 182	Náměšť nad Oslavou			*	*
42	26	intersection with D5, km 89	Horšovský Týn			*	*
43	27	end of 4-lane layout	Vysoká Libyně		*	*	
44	27	end of 4-lane layout	Švihov	**	**	**	**
45	33	intersection with I/35	Jaroměř	*	**	**	**
46	33	Jaroměř	Polish border	*	**	**	**
47	34	intersection with D1, km 90	intersection with I/19, Pelhřimov	*	**	**	**
48	35	Hořice	Hradec Králové	*	*	**	**
49	35	Hradec Králové	Holice		*	*	*
50	35	Holice	intersection with II/366	*	**	**	**
51	35	intersection with I/34	Mohelnice		**	**	**
52	35	Prostřední Bečva	Slovak border			*	**
53	36	Pardubice through road (intersection with I/37)	end of Pardubice/ Sezemice		*	*	*
54	37	intersection with I/33 (Jaroměř)	intersection with I/16 (Trutnov)		*	*	*
55	37	Březhrad	Opatovice nad Labem		*	*	*
56	37	Pardubice	Nasavrky		*	*	*
57	38	Nymburk (intersection with II/330)	intersection with I/12 (Kolín)		*	**	**
58	38	Kolín (intersection with I/12)	Habry (intersection with II/346)	*	**	**	**
59	38	Havlíčkův Brod (intersection with I/34)	intersection with D1, km 112		*	**	**
60	38	intersection with II/523	Austrian border		*	*	**
61	43	Lelekovice	intersection with I/19	*	**	**	**
62	44	Mohelnice	Zábřeh	*	*	**	**
63	46	Šternberk	Horní Loděnice			*	*
64	49	Lípa	Vizovice			*	*
65	50	intersection with D1, km 210	Kožušice		*	**	**
66	53	intersection with R52, km 26	intersection with II/415		**	**	**
67	55	Uherské Hradiště	Otrokovice			*	*
68	55	Říkovice	Olomouc			*	*
69	61	intersection with R7, km 7	intersection with II/101, Kladno		*	*	*
70	57	Valašské Meziříčí	Jablůnka		*	**	**
71	68	intersection with R48, km 62	intersection with I/11			*	*
72	69	Vizovice (intersection with I/49)	Jasenná				*

* Potential capacity deficiencies (maximum defined LOS, i.e., C or C-D, reached)

** Capacity deficiencies (segments significantly exceeding maximum defined LOS, i.e., reaching D or E)

Table 20.19 – Capacity deficiencies in first-class road network (Part 2)

20.2.3 Deficiencies on first-class through-traffic roads

A significant deficiency of many first-class roads is the urban through sections of these roads, which have a negative effect on the local quality of life as well as traffic fluency and safety. That is why we have analysed these places, see 22.2.3 below, in order to identify the need to build bypasses on first-class roads as assigned.

20.2.4 Accident-ridden places

A separate chapter is dedicated to traffic accident issues, as assigned. The issue is handled comprehensively in 28.1.2 below.

20.2.5 Environmental deficiencies in the existing network

The search for environmental deficiencies in the existing network was also part of the analyses performed under TSS2. The attention was focused on the following two areas:

- shifting traffic to more environmentally friendly modes, and
- segments in the existing network with adverse environmental impacts.

20.3 Waterway infrastructure

The deficiencies in the waterway network are analysed from the following fundamental points of view:

- deficiencies due to incomplete network
- network capacity deficiencies
- deficiencies due to waterway parameters (gabarits, draughts, underpass clearances, daily/annual exploitability)
- port infrastructure capacity deficiencies (freight/passenger)
- deficiencies due to navigation fluency and safety

20.3.1 Deficiencies due to incomplete network

Waterway	Section	Deficiency
Elbe	Chvaletice-Pardubice	Missing lock (Přelouč II)

Table 20.20 – Deficiencies due to incomplete TEN-T waterway network (Core Network)

Waterway	Section	Deficiency
Vltava	České Budějovice-Týn nad Vltavou	Missing lock chambers (Hluboká, Hněvkovice), missing lock (Hněvkovice II) – in progressive execution
Vltava	Týn nad Vltavou-Slapy (Třebenice)	Missing boat lifts at Orlík and Slapy
Baťa Canal	Skalica-Morava River	Missing lock chamber at Rohatec and navigation route (Radějovka)
Baťa Canal	Bělov-Kroměříž	Missing lock chamber at Bělov

Table 20.21 – Deficiencies due to incomplete other waterway networks

The Danube-Oder-Elbe connection is in a long-term perspective considered link in the European inland waterway network. It is included in the Accession Treaty of the CR (and other countries) to the EU (AA 2003/ACT/Annex II/CS/1645, AA 2003/ACT/ Annex II/CS/1648), Decision No 661/2010/EU of the European Parliament and of the Council of 7 July 2010 on Union guidelines for the development of the trans-European transport network (TEN-T) (without continued in Poland along the river Oder), and the ratified European Agreement on Main Inland Waterways of International Importance (AGN).

The DOE project is not handled in this document. It is a concept extending beyond the border of CR. DOE is subject to a special regime, under which a Feasibility Study is being prepared pursuant to Government Resolution no. 155 of 14 March 2012, to be followed by separate documents and a SEA.

20.3.2 Network capacity deficiencies

The waterway network capacity deficiencies are identified based on the actual technical and operating conditions.

Waterway	Section	Deficiency
Vltava	Mělník-Prague/Jiráskův bridge	Insufficient capacity of Prague-Smíchov lock chamber

Table 20.22 – Waterway capacity deficiencies, TEN-T (Core Network)

20.3.3 Deficiencies due to waterway parameters

Waterway	Section	Deficiency
Elbe	German border - Střekov	unreliable draught conditions, dropping below exploitable (defined) minimum
Elbe	Střekov-Mělník	draught conditions not up to class IV; standard underpass clearances of 6.5 m not achieved year-round
Elbe	Mělník-Přelouč	unstable draught conditions at Chvaletice port; route draught conditions not up to class IV (not urgent)
Elbe	Přelouč-Pardubice	insufficient draught conditions above Přelouč weir; unreliable lock chamber at Srnojedy + impassable roadsteads; minimum underpass clearance of the Valy-Mělice bridge
Vltava	Mělník-Prague/Jiráskův bridge	draught conditions not up to class IV (not urgent); limited underpass clearances between Mělník and Prague-Holešovice; insufficient lock chamber widths (notably the pounds) prohibiting navigation by vessels 11.5 m wide
Vltava	Prague/Jiráskův bridge-Slapy (Třebenice)	limited draught, navigation straits; dangerous entrance to upper roadstead of Prague-Modřany lock chamber; limited underpass clearance

Table 20.23 – Deficiencies due to waterway parameters, TEN-T

Waterway	Segment	Deficiency
Vltava	Slapy (Třebenice) – České Budějovice	Limited length of lock at Kamýk n/Vlt; strait at Kořensko

Table 20.24 – Deficiencies due to waterway parameters, other waterways (besides TEN-T)

20.3.4 Port infrastructure capacity deficiencies (freight/passenger)

Waterway	Section	Deficiency
Elbe	Střekov-Mělník	unacceptable wall at Lovosice-Prosmyky port
Elbe	Mělník-Přelouč	insufficient development of port industrial zones
Elbe	Přelouč-Pardubice	missing port at Pardubice
Vltava	Mělník-Prague/Jiráskův bridge	insufficient development of port industrial zones
Vltava	Prague/Jiráskův bridge-Slapy (Třebenice)	missing port at Prague-Radotín

Table 20.25 – Port infrastructure capacity deficiencies, freight navigation

Waterway	Section	Deficiency
Elbe	German border - Střekov	missing public berths for passenger navigation; missing safe water entrances for small-scale recreational boating
Elbe	Střekov-Mělník	missing public berths for passenger navigation; missing safe water entrances for small-scale recreational boating; missing service centres for fuelling and waste collection
Elbe	Mělník-Přelouč	missing public berths for passenger navigation; missing safe water entrances for small-scale recreational boating; missing service centres for fuelling and waste collection
Elbe	Přelouč-Pardubice	missing public berths for passenger navigation in Pardubice; missing marina for small recreational vessels, incl. service facilities in Pardubice
Vltava	Mělník-Prague/Jiráskův bridge	missing public berths for passenger navigation; missing safe water entrances for small-scale recreational boating
Vltava	Prague/Jiráskův bridge-Slapy (Třebenice)	missing public berths for passenger navigation; missing safe water entrances for small-scale recreational boating; missing service centres for fuelling and waste collection

Table 20.26 – Port infrastructure capacity deficiencies, passenger navigation

Waterway	Section	Deficiency
Vltava	České Budějovice- Slapy (Třebenice)	missing public berths for passenger navigation; missing safe water entrances for small-scale recreational boating; missing service centres for fuelling and waste collection
Baťa Canal	Entire route	public berth completion; addition of ports with service facilities

Table 20.27 – Other waterways - Port infrastructure capacity deficiencies, passenger navigation

20.3.5 Deficiencies due to navigation fluency and safety

Waterway	Segment	Deficiency
Elbe	Střekov-Mělník	missing network of bridge labelling for navigation using radio locators
Elbe	Mělník-Přelouč	missing emergency vessel protection; insufficient reliability of lock operation, long downtimes
Elbe	Přelouč-Pardubice	missing waiting berths by some locks; waiting berths for small vessels missing by most locks
Vltava	Mělník-Prague/Jiráskův bridge	insufficient reliability of lock operation, long downtimes; missing emergency vessel protection; missing network of bridge labelling for navigation using radio locators
Vltava	Prague/Jiráskův bridge-Slapy (Třebenice)	missing emergency vessel protection (Štěchovice)

Table 20.28 – TEN-T, deficiencies due to navigation fluency and safety

20.4 Aviation infrastructure

From the point of view of the objectives defined in Book 5, attention is focused on the following areas:

- Airport network of optimum size
- Good access to airports using other modes
- Provision of sufficient airspace capacity and safety

The Czech Republic currently has 91 civilian airports and airfields. Approximately one quarter of them has hard runways; they total 22. The remaining 69 airfields only have running tracks and are mostly intended for sports aviation.

With the sole exception of Vaclav Havel Airport Prague, none of the other major airports are state-owned (this exception being a joint stock company anyway). The others are owned by regional and municipal authorities and private entities.

The airports with the biggest development potential include the following international airports:

- Praha Ruzyně – LKPR
- Ostrava / Mošnov – LKMT
- Brno / Tuřany – LKTB
- Karlovy Vary / Olšová Vrata – LKKV
- Pardubice – LKPD
- Vodochody – LKVO
- Kunovice – LKKU

Furthemore, the following can be added:

- Přerov / Bochoř airport – LKPO
- České Budějovice airport – LKCS
- Hradec Králové airport – LKHK

Vaclav Havel Airport Prague and Ostrava / Mošnov airports are included in the current version of the TEN-T Core[8] Network; Brno / Tuřany Airport is part of the TEN-T Comprehensive Network.

- **In terms of the extent of the airport network, the current state cannot be classified as inadequate given the above.**
- As for the capacity of each of the airports, our attention focuses on the single airport owned by the state, which is Vaclav Havel Airport Prague. Here, a **potential problem in terms of the airport runway system capacity may be identified for the outlook years** (not the airport itself; it is the runway system that limits its capacity). Financing of this plan is expected to be from own

[8] Taking into account its performances, the Leos Janacek airport belongs to the TEN-T Core Network, however without the obligation to be directly linked to the railway network.

sources of the airport, and thus resources from the state budget will not be claimed.

- As for the air navigation services, the fact that **the currently operating system for providing air navigation services (EUROCAT 2000) appears to be inadequate in terms of the hardware capacity and service life** can be seen as a deficiency, and the situation is further aggravated by unavailability of spare parts and components. The service life of the system is limited by the year 2018.
- Accesibility of airports by means of the other transport modes is (especially from the point of view of the railway infrastructure) studied within the infrastructure of these modes, not within the aviation infrastructure. The remaining two objectives then focus on optimal dimensioning of the airport network with sufficient/adequate capacity of each of them, but they also cover the area of air traffic control.

21 Information functional to measures identification

The purpose of the process of identification of measures in the transport networks is primarily to find such measures that would resolve the deficiencies. However, in line with the Contracting authority's requirement, the latter stages of the project has been working with all the measures identified, including those that do not resolve any of the deficiencies but are pursued by the investors.

Databases of measures in the transport networks for each mode are drawn up under TSS2. The foundation for these databases comes from the infrastructure managers; however, each of the databases has been completed with a number of additional measures in the course of the work, and new relevant information has been added to some of the adopted measures that characterised them more closely.

The primary identification of the infrastructural measures is grounded in several fundamental relevant sources:

- the State Fund for Transport Infrastructure budget for 2012 and the medium-term outlook for 2013 and 2014 approved by the Chamber of Representatives of the Parliament of the Czech Republic in its Resolution no. 919 at its 32nd session on 14 December 2011 with modification proposals reflected;
- the draft State Fund for Transport Infrastructure budget for 2013 and the medium-term outlook for 2014 and 2015;
- the Railway Infrastructure Administration: information on the RIA's development plans, originally summarised in so-called Project Cards (complete database used during the works);
- the Road and Motorway Directorate: information on its development plans;
- the Waterways Directorate;
- the Spatial Development Policy of the Czech Republic 2008 (the wording approved by Government Decree No. 929 of 20 July 2009, incl. related documents).

In addition to the above, the Consultant works with information from other relevant source institutions involved in transport infrastructure development, namely:

- the Ministry of Transport of the Czech Republic, Unit 130: information on development of the backbone railway network until 2040;
- the Ministry of Transport of the Czech Republic, Unit 190: plan of transport services provided by national trains (rules for ordering long-distance transport for 2012-2016);
- other units of the Ministry of Transport of the Czech Republic;
- regional authorities and Prague Municipal Authority (incl. information from entrusted transport organisers if any in the regions):
    - plans of transport services;
    - strategic papers concerning transport services and infrastructure;

- spatial development rules;
- questionnaires and meetings.

22 Identification of measures resolving the deficiencies

Deficiencies in the transport networks the identification of which is described in the previous chapters are now scrutinised for possible elimination or implementation of measures that would eliminate them.

22.1 Railway infrastructure

Based on the analysis of the deficiencies in the railway network, the database of railway infrastructure measures was completed with the below additional items that had not been contained in any of the measures pursued thus far.

Limitation no.	Segment	Line	Description	Measure proposed
ZUM022	RL Prague – Wroclaw	RL	Proposal of a new Prague – Wroclaw line arising from the draft TEN-T as a measure by 2050	Z262
ZUM027	PJ - Prague-Radotín - Prague-Malešice - Prague-Běchovice	PJ	Upgrade of the freight link between Transit Railway Corridors 1 and 3; measure required for developing urban rail transit	Z263

Table 22.29 – Measures resolving gaps and deficiencies in TEN-T

Limitation no.	Segment	Line	Description	Measure proposed
ZUP007	Most – Vrbka Fork	123	Platform arrangement at Počerady Station and other unacceptable places along the line	Z264
ZUP032	Česká Třebová – Brno	260	Platform arrangement at Adamov, Rájec-Jestřebí, Letovice, Březová nad Svitavou, Opatov and other unacceptable places along the line	Z265
ZUP038	Brno – Veselí nad Moravou	340	Platform arrangement at stations and other unacceptable places along the line chiefly between Nesovice and Veselí nad Moravou	Z266
ZUP039	Brno-Maloměřice	BJ	Modifications to freight train facilities, provision of clearance profile	Z267

Table 22.30 – Measures resolving insufficient parameters in TEN-T and other selected lines

Limitation no.	Segment	Line	Description	Measure proposed
ZUK002	Choceň - Pardubice Main Station	010	Railway line modification	Z053
ZUK003	Pardubice Main Station – Kolín	010	Railway line modification	Z053
ZUK004	Kolín – Poříčany	011	New line / line track addition	Z055
ZUK005	Poříčany - Prague-Běchovice	011	New line / line track addition	Z055
ZUK006	Prague-Běchovice - Prague-Libeň	011	Line link outside Prague-Malešice Station	Z098
ZUK007	Choceň - Vysoké Mýto město	018	Revitalisation	Z102
ZUK008	Častolovice - Týniště n. O.	021	Capacity increase - track addition	Z064
ZUK009	Častolovice - Rychnov n. K.	022	Capacity increase - track addition	Z064
ZUK010	Václavice – Náchod	026	New link between lines 032 and 026	Z067
ZUK018	Smržovka - Josefův Důl	034	Track reconstruction	Z125
ZUK021	Liberec - Frýdlant v Č.	037	Revitalisation	Z140
ZUK022	Hradec Králové – Hněvčeves	041	Revitalisation	Z150
ZUK023	Jičín – Kopidlno	061	Revitalisation	Z172
ZUK025	Mladá Boleslav město - Dolní Bousov	064	Revitalisation	Z181
ZUK030	Čelákovice - Brandýs n.L. - Neratovice	074	Revitalisation	Z183
ZUK035	Lovosice – Litoměřice	087	Revitalisation	Z206
ZUK036	Liberec - Hrádek n.N.	089	Revitalisation and line modification	Z207
ZUK037	Ústí nad Labem Main Station	090	Station modification	Z258
ZUK042	Kladno-Ostrovec - Kralupy n. Vlt.	093	Revitalisation	Z235
ZUK043	Děčín-Prostřední Žleb Station	098	Station modification	Z259
ZUK052	Cheb – Mar. Lázně - Chodová Planá	170	Railway line modification	Z260
ZUK063	České Budějovice – Rožnov Fork	194	Capacity increase (partial track doubling or new line)	Z261
ZUK065	Světlá n.S. - Zruč n.S.	212	Revitalisation	Z232
ZUK070	Kolín Station (for Velim - Kutná Hora)	230	New link between 011-230	Z250
ZUK073	Balabenka Fork	231	Capacity increase - track addition	Z254
ZUK088	Červenka – Prostějov	273	Revitalisation	Z255
ZUK095	Ostrava-Svinov - Opava východ	321	Capacity increase - track addition	Z256
ZUK103	Liberec Station	030,036,037 086,089	Junction reconstruction	Z257

Table 22.31 – Measures resolving insufficient capacity in the railway network

22.2 Road infrastructure

Deficiencies in the existing road network were then subjected to a detailed analysis. It resulted in the assignment of measures to respective road network deficiencies.

Road no.	Segment	Measures
D1	Mirošovice – Kývalka	S344 – S364
D1	Kývalka – Holubice	S219 – S223
D1	Říkovice – Lipník nad Bečvou	S202, S203
D1	Bohumín – Polish border (opening soon)	-
R1	Prague Ring Road – east and north portions	S198, S199, S200, S201, 248
D8	Bílinka– Řehlovice (under construction)	D8 D805 – under construction
D11	Hradec Králové – Jaroměř	S183, S184
R11	Jaroměř – Polish border	S185, S186
R49*	Hulín – Slovak border (Hulín – Fryšták under construction)	R49 Hulín – Fryšták under construction, S214, S215, S216, S217, S218
R52	Pohořelice – Austrian border	S002, S003, S004

* - added to Core Network when discussing original 2011 document

Table 22.32 – Measures resolving deficiencies in TEN-T Core Network

Road no.	Segment	Measures
D3	Prague - Mezno	S187, S188, S189, S190, S191
D3	Tábor – Třebonín (Tábor – Veselí nad Lužnicí under construction)	S192, S193, S194, S195, S196, S197
R3	Třebonín – Austrian border	S134, S135, S136
R6	Nové Strašecí – Karlovy Vary (Lubenec – Bošov under construction)	S138, S139, S140, S141, S142, S143, 144, S145, S146, S148, S371
R6	Cheb – German border	-
R35	Ohrazenice (Trutnov) – Hradec Králové	S478, S154, S287, S288, S289
R35	Opatovice – Mohelnice	S292, S293, S295, S296, S297, S298, S299, S343
R43	Brno – Staré Město (R35)	S165, S301, S321, S322
R48	Bělotín – Frýdek-Místek (Rychaltice – Frýdek-Místek under construction)	S155, S156, S157, S158
R55	Olomouc – Přerov	S204, S205
R55	Otrokovice – Břeclav	S062, S206, S207, S208, S209, S210, S211, S212, S213
I/68, I/11	Třanovice – Slovak border	S071, S072, S073

Table 22.33 – Measures resolving deficiencies in TEN-T Comprehensive Network

Road no.	Segment	Measures
R4	Skalka – Mirotice	S129-S33, S137
R7	Slaný – Panenský Týnec, začátek obchvatu	S149, S150
R7	Panenský Týnec, konec obchvatu – MÚK Bítozeves	S151 – S153, S375
R7	MÚK s I/27 – Chomutov	Under construction

Table 22.34 – Measures resolving deficiencies in motorway and expressway network – segments additional to those in TEN-T

22.2.1 Access time analysis

In order to verify the necessity of the above measures, we analysed the access times along the routes in question and then compared it with the access times after the planned measures are implemented along the routes.

The analysis was performed using the transport model created as part of the TSS2 project.

Source	Destination	Road improving connection parameters	Access time band - present day	Access time band – outlook
Prague	České Budějovice	D3, R4	1hr 55min	1hr 30min
Prague	Karlovy Vary	R6	1hr 55min	1hr 30min
Prague	Ostrava	D1, R35	4hr	3hr 30min
Prague	Chomutov	R7	1hr 20min	1hr 10min
Brno	Střelná, Slovak border	R49	1hr 35min	1hr 10min
Brno	Intersection with I/35 (Svitavy)	R43	1hr 10min	1h
Brno	Mikulov, Austrian border	R52	40min	35min
Ostrava	Jablunkov, Slovak border	R67, I/68, I/11	45min	35min
Olomouc	Český Těšín	R48	1hr 10min	1hr 10min
Olomouc	Liberec	R35	3hr 20min	2he 20min
Olomouc	Břeclav	R55, D1	1hr 20min	1hr 10min
Hradec Králové	Královec, Polish border	D11, R11	56min	35min

Table 22.35 – Access times, overview of analyses performed

22.2.2 Measures resolving capacity deficiencies within the network

Two basic types of measures have been identified:

- Directly related measures – Measures implemented within immediate distance of the identified capacity deficiency (typically replacement of a 1st class road with a motorway)
- Indirectly related measures – Measures implemented in other location which, according to the transport model results, has significant positive impact on the on the deficiency.

No.	Road no.	Potential capacity deficiency / Capacity deficiency		Measures		Time horizon (max. LOS defined achieved)	Time horizon (max. LOS exceeded)
		Segment start	Segment end	Directly related	Indirectly related		
1	D1	km 0	km 18	S232, S187, S189, S190, S476, S622	R35 (S292-S293, S295-S299, 343), D3 (S187-S191)	2014	2014
2	D1	km 18	km 182	S257, S344-S364, S307-S308	R35 (S292-S293, S295-S299, 343)	2014	after 2050
3	D1	km 182	km 210	S219-S223	R35 (S292-S293, S295-S299, 343)	2014	2020
4	D1	km 210	km 230	-	R35 (S292-S293, S295-S299, 343)	2014	2050
5	D5	km 0	km 28	-	-	2014	after 2050
6	R10	km 39	km 46	-	R35 (S478, S287-S289, S183, S292-S293, S295-S299)	2020	after 2050
7	R35	km 281	km 290	-	S202, S203	2035	after 2050
8	R1	intersection with D5, km 0	intersection with D1, km 10	-	S198-S199, S200-S201, S380, D3 (S187-S191)	2020	after 2050

Table 22.36 – Measures resolving capacity deficiencies in motorway and expressway network

No.	Road no.	Potential capacity deficiency / Capacity deficiency		Measures		Time horizon (max. LOS defined achieved)	Time horizon (max. LOS exceeded)
		Segment start	Segment end	Directly related	Indirectly related		
9	2	Uhříněves	Mukařov	S625	Regional projects, Prague Ring Road completion (S198-S199, S200-S201, S380)	2014	2014
10	3	intersection with D1	intersection with D3, km 62	S250, S372, S012, S187-S191 /S251, S476, S583, S251	-	2014	2014
11	3	Veselí nad Lužnicí	České Budějovice	S192-S195, S262, S570	-	2020	2050
12	3	České Budějovice incl. through road	intersection with II/155	S196-S197	-	2014	2020
13	3	intersection with II/155	Dolní Dvořiště (Austrian border)	S134-S136, S568-S569	-	2020	2050
14	4	R4, exit 41	Milín	S130-S131, S584	D3 (S187-S191, 192-197, 134-136)	2014	2020
15	4	Milín	Mirotice	S129, S132, S133-staví se, S137, S585	D3 (S187-S191, 192-197, 134-136)	2020	2020
16	4	intersection with I/22	intersection with I/39	S523	D3 (S187-S191, 192-197, 134-136)	2020	2020
17	6	R6, exit 32	intersection with II/227	S138-S141, S586	-	2035	after 2050
18	7	R7, exit 18	Panenský Týnec	S149-S150	-	2014	2020
19	7	Toužetín	Bitozeves	S151-S153, S375	-	2014	2020
20	7	Křimov	German border	S091	-	2020	2020
21	8	R63 exit 1	Teplice intersection with I/13	S037	D8 (805)	2014	2020
22	9	Jestřebí	Nový Bor	S040, S043, S513, S618	S521	2014	2035
23	9	intersection with II/268	Jiřetín pod Jedlovou	S039, S286, S629	-	2014	2020
24	11	Hradec Králové	Doudleby nad Orlicí	S488, S487, S056	-	2020	2035
25	11	intersection with I/59 Šenov	intersection with II/475 Havířov	S397	-	2014	2020
26	11	Opava	Ostrava	S376, S426-S427, S444-S445	-	2014	after 2050
27	12	Prague	Úvaly (intersection with II/101)	S006	-	2020	after 2050
28	13	Ostrov	Klášterec nad Ohří (intersection with II/568)	S492, S516, S173	-	2020	after 2050

*** Defined LOS only achieved in the years shown.*

Table 22.37 – Measures resolving capacity deficiencies in road network (Part 1)

No.	Road no.	Potential capacity deficiency / Capacity deficiency		Measures		Time horizon (max. LOS defined achieved)	Time horizon (max. LOS exceeded)
		Segment start	Segment end	Directly related	Indirectly related		
29	13	Zelená	intersection with I/7	S610	-	2020	after 2050
30	13	Bílina	Bílina	S035	-	2014	after 2050
31	15	intersection with I/13 (Most)	intersection with D8, km 48 (Lovosice)	-	D8 (805), R7 (S149-153, S375	2020	after 2050
32	16	intersection with I/35 (Úlibice)	intersection with I/35 (Úlibice)	S478, S154	-	2035	2035
33	16	Nová Paka	intersection with II/284 Nová Paka	S053	-	2035	2035
34	16	intersection with I/7 (Slaný)	intersection with II/240 (Velvary)	S005	-	2035	after 2050
35	16	intersection with I/35 (Jičín)	Jičín, Robousy	S478	-	2014	2035
36	19	intersection with I/29	intersection with II/603	S526, S576, S615, S617	-	2020	2035
37	20	intersection with D5 km 76	intersection with I/19	S268, S277	-	2014	2020
38	20	intersection with I/19	intersection with II/188	S268, S503 - S505	-	2020	after 2050
39	20	intersection with I/29 (Písek)	intersection with II/122	S527, S630	D3 (S187-S191, 192-197, 134-136)	2020	2020
40	20	intersection with II/145	intersection with II/105 (Č. Budějovice)	S259, S527	D3 (S187-S191, 192-197, 134-136)	2020	2035
41	23	intersection with D1, km 182	Náměšť nad Oslavou	S605, S406	-	2035	after 2050
42	26	intersection with D5, km 89	Horšovský Týn	S267, S273, S023, S501, S498, S589	-	2035	after 2050
43	27	end of 4-lane layout	Vysoká Libyně	S266	-	2020, 2035 **	after 2050
44	27	end of 4-lane layout	Švihov	S022, S276, S592	-	2014	2014
45	33	intersection with I/35	Jaroměř	S183, S184	-	2014	2020
46	33	Jaroměř	Polish border	S051, S054, S631	S185-S186	2014	2020
47	34	intersection with D1, km 90	intersection with I/19 Pelhřimov	S626	-	2014	2020
48	35	Hořice	Hradec Králové	S287, S289, S488, S608	-	2014	2035
49	35	Hradec Králové	Holice	S293	-	2020	after 2050

50	35	Holice	intersection with II/366	S292, S295 - S298, S559, S598, S558, S597, S557	-	2014	2020

*** Defined LOS only achieved in the years shown.*

Table 22.38 – Measures resolving capacity deficiencies in road network (Part 2)

No.	Road no.	Potential capacity deficiency / Capacity deficiency		Measures		Time horizon (max. LOS defined achieved)	Time horizon (max. LOS exceeded)
		Segment start	Segment end	Directly related	Indirectly related		
51	35	intersection with I/34	Mohelnice	S299, S343	-	2020	2020
52	35	Prostřední Bečva	Slovak border	-	R49 (S379, S214-S218)	2035	2050
53	36	Pardubice – through road (intersection with I/37)	end of Pardubice/ Sezemice	S044-S046, S481, S176, S096	-	2014	after 2050
54	37	intersection with I/33 (Jaroměř)	intersection with I/16 (Trutnov)	S184-S186, S599, S563	-	2020	after 2050
55	37	Březhrad	Opatovice nad Labem	under construction	-	2020	after 2050
56	37	Pardubice	Nasavrky	S047-S048	-	2020	after 2050
57	38	Nymburk (intersection with II/330)	intersection with I/12 (Kolín)	S472, S477*	-	2020	2035
58	38	Kolín (intersection with I/12)	Habry (intersection with II/346)	S473, S011, S082, S587	-	2014	2020
59	38	Havlíčkův Brod (intersection with I/34)	intersection with D1, km 112	S049, S409	-	2020	2035
60	38	intersection with II/523	Austrian border	S419-S420, S453-S455, S368, S064, S312, S451, S580, S633, S634	-	2020	2050
61	43	Lelekovice	intersection with I/19	S165, S321-S322, S538, S539	-	2014	2020
62	44	Mohelnice	Zábřeh	S428-S429	-	2014	2035
63	46	Šternberk	Horní Loděnice	S438	-	2035	after 2050
64	49	Lípa	Vizovice	S379, S214-S216, S616	-	2035	after 2050
65	50	intersection with D1, km 210	Kožušice	S063, S543, S458, S459, S628	-	2020	2035
66	53	intersection with R52, km 26	intersection with II/415	S627	-	2020	2020
67	55	Uherské Hradiště	Otrokovice	S062, S206, S207, S548	-	2035	after 2050
68	55	Říkovice	Olomouc	S202-S205, S325, S121, S555	-	2035	after 2050
69	61	intersection with R7, km 7	intersection with II/101 Kladno	S469, S635	-	2020	after 2050
70	57	Valašské Meziříčí	Jablůnka	S334, S061, S389	-	2020	2035

71	68	intersection with R48, km 62	intersection with I/11	S071	-	2035	after 2050
72	69	Vizovice (intersection with I/49)	Jasenná	S620	-	2050	after 2050

*** Defined LOS only achieved in the years shown.*

Table 22.39 – Measures resolving capacity deficiencies in road network (Part 3)

No.	Road no.	Segment start	Segment end	Measures	
				Directly related	Indirectly related
1	9	intersection with II/243 (Líbezníce)	intersection with II/101 (Neratovice)	S621	-
2	37	intersection with R11	intersection with I/16 Trutnov	S622	-
3	35	Valašské Meziříčí	Lešná	S370	-

Table 22.40 – Other capacity deficiencies in road network due to measures under transport model put into operation, and measures resolving these capacity deficiencies

22.2.3 Measures resolving deficiencies on first-class through roads

In line with the assignment and as a follow-up on the assignment, we performed an analysis of first-class urban through roads, being environmental as well as other deficiencies.

The deficiencies were analysed and then characterised using the following attributes:

- first-class road type,
- annual average daily traffic volume in the 2010 national traffic counts (these data being more relevant for this analysis than the transport model data),
- population of the municipality on the through road,
- inclusion of a solution in SDO, and
- through road routing within municipality (centre/outskirts).

Complete results of the analysis of necessity of bypasses are included in the annexes to Book 6, published on the Internet. The investment preparation process will proceed according to these results. In Book 10, selected bypasses are incorporated to the time schedule of implementation depending on their respective priority.

22.3 Waterway infrastructure

Based on an analysis of deficiencies in the waterway network and their comparison with the database of measures of the WD, we can concluded that all of the deficiencies identified have been covered with investment measures. Conversely, each of the investment measures covers one of the deficiencies identified.

Measure no.	Measure name	Deficiency elimination					Water course
		Network completeness	Capacity	Parameters	Port infrastructure	Fluency & safety	
V001	Děčín weir			X			Elbe
V002	Přelouč II lock	X					Elbe
V003	Srnojedy lock chamber upgrade	x				X	Elbe
V004	Velký Osek HP, lock chamber upgrade					X	Elbe
V005	Brandýs nad Labem lock chamber upgrade					X	Elbe
V006	Road bridge across the Elbe between Valy and Mělice			X			Elbe
V007	Stabilization of navigation route at Chvaletice port			X			Elbe
V008	Pardubice public port				X		Elbe
V009	New commercial ports on the Elbe (Nymburk etc.)				X		Elbe
V010	Navigation signage adjustment on power lines across the Elbe, navigation signage upgrade on lock chambers					X	Elbe
V013	Lower Elbe wharfs, wave 2 (Roudnice nad Labem, Děčín - Smetanovo nábřeží)				X		Elbe
V015	Malé Žernoseky wharf				X		Elbe
V017	Mělník wharf				X		Elbe
V018	Passenger river transport berths on the Lower Elbe (6 sites)				X		Elbe
V020	Nymburk marina – berths for sports vessels and passenger river transport				X		Elbe
V021	Lázně Toušeň public port				X		Elbe
V022	Lower Elbe wharfs, wave 3 (5 sites)				X		Elbe
V023	Lower Elbe wharfs, wave 4 (7 site)				X		Elbe
V024	Middle Elbe wharfs (Neratovice, Brandýs, Čelákovice, Lysá, Poděbrady, Velký Osek + 4 more)				X		Elbe
V025	Kolín marina				X		Elbe
V027	Dolní Beřkovice lock chamber roadstead upgrade					X	Elbe
V028	Waiting berths for small vessels on the Elbe				X		Elbe
V029	Ústí nad Labem-Vaňov wharf				X		Elbe
V030	Pardubice marina				X		Elbe
V031	Service centre network on the Elbe				X		Elbe
V032	Water entrances on the Elbe				X		Elbe

Table 22.41 – Measures resolving capacity deficiencies on waterway network (Part 1)

Measure no.	Measure name	Deficiency elimination					Water course
		Network completeness	Capacity	Parameters	Port infrastructure	Fluency & safety	
V034	Protective berths on the Elbe Waterway					x	Elbe
V035	Prague-Old Town lock chamber		X				Vltava
V036	Hořín lock chamber pound upgrade			X			Vltava
V037	Navigation signage adjustment on bridges, installation of radar reflectors and signage on power lines across the Vltava					X	Vltava
V038	Increase in draught on the Vltava Waterway			X			Vltava
V039	Provision of safe underpass clearances on the Vltava Waterway			X			Vltava
V040	Adjustment to straits at Zbraslav, Štěchovice			X			Vltava
V041	Berths on the Vltava Waterway					X	Vltava
V044	Orlík boat lift	X					Vltava
V045	Slapy boat lift	X					Vltava
V046	Kamýk n.V. lock chamber extension			X			Vltava
V047	Štvanice lock chamber roadstead upgrade					x	Vltava
V048	Prague - Modřany lock chamber roadstead upgrade			X			Vltava
V049	Kořensko lock chamber roadstead upgrade			X			Vltava
V050	Completion of the Vltava waterway from Hněvkovice to Týn nad Vltavou	X					Vltava
V052	Hluboká n.V. port				x		Vltava
V053	Protective berths on the Vltava Waterway				X	X	Vltava
V054	Husinec u Řeže marina				X		Vltava
V055	Kralupy nad Vltavou marina				X		Vltava
V056	Prague wharfs wave 1 (6 sites)				X		Vltava
V057	Prague – Hodkovičky wharf				X		Vltava
V058	Wharfs between Prague and Slapy wave 2 (3 sites)				X		Vltava
V059	Štěchovice marina				X		Vltava
V060	Purkarec wharf				X		Vltava
V061	Wharfs between Mělník and Prague wave 1 (3 sites)				X		Vltava
V062	Davle wharf				X		Vltava
V063	Slapy and Orlík lake wharfs, wave 1 (Rabyně, Solenice, Zvíkovské Podhradí)				X		Vltava
V064	Waiting berths for small vessels on the Lower Vltava				X		Vltava
V065	Service centre network on the Vltava (7 sites)				X		Vltava
V067	Water entrances on the Vltava				X		Vltava
V068	Upgrade / construction of second lock chambers on the Lower Vltava (Mířejovice, Dolánky, Roztoky)			X		x	Vltava

Table 22.42 – Measures resolving capacity deficiencies on waterway network (Part 2)

Measure no.	Measure name	Deficiency elimination					Water course
		Network completeness	Capacity	Parameters	Port infrastructure	Fluency & safety	
V070	Navigability of the Berounka at Radotín (up to Černošice)	X					Berounka
V071	Extension of the Otrokovice - Rohatec - Rohatec lock waterway	X					BC
V072	Bělov lock chamber	X					BC
V073	Hodonín lock chamber	X					BC
V074	Petrov marina				X		BC
V075	Napajedla-Pahrbek marina				X		BC
V076	Baťa Canal wharfs – completion of basic network (3 sites) plus service centres				X		BC
V077	Lock chamber roadstead upgrades					X	BC
V078	Middle Elbe wharfs wave 2 (3 sites)				X		Elbe
V079	Poděbrady-Castle wharf				X		Elbe
V080	Nymburk-Drahelice port				X		Elbe
V081	Middle Elbe wharfs wave 3 (6 sites)				X		Elbe
V082	Middle Elbe wharfs between Přelouč and Pardubice (4 sites)				X		Elbe
V083	Prague-Braník-Ledárna port				X		Vltava
V084	Prague wharfs wave 2 (3 sites)				X		Vltava
V085	Prague-Holar wharf				X		Vltava
V086	Prague-National Theatre wharf				X		Vltava
V087	Prague wharfs wave 3 (3 sites)				X		Vltava
V088	Prague-Libeň port				X		Vltava
V089	Wharfs between Mělník and Prague wave 2 (5 sites)				X		Vltava
V090	Ždáň-Modrá loděnice wharf				X		Vltava
V091	Slapy and Orlík lake wharfs, wave 2 (2 sites)				X		Vltava
V092	Orlík-Castle wharf				X		Vltava
V093	Slapy and Orlík lake wharfs, wave 3 (5 sites)				X		Vltava
V094	Vltava wharfs between Týn n.V. and České Budějovice, wave 2 (2 sites)				X		Vltava
V095	Veselí nad Moravou marina				X		BC
V096	Kroměříž-airfield marina				X		BC
V097	Staré Město / Uherské Hradiště marina				X		BC
V098	Babice marina				X		BC
V099	Hodonín marina				X		BC
V100	Expansion of the RIS system under IRIS Europe III			x		x	-
V101	Exntension of infrastructure for radiotelephony at the Elbe-Vltava Waterway					x	-

Note: BC – Baťa Canal

Table 22.43 – Measures resolving capacity deficiencies on waterway network (Part 3)

22.4 Aviation infrastructure

As it has already been stated, the position of air transport is different from the other transport modes studied under TSS2. The problem is that the Ministry of Transport (or more precisely the Government) does not actually have any tool for regulating development of individual airports (except for determining technical conditions that must be met) because they fully lie within the authority of their owners who follow their own intentions and strategic plans. On the other hand, the Government (or more precisely SFTI) do not contribute any funds to the operation and development of airports.

The Ministry of Transport is working on the assignment for a commission titled "Air Transport Conception for 2014-2020". Due to the anticipated elaboration of this paper, independently dealing with the air transport, the Consultant of TSS2 does not aim at handling this topic in detail in TSS2 following an agreement with the Contracting authority.

Therefore, only two measures of national importance focusing on the aviation infrastructure development are considered hereunder as a part of TSS2. Contrary, attention is not paid to airports owned by other entities (especially regional authorities) because their importance should be evaluated by the above stated document.

With respect to their national importance, the following two measures have been identified as a result of the process of monitoring the measures for the navigation infrastructure:

- Parallel runway RWY 06R/24L, Prague Airport, Ruzyně
- Purchase of a new system for providing aviation operation services "Replacement of the Main System"

22.5 Public transport potential analysis

As part of the identification of measures resolving the deficiencies, an analysis of the potential for increasing demand for public transport was performed. It was done using the multimodal transport model drawn up as part of TSS2, where it was analyzed how much of the transport demand currently satisfied by private car transport will potentially shift to public transport. The approach outlined here is then consistently applied in Book 8 dealing with the assessment of measures.

The figure below (Figure 22.12) plots those relations where an increase in the number of services, reduction in travel time, reduction in waiting times for services, elimination of transfers, or a combination of these factors may result in a greater shift of traffic from private car transport. The cartogram shows relations with a relatively high quality of public transport service (such as Prague –

Pardubice); on the other hand relations where the service is of such good quality already that private car transport is very little used at present (such as Prague – Ostrava) are not shown.

The next figure (Figure 22.13) plots those relations where the public transport quality is already better at present, meaning the mode is used more than private car transport for the specified relations. The cartogram therefore also contains some degree of potential threat to public transport after changing the transport network quality. These relations lie mostly between Prague and North Moravia.

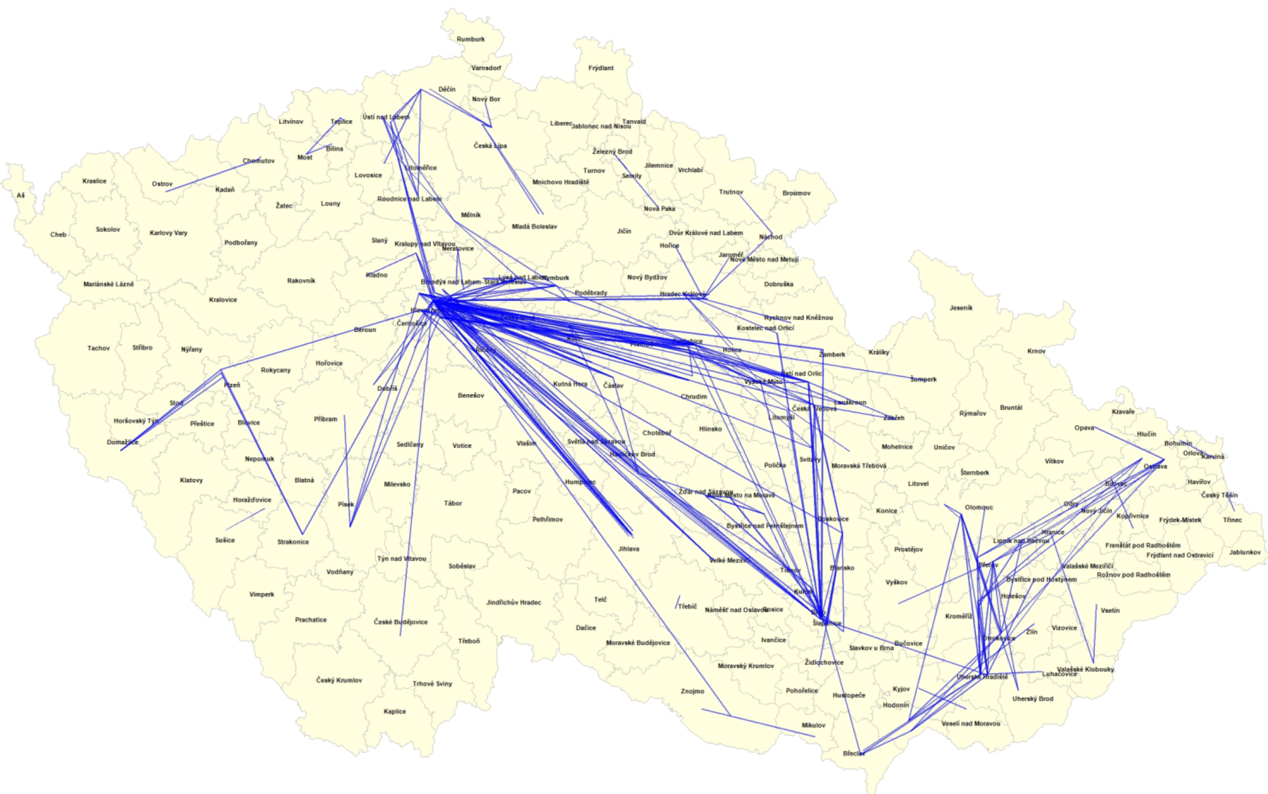


Figure 22.12 – Public transport relations of similar quality to car transport (chance to shift traffic from cars)

Figure 22.13 – Public transport relations of better quality than car transport (threat of traffic shift to cars)

23 Measure alternatives

The aim of the project Transport Sector Strategies, Phase 2, is not to propose alternative measures from the spatial development point of view, but rather to identify places where alternatives are considered or where a major change to an infrastructural measure cannot be ruled out before it is implemented and draw attention to the risks.

The time schedule for implementation of measures that is stated in final Book 10 already works with only one measure solving an established need. If the solution is not conclusive, the measure alternative that is to be implemented will be finally selected within a separate procedure organised under each project, specifically as a part of the procedures of the Feasibility Study development, land-use planning, EIA process and application for a planning permission procedure. The alternatives evaluated herein under only assess their functionality, with the accuracy corresponding to the national scale (including input data given by a transport model). The Transport Sector Strategies hence provide recommendations (indicate the need) for a given transport relation to be solved, however, do not give a binding position-statement on a selected routing alternative in a territory because their main mission is not to solve alternatives of all projects but to assess the importance of projects as the basic input for their prioritizing.

23.1 Railway infrastructure

Generally speaking, reasons for alternative designs of measures or clusters (sets of projects) in railway infrastructure may be as follows:

- external (outside the Ministry of Transport: design changes based on position statements of state administration or self-government bodies, as well as non-governmental, non-profit or environmental organisations, affected municipal and regional authorities, citizens' associations, etc.); and
- internal (within the Ministry of Transport: unclear design or scope of measures proposed in the course of preparation, economic inefficiency of the proposed measures , failure to meet conditions for project financing, etc.).

When identifying measures and grouping them into clusters, we identified the following types of alternative measures in railway infrastructure:

- measure alternatives (one or more measures within a cluster may have different designs or may be omitted altogether); and
- cluster alternatives (two or more clusters the simultaneous implementation of which cannot be envisaged).

The following reasons were found to be cardinal for the existence of alternative designs:

- alternatives due to routing: the definitive route has not been specified for the measure (alternative project spatial locations);
- alternatives due to scope: the definitive scope has not been specified for the measure (alternative total project scopes [length of track doubling/electrification] or operational uses with respect to project efficiency);
- alternatives due to strategy and concept: the overall concept of the infrastructural plan has not been definitively settled yet (final alternative not chosen, or strategy pursues a different alternative than the SDO, or a risk of this is identified).

Cluster no.	Cluster name	Remark
CZ014P	Brno Junction (Part 1)	A risk of conservation in existing location due to disapproval of NGOs and difficulty obtaining valid zoning and building permits in spite of project preparation to shift the Main Station to a different location. It depends on Feasibility study results.
CZ036N	Děčín – Všetaty – Kolín line upgrade	Identified possible alternative project scope and spatial location of the Mělník Link.
CZ040N	Ústí nad Labem – Cheb line upgrade	Identified possible alternative project scope (including spatial location of route near Karlovy Vary).
CZ041N	Pardubice - Havlíčkův Brod line revitalisation	Location-wise, there are alternative Pardubice – Chrudim routes either along existing line or a new route (Medlešice Link).
CZ055N	Velký Osek – Hradec Králové line modifications	Location-wise, there are still alternative routes for the Libice Link (concerning design speed and method of connecting to line 231).
CZ083N	Brno Junction (Part 2)	Connecting constructions of Brno Junction will depend on the Main Station location. The location of Brno Main Station will dictate the method of connecting other lines (notably 300 Brno – Přerov, 340 Brno – Veselí n.M., and RL1 Prague – Brno – Ostrava if any).
CZ110N	Plzeň Junction, Phase 2	Plzeň Junction has potential alternative locations for the marshalling yard (4th project and 5th project) - (either in current location or at Koterov.

Table 23.44 – Measure alternatives due to project spatial location (routing)

Cluster no.	Cluster name	Remark
CZ005P	Prague – České Budějovice line upgrade (TRC IV)	Identified possible alternative project scope for Nemanice – Ševětín.
CZ007P	Olomouc – Uničov – Šumperk line electrification	Identified possible alternative project scope for Uničov – Šumperk (without electrification).
CZ015P	Revitalisation of regional lines in Karlovy Vary Region, part 1	Identified possible alternative project scope (restoration of segment Loket předměstí - Krásný Jez)
CZ016P	Liberec – Tanvald – Harrachov line revitalisation	Identified possible alternative project scope for Smržovka – Josefův Důl (introduce 30-minute headways or not).

Table 23.45 – Measure alternatives due to project scope (Part 1)

Cluster no.	Cluster name	Remark
CZ019P	Prague – Lysá nad Labem line upgrade, part 1	Identified possible alternative project scope (reroutings) between Mstětice and Čelákovice (Lysá nad Labem – Prague-Vysočany, project 2).
CZ031N	Rapid link RL3 (Prague – Beroun)	Identified possible alternative project scope between Prague and Beroun (entire segment), incl. connection to Prague Junction.
CZ034N	Rapid link RL1 (Přerov – Ostrava)	Identified possible alternative project scope (Přerov bypass and connection to Ostrava-Svinov Station.
CZ038N	Hradec Králové – Trutnov/Náchod connection upgrade	Identified possible alternative project scope (scope of electrification on different lines).
CZ054N	Hradec Králové – Týniště n.O. – Letohrad line modifications, part 2	Identified possible alternative project scope (scope of track doubling and electrification).
CZ061N	Modifications to lines around Cheb	Identified possible alternative project scope (scope of track doubling and electrification).
CZ062N	Olomouc – Opava – Ostrava line upgrade	Identified possible alternative project scope (scope of track doubling and electrification).
CZ063N	Brno – Veselí n.M. line upgrade	Identified possible alternative project scope (scope of electrification, measures identified overlap).
CZ064N	Veselí n.M. – Horní Lideč / Vlárský průsmyk line upgrade	Identified possible alternative project scope (scope of electrification).
CZ067N	Prague Junction (segregation of suburban lines)	Identified possible alternative project scope (chiefly segregation of suburban lines).
CZ089N	Brno – Břeclav line modifications and electrification of connecting lines	Identified possible alternative project scope (scope of proposed measures depends on capacity addition between Brno and Břeclav).
CZ090N	Prague-Smíchov – Hostivice – Rudná u Prahy line modifications	Identified possible alternative project scope (scope of track doubling and electrification).
CZ094N	Liberec – Hrádek n.N. line modifications	Identified possible alternative project scope (scope of track doubling and electrification if any). Scope of proposed measures depends on cluster CZ073N and CZ126N.
CZ101N	Žďár n.S. – Tišnov line upgrade	Scope of proposed measures depends on cluster CZ114P.
CZ108N	Kolín – Havlíčkův Brod – Brno line reconstruction	Scope of proposed measures depends on cluster CZ141N.
CZ114P	Tišnov – Nedvědice line electrification	Scope of proposed measures depends on cluster CZ101N.
CZ126N	Line electrifications around Liberec	Identified possible alternative project scope (scope of electrification). Scope of proposed measures depends on cluster CZ094N among other things.
CZ141N	Kolín – Havlíčkův Brod line upgrade	Identified possible alternative project scope (line reroutings between Leština u Světlé and Golčův Jeníkov). Proposed measures may be a subset of cluster CZ108N.
CZ142N	Plzeň – Cheb line modifications	Identified possible alternative project scope (scope of track doubling).

Table 23.46 – Measure alternatives due to project scope (Part 2)

<table>
<tr><th>Area no.</th><th>Cluster no.</th><th>Cluster name</th><th>Remark</th></tr>
<tr><td rowspan="2">1</td><td>CZ006P</td><td>Prague – Kladno / Ruzyně Airport line upgrade, part 1</td><td rowspan="2">Identified potential alternative project concept (method of connecting Prague Václav Havel Airport and scope of upgrades on connecting infrastructure constructions). Partial implementation of both clusters can be envisaged too.</td></tr>
<tr><td>CZ045N</td><td>Prague – Kladno / Ruzyně Airport line upgrade, part 2</td></tr>
<tr><td rowspan="2">2</td><td>CZ030N</td><td>Rapid link RL4 (Prague – Dresden)</td><td rowspan="2">Identified potential alternative project concept (alternative pursued by investor differs from route included in SDO; Louny and Most connections have alternative scopes).</td></tr>
<tr><td>CZ118N</td><td>HSL Prague - Dresden</td></tr>
<tr><td rowspan="3">3</td><td>CZ032N</td><td>Rapid link RL1 (Prague – Brno)</td><td rowspan="3">Identified potential alternative project concept (alternative pursued by investor [via Benešov] differs from route included in SDO [via Poříčany]; the scope of capacity increase between Prague and Kolín [Prague – Poříčany] depends on the final form of the new Prague – Brno line for project scope).</td></tr>
<tr><td>CZ049N</td><td>Capacity increase / new line Prague – Kolín</td></tr>
<tr><td>CZ119N</td><td>Prague – Brno HSL</td></tr>
<tr><td rowspan="3">4</td><td>CZ042N</td><td>Plzeň – Česká Kubice line upgrade</td><td rowspan="3">Identified potential alternative project concept (alternative upgrade to line 180 [DM Bahn] / connection via new line for Nuremberg / phases of electrification and track doubling on existing line 180). Partial implementation of multiple clusters can be envisaged too.</td></tr>
<tr><td>CZ109N</td><td>Rapid link RL3 (Beroun – Plzeň – German border)</td></tr>
<tr><td>CZ120N</td><td>Plzeň – Domažlice line electrification</td></tr>
<tr><td rowspan="4">5</td><td>CZ035N</td><td>Prague – Liberec link upgrade</td><td rowspan="4">Identified potential alternative project concept (alternative pursued by investor differs from route included in SDO; also identified potential scope alternatives). Partial implementation of multiple clusters can be envisaged too.
This set of measures may be affected by the final form of the new Prague – Wroclaw line (cluster CZ048N).</td></tr>
<tr><td>CZ053N</td><td>Prague - Všetaty line electrification and capacity increase</td></tr>
<tr><td>CZ123N</td><td>New line Prague – Mladá Boleslav</td></tr>
<tr><td>CZ145N</td><td>Všetaty – Turnov – Tanvald line electrification</td></tr>
<tr><td rowspan="2">6</td><td>CZ074P</td><td>New line Ústí nad Orlicí – Choceň</td><td rowspan="2">Identified potential alternative project concept (cluster efficiency and spatial permeability problems, alternative project scopes along existing route also possible [90 / 160 / 200 km/h]).</td></tr>
<tr><td>CZ125N</td><td>Ústí nad Orlicí – Choceň line upgrade</td></tr>
<tr><td rowspan="2">7</td><td>CZ072N</td><td>Děčín – Česká Lípa – Liberec line upgrade</td><td rowspan="2">Identified potential alternative project concept (scope of CZ072N depends on implementation of Rynoltice Link CZ073N).</td></tr>
<tr><td>CZ073N</td><td>Rynoltice Link</td></tr>
<tr><td rowspan="2">8</td><td>CZ097N</td><td>České Budějovice Junction modifications</td><td rowspan="2">Identified potential alternative project concept (cluster CZ079N either separate or as part of cluster CZ122N).</td></tr>
<tr><td>CZ122N</td><td>New line České Budějovice – Linz</td></tr>
</table>

Table 23.47 – Cluster alternatives

23.2 Road infrastructure

Selected measures in the road infrastructure are identified in alternative designs for future assessment. Identification of measure alternatives can proceed in the following cases:

1. low level of utilisation of planned measures, e.g. the planned expressways, in the outlook time horizons. The measures should be analysed in a lower design category as an alternative;
2. great financial demand and low economic efficiency of planned measures - e.g., replacement of investment-intensive expressways with modification to existing roads, including bypasses of municipalities along the route;
3. measures in conflict with positions of non-governmental, non-profit or environmental organisations and affected municipalities - assessment of alternatives to planned measures on major routes in line with the Contracting authority's request;
4. other alternative measures identified - theoretical measure alternatives identified in the process of work associated with resolution of deficiencies on first-class through roads.

Low level of utilisation of planned measures in the outlook time horizons

In order to identify measures that could be replaced with a different measure using a lower road category due to low level of utilisation, an analysis of the utilisation of the road capacity on the measures in preparation was performed using the traffic forecasting model (namely for 2050). The transport network analysed includes roads eliminating deficiencies identified (see previous chapters). This is essentially the complete proposed network of motorways and expressways as well as measures on first-class roads eliminating capacity deficiencies identified.

No.	Measure no.	Measure name	Road no.	Investor's proposed measure category
1	S130	R4, intersection with II/118 - Milín	R4	R25.5/100
2	S129	R4, Milín - Lety	R4	R25.5/100
3	S133	R4, Lety – Čimelice (implementation pending)	R4	R25.5/100
4	S132	R4, Čimelice - Mirotice	R4	R25.5/100
5	S137	R4, Mirotice, widening	R4	R25.5/100
6	S147-S148, S371, S146-S143	R6, intersection with I/27 (Petrohrad) - R6, Karlovy Vary	R6	R25.5/100
7	S185-S186	R11, 1108 -1109 Jaroměř – Polish border	R11	R25.5/120
8	S478	R35, Ohrazenice – Úlibice	R35	R25.5/120
9	S321-S322	R43, Svitávka – Staré Město	R43	R25.5/120
10	S155	R48, Frýdek Místek bypass (from intersection with I/56)	R48	R25.5/120
11	S217-S218	R49, 4903 Pozděchov – Slovak border	R49	R25.5/80
12	S002-S004	R52, 5204 Pohořelice – Ivaň; R52, 5205 Ivaň – Perná; R52, 5206 Perná – Austrian border	R52	R26.5/120
13	S444-S445	R56, Opava - Dolní Benešov; R 56, Dolní Benešov - Ostrava	R56	R25.5/120 (80)
14	S044	I/2, Pardubice southwestern bypass	I/2	S11.5/80
15	S037	I/13, Kladruby link	I/13	S24.5/100
16	S010	I/18, Příbram southeastern bypass	I/18	S11.5/70 S9.5/70
17	S501	I/26, intersection with D5 - Chotěšov, rerouting	I/26	S11.5/80
18	S407	I/34, Pelhřimov western bypass	I/34	S11.5/70
19	S484	I/36, Holice - Čestice	I/36	S9.5/80
20	S045	I/36, Pardubice Trnová - Fáblovka - Dubina	I/36	MS20/70, S11.5/70
21	S451	I/38, Znojmo - Hatě	I/38	S11.5/80 - 2+1
22	S469	I/61, Kladno bypass	I/61	S20.75/80; S9.5/80

Table 23.48 – Transport infrastructure measures in preparation with excess capacity in terms of transport quality levels

Great financial demand and low economic efficiency of planned measures

These alternatives was identified as part of subsequent works on Books 7 and 8.

Measures in conflict with positions of non-governmental, non-profit or environmental organisations and affected municipalities

Following an agreement with the Contracting authority and by request of representatives of non-governmental, non-profit or environmental organisations concerned at the Transport Sector Strategies, the TSS2 Consultant promised to perform an assessment of alternative to some of the measures in preparation as part of the MMA. Below there is a list of the affected measures identified by these organisations.

In connection with assessment of these alternatives, however, we must principally draw attention to one of the points of the Conclusion of the Enquiry Procedure on the SEA Process, which states that alternatives should be assessed "**where no corridor currently approved by a Government Resolution or spatially stabilised in Spatial Development Outlines in force exist for a proposed project, and where there is no route for which an approving EIA statement has been issued in the segment in question**". This conclusion will therefore also necessarily be taken into consideration in our assessment.

Road segment objected	Assessment method
R1 – segment of D1 – R7	Was assess alternative pursued by investor and a regional alternative
R43 – segment in South Moravian Region	Was assess alternative pursued by investor and alternative according to Kalčík, 2009
R52 – between Pohořelice and Austrian border	Was assess alternative pursued by investor and a zero alternative (keep I/52 in existing route)
R49 – between Lípa and Slovak border	Was assess alternative pursued by investor and a zero alternative (with only a bypass of Lhotsko)
R35 – between Turnov and Jičín	Was assess proposed north alternative and south alternative
R55 – between Staré Město and Rohatec	Was assess alternative pursued by investor and alternative P, sub-alternative CH according to Kalčík, 2007
Brno, southwest and south tangentials	Was assess alternative pursued by investor and a zero alternative (without southwest and south tangentials)

Table 23.49 – Assessment of alternative measures in road network

As it has already been mentioned herein above, the MMA methodology is not primarily intended for mutual assessment of measure alternatives that are to meet the same need and differ only in their routing in a similar territory. MMA was designed with the aim to mutually compare benefits of individual measures for settlement of indicated needs, and this objective has been met.

By applying the transport model, the project's consultant in cooperation with the contracting authority could assess only the measures that differ in terms of systems and where the measure alternatives do not differ only in the territorial routing within several kilometres. Among the alternatives assessed in this way was for example, on the basis of comments given in the SEA process, the alternative when new high-capacity links between the Hatě border crossing near Znojmo and the D1 motorway near Jihlava would be constructed in theory if the network extent was maintained in its current condition, + the Břeclav/Reintal border crossing would be concurrently without any limits set for freight transport and R55 would be constructed in the Otrokovice area (+ completed D1 around Přerov). This alternative was assessed with respect to the opinion given under the SEA proceedings that this solution could lead to reducing a considerable load on the Brno agglomeration (that is significantly loaded with emissions and noise even today). The achieved reductions of traffic in the Brno area were however relatively very low in this alternative.

Figure 23.14 – Modelled changes in freight traffic volumes in the case that homogenous I/38 (2+1), R55 and D1 exist

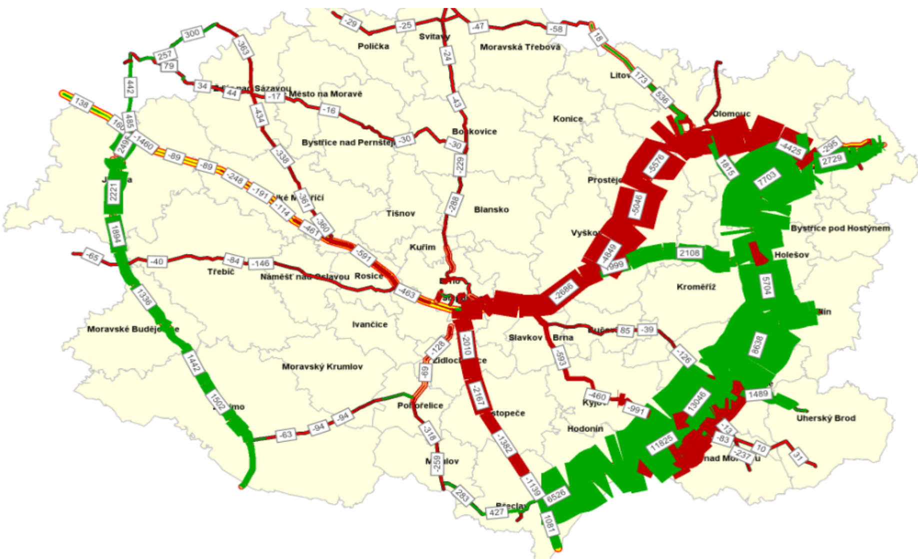


Figure 23.15 – Modelled changes in passenger traffic volumes in the case that homogenous I/38 (2+1), R55 and D1 exist

On the contrary, far more significant influence on reducing the load on this agglomeration had, in theory, immediate putting R35 expressway to operation in the Opatovice – Mohelnice segment, which resulted in transferring a much higher proportion of traffic to this north route.

They are graphic outcomes from the model obtained only by plotting / virtual putting the concerned roads to operation if no other development measure existed in CR. The stated results do not exclude the possibility of increasing accuracy in transport models that are focused more locally.

Other alternative measures identified

In the course of works related to the identification of deficiencies on first-class through roads (see 20.2.3 above), we identified a number of existing settlements where traffic should be diverted outside build-up areas. In some cases, this may be achieved by implementing one of the pursued projects of expressway, motorway or continuous first-class road construction; in other cases, a bypass can be built. Due to the above reasons (notably ad 1) and 2)), however, the construction of some of the expressway, motorway or compact first-class road construction projects may become problematic, which is why we have also identified theoretical alternative measures to resolve deficiencies on existing through roads (see Table 23.50).

Selection of the concrete alternative for above mentioned projects will be done in the follow-up process on the basis of the results of more detailed assessment which will be elaborated in the separated processes (ZÚR, feasibility study, EIA evaluation). Individual follow-up steps for each indicated design are described in detail in Chapter 10 of the Summary Document.

Alternative clusters		Clusters pursued by investor	
Cluster no.	Cluster name	Cluster no.	Cluster name
CS096P	I/43 Letovice - Lanškroun	CS199N	R43 Kuřim - Staré Město
CS118N	I/3 Kaplice, station - Netřebice	CS007P	R3 Třebonín – Austrian border
CS118-2N	I/3 Borek	CS007P	R3 Třebonín - Austrian border
CS119N	I/4 Skalka - Mirotice	CS015P	R4 Skalka – Mirotice
CS122N	I/6 Lubenec - Řevničov	CS016P	R6 Nové Strašecí - Hořovičky
CS143N	I/16 Zlatá Olešnice – Polish border	CS021P	R11 Jaroměř - Královec
CS149N	I/19 Tábor – Vysočina Region_Var	CS148N	I/19 Tábor - Vysočina Region
CS157N	I/20 Toužim – Tašovice	CS156N	I/20 Toužim – Žalmanov
CS174N	I/19 and I/29 Písek - Tábor _VAR	CS151N	I/19 and I/29 Písek - Tábor
CS180N	I/35 Turnov - Jičín	CS182N	R35 Úlibice - Ohrazenice (Turnov)
CS181N	I/35 Jičín - Hradec Králové	CS022P	R35 Jičín – Hradec Králové
CS183N	I/35 Hradec Králové - Litomyšl	CS023P	R35 Opatovice – Vysoké Mýto
CS187N	I/37 Trutnov - Dvůr Králové nad Labem	CS021P	R11 Jaroměř - Královec
CS187N	I/37 Trutnov - Dvůr Králové nad Labem	CS021P	R11 Jaroměř - Královec
CS197N	I/40 Valtice bypass	CS196N	I/40 Břeclav - Novosedly
CS201N	I/43 Svitavy - Lipůvka	CS199N	R43 Kuřim – Staré Město
CS209N	I/49 Vizovice – Valašská Polanka	CS030P	R49 Lípa - Horní Lideč
CS212N	I/50 Slavkov u Brna - Nesovice	CS211N	I/50 Slavkov u Brna – Slovak border
CS217N	I/55 Otrokovice – Veselí nad Moravou_VAR	CS033P	R55 Otrokovice – Uh. Hradiště
CS218N	I/55 Moravský Písek - Hodonín	CS034P	R55 Moravský Písek – Rohatec
CS231N	I/52 Mikulov bypass	CS031P	R52 Pohořelice - Mikulov
CS232N	I/35 Sadová bypass	CS022P	R35 Jičín – Hradec Králové
CS234N	Václavice - Benešov	CS005P	D3 in Central Bohemian Region

Table 23.50 – Additional alternative measures

23.3 Waterway infrastructure

In relation to the waterway infrastructure, the identification of measures failed to identify any direct alternatives to the individual measures at this strategic level. All of the measures are pursued in the beds of existing rivers.

Of course one can identify alternative solutions to navigability of some segments of the watercourses. Especially in the Lower Elbe area (between Střekov and the German border), we cannot foresee what position statement will be issued in connection with the assessment of the actual design for “Děčín Weir” as part of the EIA process currently in progress.

For the above reason, the Transport Sector Strategies, Phase 2, do not presume any specific form of measure in this area. A measure in the form that receives an affirmative EIA statement will be implemented; it has to be an economically efficient measure at the same time.

The alternative of not improving the parameters of major traffic waterways is not acceptable to the Ministry of Transport.

24 Identification of measures aimed at regional development

Connection of regions to transport infrastructure

In line with the assignment, we also analyse measures aimed at development of regions. The approach to this issue is based on the fact that the economic performance and development of regions are in direct proportion to the quality of their transport connections to other areas of the CR and abroad.

Current state of regional connection to transport infrastructure and identification of weak areas

Region	Railway infrastructure	Road infrastructure	Aviation infrastructure	Weak areas	Share of population [1)]
Central Bohemian	Yes	Yes	Yes	No	-
Prague	Yes	Yes	Yes	No	-
Plzeň	Yes	Yes	Yes	Yes	3.0%
South Bohemian	Partly	No	No	No	-
Karlovy Vary	Partly	No	Yes	Yes	41.2%
Ústí nad Labem	Yes	Partly	No	Yes	87.9%
Liberec	No	Yes	No	Yes	16.9%
Hradec Králové	Partly	Yes	Yes	Yes	3.1%
Pardubice	Yes	Yes	Yes	Yes	16.9%
Vysočina	Partly	Yes	Yes	Yes	23.9%
South Moravian	Yes	Yes	Yes	No	-
Olomouc	Yes	Yes	Yes	Yes	51.1%
Zlín	Partly	Yes	Yes	Yes	15.6%
Moravian-Silesian	Yes	Yes	Yes	Yes	64.1%

1) Proportion of population of weak area to total regional population calculated using the method described below in this chapter

Table 24.51 – Accessibility of regions in terms of connections to transport infrastructure

Region	Railway infrastructure	Road infrastructure	Aviation infrastructure	Water infrastructure
Central Bohemian				
Prague				
Plzeň				
South Bohemian	CZ005P	CS005P, CS006P	South Bohemian Airport at České Budějovice, CS005P, CS006P	
Karlovy Vary	CZ030N, CZ040N	CS016P, CS017P		
Ústí nad Labem		D8, 0805 Bílinka - Řehlovice	CS012P, D8, 0805 Bílinka - Řehlovice	
Liberec	CZ035N, CZ123N		CS012P	
Hradec Králové	CZ010P, CZ019P, CZ039N, CZ055N			
Pardubice				
Vysočina	CZ032N			
South Moravian				
Olomouc				
Zlín	CZ009P, CZ011P, CZ087P			
Moravian-Silesian				

Table 24.52 – Accessibility of regions in terms of connections to transport infrastructure; measures providing improved accessibility

25 Identification of measures for regional transport

Railway transport, if of an adequate quality in a region, is perceived as the backbone of regional transport systems. This results in transfer points – public transport terminals, which enable transfers typically between railway and bus (or other urban) transport as well as between public and private car transport (chiefly P+R type parking).

Based on meetings with representatives of regional authorities (including Prague Municipal Authority), we identified unsatisfactory places in terms of optimum fulfilment of transfer functions.

Region	Location / deficiencies
Hl.m. Prague	Non-existence of train halts Podbaba, Rajská Zahrada, Kačerov, Malešice (Depo Hostivař metro), Zahradní Město, Eden, Výtoň, connection between Masarykovo and Main Stations, outlook connection of Prague-Vršovice Station with Nám. bří Synků station on metro line D (Otakarova), connection of railway and air transport at Vaclav Havel Airport Prague
Central Bohemian	Train stations at ends of Prague suburban railway line arms, Mladá Boleslav
South Bohemian	Required modification of infrastructure connected chiefly to relocation of bus stops: Zliv, Číčenice (190), Černá v Pošumaví (194), Kaplice nádraží (196), Volary (197), Borovany (199), Milevsko (201), Ševětín (220), Třeboň (226), Slavonice (227); transfers at České Budějovice terminal, development of Jindřichův Hradec terminal
Plzeň	Transfer nodes at Plzeň (new bus terminal), Klatovy, Kařez, Bezdružice, Žihle, Plasy, Nezvěstice, Stod, Domažlice
Karlovy Vary	Karlovy Vary lower stations, Aš, Chodov
Ústí nad Labem	Benešov nad Ploučnicí, Česká Kamenice, Ústí nad Labem, Chomutov, Klášterec nad Ohří, Štětí, Roudnice nad Labem, Podbořany
Liberec	Liberec, Jablonec nad Nisou, Česká Lípa, Semily, Železný Brod, Nový Bor
Hradec Králové	Makeshift conditions at transfer nodes Dvůr Králové nad Labem, Opočno, Hostinné, nonexistent terminal in Nový Bydžov
Pardubice	Non-competitive running time Chrudim-Pardubice, electrification impossible because there is an airport nearby
Vysočina	Missing terminals Jihlava město, Třebíč; development of terminals in Žďár nad Sázavou, Nové Město na Moravě, Světlá nad Sázavou; missing wheelchair access to platforms of Havlíčkův Brod Station
South Moravian	Unsatisfactory condition of transfer nodes Břeclav, Letovice, Skalice nad Svit., Podivín, Vranovice, Vyškov; missing transfer nodes Brno-St.Lískovec, Brno-Černovice; lack of P&R in virtually all the nodes
Olomouc	Olomouc – great distance between bus and train stations (public transport link good)
Zlín	Zlín střed
Moravian-Silesian	Public transport transfer terminal Ostrava-Svinov under construction (already completed)

Table 25.53 – Most important unsatisfactory places in terms of transfers between railways and other transport

26 Identification of measures for development of public logistics

Due to the unsatisfactory state of freight transport and its distribution among the modes and the overloading of the road and motorway network with freight traffic, a method to achieve a shift of part of the traffic performance to more environmentally friendly modes of transport is sought. The Government of the CR adopted a resolution on the Strategy of Support to Logistics from Public Funds at its session on 21 December 2009.

One of the objectives of this strategy is the construction of a network of public logistic centres (PLC) in specified areas. In a given area, a PLC aims at satisfying the demand for long-distance transport of freight within a certain attraction radius, chiefly for small and medium businesses.

The operation of freight traffic based on the commodality principle is one of the principal objectives of both the European and Czech transport policies. The Czech Republic's Strategy of Support to Logistics from Public Funds follows up on European objectives. A network of PLC based on the regional principle is implemented in Western European countries all the way to Hungary. Such a network is lacking in the Czech Republic. The Strategy of Support to Logistics from Public Funds therefore aims, among other things, at defining the rules for creating such a PLC network in the CR and connecting it to the European network. Public logistics based on the regional principle will have an impact on regional development and help resolve fundamental problems in transport.

Among other things, the initial paper defines the term PLC – Public Logistics Centre – in the national context. A PLC is a specific transport and business area in which all the activities concerning freight transport, logistics and distribution are concentrated, for both national and international transport, which may be performed by different entities. These entities may be either owners or tenants of the erected constructions and facilities (warehouses, shipment consolidation centres, storage yards, offices, parking areas, etc.).

To bring the PLC activity into compliance with the rules of free economic competition, a PLC has to permit non-discriminatory access of all companies involved in the above activities.

In order to support combined transport for freight handling, the **PLC must have as many different transport modes available**, never less than two; road, railway, inland water and air transport come into play in the Czech Republic. It is also essential that a PLC be managed by a single entity, either public or private.

The national Strategy of Support to Logistics from Public Funds divides public logistics centres into **Logistic Centres of the 1st Sequence and Logistic Centres of the 2nd Sequence**. The first category includes PLC of national importance, of which there should be two: one for Bohemia and one for Moravia.

The public logistics centres of **national importance** will perform the following functions:

- two nodes within the Europe-wide system of multimodal transport, as well as direct road, rail, possibly water and air transport. They will each perform the functions of a hub, one for Bohemia and one for Moravia. They will include a heavy-duty transhipment facility for combined transport (CT);
- the other functions as regional PLC; they will each have an attraction radius defined for their respective areas (see regional centres).

26.1 Priorities in development of public logistics

Given the very early state of project preparedness, it is not possible to specify concrete investment priorities unequivocally at this point.

The areas defined in the CR are as follows: Central Bohemia, Brno area, Ostrava area, Plzeň area, Pardubice – Hradec Králové area, České Budějovice area, Ústí nad Labem – Lovosice area, Olomouc – Přerov area, Jihlava – Havlíčkův Brod area, Liberec area, Karlovy Vary – Sokolov – Cheb area. The Olomouc – Přerov and Central Bohemia areas have been defined as PLC of national importance.

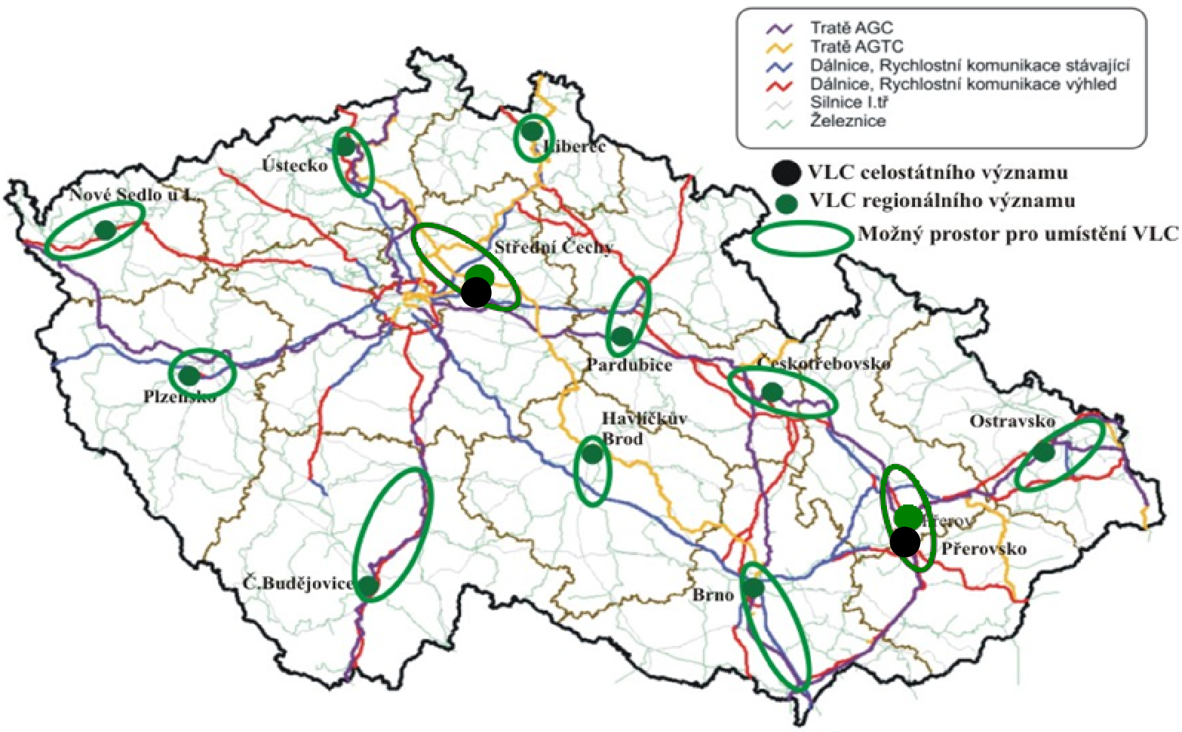


Figure 26.16 – Plan for developing PLC network as per Strategy of Support to Logistics from Public Funds (source: MoT)

In the support efforts, it is still necessary to exactly define requirements that a container terminal or a logistics centre has to meet to be allowed to enjoy the status of a "public logistics centre" (PLC). They encompass at least the following aspects:

- public access for both forwarders and end customers;
- guaranteed prices and conditions of logistics services known in advance;
- utilisation of at least two transport modes in the logistics process;
- provision of selected associated services during freight transhipment and handling.

26.2 Identification of concrete measures

Our work included an analysis of the territorial distribution of PLC (combined transport terminals). The tables below show its results, including the identification of concrete measures.

Region	Regional authority view / SDO	National strategy
Prague	Freight transport concept not finalised, but emphasise put on city logistics. Malešice and Smíchov locations, or alternatively Libeň and Krč, are considered for the terminal.	Within radius of PLC of national importance assumed in Central Bohemia (Kolín – Mělník).
Central Bohemian	Issue not handled explicitly.	PLC of national importance assumed in Central Bohemia (Kolín – Mělník).
Plzeň	Issue not handled explicitly.	PLC of regional importance assumed in Plzeň area (Nýřany – Rokycany).
South Bohemian	Nemanice PLC contained in SDO and promoted by regional authority.	PLC of regional importance assumed in České Budějovice area (České Budějovice – Tábor).
Karlovy Vary	Issue not handled explicitly.	PLC of regional importance assumed in Nové Sedlo u Lokte (Cheb – Karlovy Vary).
Ústí nad Labem	Issue not handled explicitly. Development expected at existing terminal in Lovosice.	PLC of regional importance assumed in Ústí nad Labem area (Ústí n.L. - Lovosice).
Liberec	Issue not handled explicitly.	PLC of regional importance assumed in Turnov area.
Hradec Králové	Issue not handled explicitly.	Within radius of PLC of regional importance assumed in Pardubice area (Pardubice – Hradec Králové).
Pardubice	Pardubice port incl. industrial railway link contained in SDO.	PLC of regional importance assumed in Pardubice area (Pardubice – Hradec Králové). In addition, a combined transport area has recently opened in Česká Třebová (Česká Třebová area).
Vysočina	Issue not handled explicitly.	PLC of regional importance assumed in Havlíčkův Brod area (Havlíčkův Brod – Jihlava).
South Moravian	Břeclav PLC contained in SDO.	PLC of regional importance assumed in Brno area (Brno – Břeclav).
Olomouc	Přerov terminal contained in SDO.	PLC of national importance assumed in Přerov area (Olomouc – Otrokovice).
Zlín	Places for transhipment facilities and logistics centres identified in SDO: Hulín, Otrokovice, Valašské Meziříčí, Staré Město u U.H.	Within radius of PLC of national importance assumed in Přerov area (Olomouc – Otrokovice).
Moravian-Silesian	Bohumín-Vrbice terminal contained in SDO.	PLC of regional importance assumed in Ostrava area (Mošnov – Bohumín).

Table 26.54 – Public logistics strategy

Measure	Name	Region	Type
J045	Central Bohemian PLC	CB	Public logistics centre, national

J046	Central Moravian PLC (Olomouc/Přerov area)	OL	Public logistics centre, national
J047	Brno area PLC	SM	Public logistics centre, regional
J048	Ostrava area PLC	MS	Public logistics centre, regional
J049	Plzeň area PLC	PL	Public logistics centre, regional
J050	Pardubice / Hradec Králové area PLC	PC	Public logistics centre, regional
J051	České Budějovice area PLC	SB	Public logistics centre, regional
J052	Ústí nad Labem Region PLC (Ústí nad Labem / Lovosice)	UL	Public logistics centre, regional
J053	Vysočina PLC	VY	Public logistics centre, regional
J054	Liberec area PLC	LB	Public logistics centre, regional
J055	Karlovy Vary area PLC	KV	Public logistics centre, regional

Table 26.55– Identification of measures in public logistics

27 Development in ITS

27.1 Priorities and needs in the field of ITS development in road transport

The priorities in ITS development in road transport are given by the combination of the European legislative requirements and the Czech Republic's own needs. These two aspects inform the below frameworks of key measures that have to be elaborated in detain in the aforesaid ***"Action plan for implementing intelligent transport systems in the CR"*** and then implemented. In this sense, they will mainly involve the introduction of the European Electronic Toll service (EETS), provisions for securing performance of the toll system after contracts with the current general supplier have been terminated from 1 January 2017 and implementation of so-called priority activities defined by Directive 40/2010/EU. Package B1 is therefore subdivided into the following measures:

- B1.1 – Data collection
- B1.2 – Provision of transport information and transport management
- B1.3 – Electronic Toll system
- B1.4 – eCall interoperability service

27.2 Priorities and needs in ITS development in railway transport

International cooperation in railway traffic safety across the European Union is required ever more often due to the integration of European railways. One of the main tasks to implement is therefore securing interoperability on the high-speed and conventional trans-European railway network.

The European Commission defined an overall strategy for developing the **ERTMS** (European Rail Traffic Management System) in 1995. The objective was to prepare it future implementation in the European railway network, and it was reflected in the interoperability directives and then the Technical Specifications for Interoperability of the Traffic Management and Safety Subsystems for both high-speed and conventional European railway systems.

The objective is to achieve interoperability on all the lines included in the European railway system. The technical essence of interoperability is primarily the deployment of European traffic management and safety equipment systems, that is the ETCS (European Train Control System) level 2 and digital mobile radio networks providing voice and data services under **GSM-R** (Global System for Mobile Communication - Railways).

27.3 Priorities and needs in ITS development in inland water transport

As part of development of ITS in water transport, we need to continue creating a continuous RIS information system, updating and expanding it.

The concrete measures for development of ITS systems in water transport of national importance are as follows:

- **Expansion of RIS under IRIS Europe III**
- **Implementation of a single payment system for port**
- **Adjustments to navigation signage on power lines**
- **Expansion of infrastructure for radiotelephony**

27.4 Priorities and financial requirements in ITS development in air transport

The European Commission has initiated the Single European Sky Policy project, accurately reproducing the current needs in air transport.

The concrete measure defined for the area of developing ITS systems for air transport of national importance is:

- Acquisition of a new system for provision of air navigation services ("Replacement of the Main System").

27.5 Introduction of intelligent transport systems in cities

Some of the big cities in the CR already have strategic papers for ITS development, but not all have been approved by the municipal authorities (Prague, Brno, Ústí nad Labem, Pardubice, Ostrava, Liberec a Zlín).

Cities are mostly concerned with installation and operation of traffic lights and parking, development of public transport, some also with cycling.

28 Measures aimed at improving safety and environmental quality

28.1 Safety

28.1.1 Railway infrastructure

Concerning safety in the railway network, the emergency situations (ES) can be divided into two basic groups:

- emergency situations as part of railway operation; and
- collisions with persons and road vehicles.

The first category of emergency situations (approx. 68%) occurs mainly due to rail vehicle traffic and can be regarded as internal events. These emergency situations make up a large proportion of the total but their impacts on human health and lives are minimal (approx. 1.6%).

The second category of emergency situations involves collisions of railway vehicles (RV) with road vehicles and individuals. These emergency situations make up "only" approx. 32% of the total number, but they have a massive share in the health and life impacts (approx. 98% of deaths and 74% of injuries).

Based on the statistics of causes of emergencies, we included criteria in the multi-criteria assessment for both installation of new safety devices (increasing safety by eliminating the human factor on traffic control) and also adjustment to or reductions in unused level crossings and establishment of grade-separated crossings.

28.1.2 Road infrastructure

Reducing the numbers and consequences of traffic accidents should be one of the priorities when creating, developing and advancing transport infrastructure, because the investment in safe transport infrastructure is return manifold in the form of lives not destroyed, fewer traffic accidents and further elimination of adverse effects of traffic accidents.

As concerns increasing transport safety, there are 3 primary areas to focus on and act in order to reduce the numbers and consequences of traffic accidents:

A) Transport infrastructure

B) Driver Behaviour

C) Vehicles

The road traffic safety issues are handled in a separate strategic document as a follow-up on the Transport Policy of the CR. This is the National Road Traffic Safety Strategy for 2011 – 2020. See www.ibesip.cz/cz/strategie for more details.

28.2 The environment

Environmental protection makes a significant contribution to improving the quality of our lives. For this reason, we have to plan, upgrade and add measures aimed at improving environmental quality and public health when planning and building transport infrastructure.

The entity (project investor) applying for a building permit or a final approval as part of the preparatory process for new infrastructural projects has to ensure that the planned project is satisfactory in terms of environmental protection and minimises its impacts on the environment, infrastructure users and other persons. For this reason, a primary attention was paid only to measures on the existing transport infrastructure - elimination of influences of implementation of concrete investment measures. With most existing constructions, the most serious lack being mainly an impact of noise and emission burden on participants of the traffic and on inhabitants in the surrounding of these constructions. Therefore, it is desirable to implement primarily such sections of the network which deal with the bypass of densely built up areas and reduce the load of through roads considerably burdened with traffic today. Implementation of specific measures leads to improving the conditions in the vicinity of the current projects, reducing traffic load on them. Many plans with such benefits have been recommended to be implemented as a matter of priority on the basis of assessment of their necessity.

29 Sorting out of identified measures

29.1 Explanation of basic terms

Within the framework of solution of the project Transport Sector Strategies, 2nd Phase there is proposed the following hierarchical structure arising from the basic division of identified measures:

- General group of packages
- Categories of packages of measures
- Packages of concrete measures

Explanation of terms used follows (for the purpose of recapitulation, we state some of the terms that were defined earlier):

Measure – proposed activity for maintenance and development of transport infrastructure (includes construction projects and suggestions, but also other activities related to maintenance and quality improvement of transport infrastructure). It is the lowest level from which are created functional clusters of projects or suggestions. It divides into projects and suggestions.

Project – proposed concrete building measure on transport infrastructure, individual building project as registered by investors subordinate to MoT CR. There is more detailed information available for projects for instance from documentation already elaborated.

Suggestion – infrastructural measure not specified in detail (for example in the field of technical parameters, investment costs, etc.) which may usually be expected to be implemented no sooner than in a long-term horizon. Project preparation is planned for proposed projects in the mid-term horizon.

Cluster (set of measures) – functionally connected group of individual projects or suggestions which mutually relate to one another. Clusters will be the subject-matter of transport modelling and multi-level multi-criteria evaluation (MMA). Clusters are created separately for projects and suggestions respectively due to the differing evaluation of these types of measures in the multi-criteria analysis.

General group of packages (Group of packages) – Basic division of measures according to their relation to the planned or existing transport infrastructure and according to its ownership (A, B, C ... E). Three groups (A, B, C) contain projects within the competence of the state and two groups (D, E) contain regional or municipal projects with the participation of the state or European funding.

Category of packages (Category) – set of groups of measures similar in terms of type (A1, A2... , B1, B2, ..., etc.) within the framework of general groups of packages.

Package of measures (Package)– group of measures of the same type on the given type of transport infrastructure (A1.1, A1.2.... etc.) Level of the detailed nature of packages corresponds with a strategic level of the national plan of infrastructure development.

The scheme of the hierarchical structure of the above specified terms is shown in the figure.

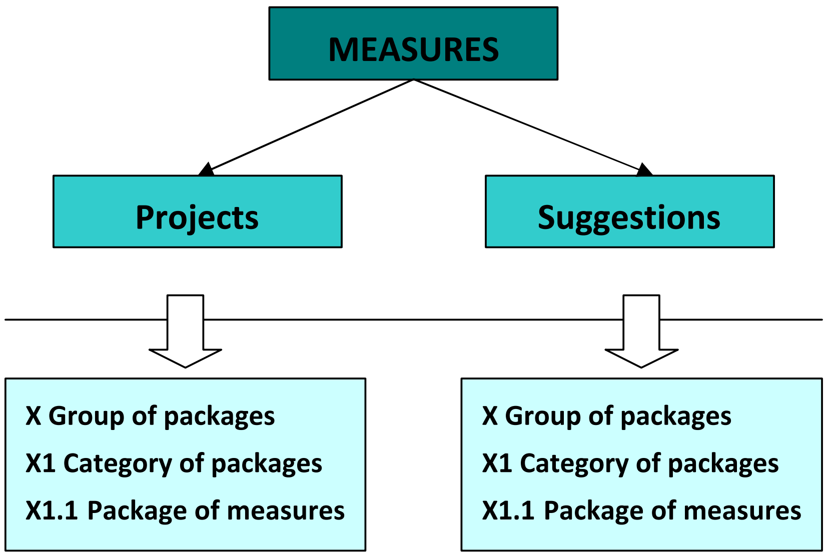


Figure 29.17 – The scheme of the hierarchical structure of the basic terms

29.2 Main categorization of measures

Basic division, categorization of individual projects and suggestions is divided into the following five thematic levels because at the level of creation of the plan of implementation of infrastructural measures it is necessary to create a space for development of projects within the scope of overall financial needs for development and administration of transport infrastructure. Development of transport infrastructure is also related to quality improvement of services rendered or increase of safety. It must not be preferred at the expense of further increasing the deficit in the maintenance of existing infrastructure.

General groups of packages of projects are:

A. Main priorities of construction and modernization of transport networks of a state and international importance (e.g. new roads, motorways, modernization of transit railway corridors, new lines, important waterways, terminals, etc.).

B. Supporting packages for development of transport infrastructure of at least state importance (e.g. removal of accident localities, various types of ITS, securing interoperability of railway transport, etc.).

C. **Basic acts within the framework of administration of infrastructure (e.g. maintenance, reconstruction).**

D. Financial support of development of important infrastructure on the regional or municipal level (e.g. subsidy programmes)

E. Regional projects expected for funding from planned operational programmes 2014 - 2020.

29.3 Groups, categories, and packages of projects

A	Main priorities of construction and modernization of transport networks
A 1	Development of motorways, expressways, and Ist class roads
A 1.1	Construction of new sections of motorways
A 1.2	Construction of new sections of expressways
A 1.3	Modernization of Ist class roads
A 1.4	Expansion of capacity and modernization of motorways and expressways
A 1.5	Construction of bypasses and relocated tracks of I. class roads
A 2	Development of railway infrastructure
A 2.1	Construction of new sections of conventional railway network
A 2.2	Modernization/optimization/electrification of the existing lines
A 2.3	Modernization of railway centres and stations
A 2.4	Revitalization of regional routes
A 2.5	Removal of bottleneck and local drawbacks
A 2.6	Construction of sections of high-speed tracks and fast connections
A 3	Development of water infrastructure
A 3.1	Projects of making the Elbe water way navigable
A 3.2	Expansion of capacity and modernization of waterways
A 3.3.	Construction of canals

A 3.4	Port and service infrastructure
A 3.5	Development of waterways for recreational navigation
A 4	Development of infrastructure of air transport
A 4.1	Construction of landing runway at the Vaclav Havel Airport Prague
A 4.2	Expansion of capacity and modernization of other airports
A 5	Development of transport terminals
A 5.1	Development of new VLC and public terminals of combined transport
A 5.2	Construction of new changing terminals HD

Table 29.56 – Groups, categories and packages of projects (group A)

B	Supporting activities for development of transport infrastructure
B 1	Introduction and development of ITS for road transport on motorways, expressways and I. class roads
B 1.1	Data collection
B 1.2	Traffic-information services and traffic management
B 1.3	Electronic toll system
B 1.4	eCall service
B 2	Safety and the environment
B 2.1.	Use of road traffic control systems for traffic safety
B 2.2.	Equipment for monitoring observance of emission limits and support to development of the network of feeder stations for alternative energies
B 2.3	Adjustments of accident localities
B 3	Equipment for traffic control on the railway infrastructure
B 3.1	Modernization of signalling and communication devices as a condition of securing interoperability of national wide routes (including ETCS / GSM-R)
B 3.2	Modernization of signalling and communication devices on side state-wide and regional routes (rationalization)
B 3.3.	Removal or securing grade crossing
B 4	Traffic control of water infrastructure
B 4.1	Water transport management projects
B 4.2	Equipment for increasing reliability of waterways
B 5	Air traffic control
B 5.1	Air transport management projects
B 6	Equipment of transport terminals
B 6.1	Equipment of terminals of freight transport
B 6.2	Equipment of terminals of passenger transport - airports, ports

Table 29.57 – Groups, categories, and packages of projects (Group B)

C	Basic acts within the scope of administration of infrastructure
C1	Securing of system funding of maintenance, repairs, reconstruction of the railway transport infrastructure
C 1.1	Maintenance and repairs of railway lines, stations and their parts
C 1.2	Reconstruction of railway lines, stations and their parts
C2	Securing of system funding of maintenance, repairs, reconstruction of the state road infrastructure
C2.1	Maintenance and repairs of motorways, expressways, Ist class roads
C2.2	Reconstruction of motorways, expressways, Ist class roads, measures of a small extent dealing with individual drawbacks and defects
C3	Securing of system financing of maintenance, repairs, and renewal of waterways
C3.1	Maintenance and repairs of waterways
C3.2	Reconstruction of waterways
C4	Limitation of the impact on the environment and public health
C4.1	Measure for protection against noise on the existing transport infrastructure within the competence of the state
C4.2	Measures to compensate the impact on animals of new infrastructure
C4.3	Other investment in reduction of negative influences of the operation of the railway on the environment

Table 29.58 – Groups, categories, and packages of projects (Group C)

D	Financial support of development of strategic key infrastructure on the regional or municipal level
D 1	Support of development of infrastructure of public transport
D 2	Modernization of technical infrastructure of important public regional airports with international operation
D 3	Building of cycling infrastructure
D 4	Introduction of intelligent transport systems in towns
D 5	Improvement of safety of road infrastructure in towns
D 6	Making public transport accessible to persons with a limited ability of movement or sense of direction
D 7	Limitation of the impact on the environment and public health
D 8	Maintenance, repairs, and renewal of the IInd and IIIrd class roads
D 9	Support of development of ports and logistical centres in private ownership

Table 29.59 – Groups, categories, and packages of projects (Group D)

E	Regional projects expected for funding from Operational programmes in the period of 2014 - 2020
E 1	Construction and renewal of the IInd class roads
E 2	Construction and renewal of the IIIrd class roads
E 3	Terminals of regional and public transport
E 4	Traffic control and information systems on the IInd and IIIrd class roads
E 5	Improvement of safety on the IInd and IIIrd class roads

Table 29.60 – Groups, categories, and packages of projects (Group E)

29.4 Arrangement of projects into packages

Individual measures of transport infrastructure of A group (divided into projects and suggestions) are put - for purposes of transport modelling and MMA - into Clusters of projects (sets of constructions, routes). These communication routes define individual projects or suggestions which are the subject-matter of assessment of the economic efficiency and related multi-criteria analysis (MMA).

30 Rationalization of an existing transport infrastructure

Generally speaking, the term 'rationalization' can be understood as increasing the economic efficiency of a certain object or activity; here, it is transport infrastructure. This chapter focuses both on the object – transport infrastructure itself, and — partially — the activity associated with it, being the transport infrastructure operation. This chapter deals exclusively with the existing infrastructure. Suggested reductions in the studied measures that are to contribute to meeting the users' needs were the subject matter of the work done with respect to Book 7 and are summarized in the recommendations in Book 7.

We can conclude that all the transport modes assessed show fundamental differences from this point of view, whether in the form of actual functioning, administrative and proprietary relations or other aspects. That is why the term 'rationalization' is not applied to all the transport modes according to a single methodology.

30.1 Railway infrastructure rationalization

Railway infrastructure falls within the powers of the State in almost its full extent, which is why it is in order to deal with rationalizing it. Since the Transport Sector Strategies, Phase 2, primarily focuses on infrastructure, we can define two basic discussion topics:

- infrastructure rationalization (optimization of infrastructure extent), and
- operation rationalization (traffic management; operating railway transport).

From the point of view of railway infrastructure rationalization, the principal question is the utilization of the primary infrastructural elements – railway lines.

From the infrastructural perspective, railway operation rationalization can be specified more closely as an issue of traffic management and operating railway transport. In this sense, the concept is well-established on the Czech railways.

30.2 Road infrastructure rationalization

With road infrastructure unlike the railway infrastructure, there is not expected any cancellation of existing sections of roads in the administration of the state. Rationalization in this sense of the word is not - in relation to this infrastructure - a relevant problem. Lower-class communications over land - with which there cannot be entirely excluded a necessity of reduction in the long-term horizon - are not in the administration of the state.

From a temporal perspective, the issue can be divided into two levels:

- Resolving the problem of transferring 1st class road sections where a parallel expressway or motorway has already been put into operation or a new road is under construction.

- Future resolution of the issue of transfers of 1st class road sections where a parallel motorway or expressway is currently in the planning process.

30.3 Waterway infrastructure rationalization

The network of waterways in the Czech Republic is incomplete (not connected into integrated routes) and, moreover, the waterways are parts of watercourses with few exceptions, which is why no optimization of the waterway network by reducing some of the existing sections can be conceived.

Rationalization of the waterway system can be chiefly considered as operational and water traffic management optimization.

31 Railway traffic management rationalization

In the Czech railway environment, the term "rationalization of traffic management" connotes investment in infrastructure that aims at implementing necessary technical measures on railway infrastructure that result in a reduction in staff involved in traffic management, thus saving money expended on ensuring operability of the transport infrastructure.

Additional important technical parameters and measures of rationalization projects follow.

- Safety devices,
- Communication devices,
- Railway superstructure and other adjustments.

31.1 Identification of railway lines where traffic management rationalization is recommended

Besides improving safety (elimination of human error in traffic management), the decisive requirements is saving of traffic management costs. We have compiled a method for identification of railway lines based on the following criteria:

- Traffic management method, and
- Traffic management costs.

Line no.	Line	Traffic control method	Line category (proposed)	Already handled under different measure	Newly included in list of measures
020	Choceň – Velký Osek	D2	N	X	
021	Letohrad – Týniště n/Orlicí	D2	N		X
024	Ústí nad Orlicí – Štíty (Lichkov – Dolní Lipka)	D2	R		
026	Týniště n/Orlicí – Otovice zastávka	D2	N/R		X
030	Jaroměř – Liberec	DOZ/D2	N	(X)	(X)
031	Pardubice os.n. – Jaroměř	D2	N	X	
032	Jaroměř – Trutnov hl.n.	D2	N	X	
033	Václavice – Starkoč	D2	N	X	
036	Liberec – Tanvald – Harrachov	D2/D3D	R	X	
037	Liberec – Černousy st.hr.	D2	N	X	
040	Chlumec nad Cidlinou – Trutnov hl.n.	D2	R		X
044	Kunčice n/Labem – Vrchlabí	D2	R		X
060	Nymburk hl.n. – Poříčany	D2	N		X
061	Jičín – Nymburk město	D2	R	X	
070	Praha-Vysočany – Turnov	D2	N	X	
071	Nymburk hl.n. – Mladá Boleslav hl.n.	D2	N	X	
081	Děčín východ-horní nádraží – Rumburk	D2	N/R	X	
083	Rumburk – Dolní Poustevna st.hr.	D2/D3D	R	X	
086	Liberec – Česká Lípa hl.n.	D2	N	X	
089	Rybniště – Varnsdorf st.hr.; Hrádek n.N. st.hr. – Liberec	D2	N/R	X	
092	Kralupy nad Vltavou – Neratovice	D2	N	X	
093	Kladno – Kralupy nad Vltavou	D2	N	X	
110	Kralupy nad Vltavou – Louny	DOZ/D2	R		(X)
120	Praha-Bubny – Rakovník	D2	N	X	
122	Praha-Smíchov – Rudná u Prahy	D2	N/R	(X)	
124	Lužná u Rakovníka – Chomutov os.n.	D2	N/R	(X)	X
126	Most – Rakovník	D2	R	(X)	X
134	Litvínov – Oldřichov u Duchcova	D2/1D	R	(X)	
173	Praha-Smíchov – Beroun-Závodí	D2	R	(X)	
174	Rakovník – Beroun os.n.	D2	R		X
185	Horažďovice předměstí – Domažlice	D2	R	X	
225	Havlíčkův Brod – Veselí nad Lužnicí	DOZ/D2	N	X	
238	Havlíčkův Brod – Pardubice-Rosice n.L.	DOZ/D2	N/R	X	
290	Olomouc hl.n. – Šumperk	D2	R	X	
301	Olomouc hl.n. – Nezamyslice	D2	N	X	
303	Valašské Meziříčí – Kojetín	D2	N/R	X	
310	Olomouc hl.n. – Opava východ	D2	N	(X)	X
323	Ostrava hl.n.-osobní nádr. – Valašské Meziříčí	D2	N/R	X	

Control method:	1D – line bounded by a single operating point DOZ – remote control of interlocking devices D3 – lines operated under D3 regulation, timetable-based traffic control D3D – lines operated under D3 regulation, traffic control through train dispatcher D2 – other lines, default traffic control under D2 regulation
Line category (proposed):	N – nation-wide lines, R – regional lines (proposed as per MoT paper “Criteria for Railway Network Categorization”)

Table 31.61 – Selected lines recommended for priority verification of rationalization measures

31.2 Railway Lines Revitalization

Based on experience with rationalization measures already implemented, it is recommendable to extend the scope of activities with additional infrastructural adjustments (primarily track modifications and building of platform 550 mm above the top of rail, shifting or setting up new halts when requirements of ordering parties are justified) and label these projects as **revitalizations**. These adjustments can be made as part of a single project or as an accompanying project before or during the traffic management rationalization itself.

That is the only way to concurrently achieve increased passenger comfort and improve conditions for the utilization of railway lines.

Book 7 – Financial Demands of the Identified Measures

32 Financial requirements – operation of transport networks

Concerning the financial requirements of operating transport networks, we need to approach each of the transport modes assessed absolutely individually. This arises from the technological differences among the modes. The financial requirements of operating transport networks definitely play the most important role in railway transport.

32.1 Railway infrastructure

Initial condition

The nominal cost of traffic control in the railway network is determined chiefly by the number of transport employees involved in traffic control (signalmen, train dispatchers, operators, supervisors, administration staff) and the length of the railway lines controlled.

As part of our work on Book 7, an analysis of costs of railway operation concerning the RIA railway lines was performed (based on RIA information).

Financial requirement forecast for future

The financial requirement forecast for railway network traffic control is based on retaining the existing nominal rates. The parameters that change are as follows:

- length of railway network (for lines as per characteristics defined), and
- change in technical traffic control methods.

The table below shows a summary of the forecast financial requirement of traffic control in the railway network in crucial time points.

	2012	2015	2020	2035	2050
Length of assessed network [km]	9260	9255	9230	9410	9618
Total costs of traffic control [CZK bln/year]	5.408	5.380	5.243	5.092	4.965

Note: The forecast includes a reasonable development of the new line (Rapid Link) network.

Table 32.62 – Forecast of traffic operation costs in railway network (constant prices of 2012)

The total costs of railway traffic operation in constant prices are expected to decrease along with gradually extending deployment of facility remote control systems because the number of employees required to operate the line is reduced as a result of installation of such a system — significant reduction of wage and salary costs.

32.2 Road infrastructure

Unlike railway infrastructure, the road infrastructure is mostly utilised by private traffic. It follows from its nature that, except for a few telematics systems on motorways, expressways or in tunnels, or municipal telematics systems, this type of traffic is uncontrolled.

32.3 Waterway infrastructure

Management of traffic on the waterways being dealt with (the Elbe, the Vltava, the Berounka, the Baťa canal /Channel/ is currently secured by Státní plavební správa /State Navigation Administration/. Lockage through lock chambers is secured at the costs of state enterprises of Povodí.

Traffic control on waterways is not funded from the sources handled under TSS2.

32.4 Aviation infrastructure

Compared to some other transport modes assessed, aviation is characterised by several specific features as concerns traffic operation. Air traffic in the Czech Republic is controlled by Air Navigation Service. This state enterprise is not funded from the state budget (SFTI) but covers its operation from charges levied on air transport operators who make use of its services.

For the above reason, the inclusion of the costs of air traffic control in the total costs of transport network operation is irrelevant.

32.5 Other transport infrastructure components

No financial requirements were identified in the other transport infrastructure components that would require coverage from the funds dealt with in this paper. If any such cases should occur notwithstanding, their effect on the overall amount of funds will likely be negligible.

33 Financial requirements – operability of transport networks

Operability of transport networks can be defined as maintaining transport infrastructure in a condition that will provide safe and reliable functioning of these systems. The rate of financial requirement for each transport mode is vastly different and is based on the transport technology, scope of the network and other attributes. This chapter analyses the approaches applied to maintain the operability of transport systems; it also defines optimum approaches resulting in the most efficient maintenance and repairs of these systems, and each subchapter also quantifies the costs expressing the financial requirements of each transport system for maintaining it operable.

33.1 Railway infrastructure

Initial condition

As part of our work on Book 7, we analysed the costs of providing operability on railway lines managed by the RIA.

The lines were divided into 13 groups by their characteristic attributes.

The determination of the nominal rates for maintaining operability (that is, maintenance, repairs and small-scale renovations) is made by assigning concrete expended funds in 2009 to 2011 to different lines in the same category. The nominal rates therefore reflect both the temporal and spatial processes.

The sum of products of these nominal rates and the line lengths in each category is the average total costs of maintaining operability of the railway network.

Financial requirement forecast for future

The financial requirement forecast for maintaining railway network operability in future is partly based on the current condition analysis.

The financial requirement of maintenance is forecast based on the current nominal rates with a consideration for the changing lengths of lines in each category. The nominal rates for maintenance works are determined as 50% of the current total nominal costs of maintaining operability.

The need in the total financial allocations of maintaining railway network operability in future is based on an expert estimate of the need for renewal (repairs and renovation) of the different lines.

The calculation is a variation on determining the overall investment requirement; the amounts are not considered as one-off but distributed over the service life years of each railway infrastructure element. At the same time, the totals are not determined based on the proposed (standardised) condition but based on the current range of equipment in each railway line category.

For each of the line categories T0 to T7, we calculated the nominal rates based on an evaluation of an etalon segment (with a back-checking of the total sums of decisive quantities: line lengths, bridges, numbers of stations, etc.). The basic indicators are as follows:

- superstructure
- substructure
- railway bridges and tunnels
- surface constructions (buildings)
- traction lines
- power supply
- wiring, heavy-current
- safety devices
- communications devices

The calculation rates the amounts of the nominal units for the aggregated sub-items of each indicator (track length, number of switches, traction line length, number of switch units connected to the safety equipment, etc.), and appraises them with the unit costs based on the Consultant's simplified rate tariff.

We consider a different renewal period for each of the indicators (e.g., 28-45 years for superstructure depending on line category; approx. 25 years for operating equipment depending on line category).

The above calculation procedure was used to determine the nominal rates of renewal (repairs and renovations) of railway lines.

The determination of the financial requirements in each year also takes into account the expected development in the lengths of each line category.

In contrast to the existing conventional network, the costs of renewal are only included 10 years after implementation for the new lines (Rapid Links).

		2012	2015	2020	2035	2050
Assessed network length	[km]	9260	9255	9230	9410	9618
Maintenance works	[CZK bln]	4.054	4.102	4.185	4.904	5.639
Repairs and renovations	[CZK bln]	4.054	4.102	7.819	16.850	19.427
Total for operability	[CZK bln]	8.108	8.204	12.003	21.754	25.066

Note: The forecast includes a reasonable development of the new line (Rapid Link) network.

Table 33.63 – Forecast of need of total costs of railway network operability in time points (price level 2012, excluding VAT)

The need for a major increase of funds in each year is due to the considerable extent of the network, which has long been underfunded in terms of maintenance. Neglected maintenance and not making major repairs in the required extent then leads to the need to resolve this deficiency with investment measures, which is undesirable for the system. The objective of the recommended increase in fund allocation is to improve this situation. The prerequisite for achieving the required effect of this increase is the provision of adequate and effective absorption capacity for these increased funding needs on the part of the RIA. The process of expending these funds has to be controlled under a maintenance and renewal plan for each railway line based on its importance and physical condition. Larger measures in the form of repairs of entire wholes with clearly identifiable benefits of the funds expended should be preferred.

The funds intended for these activities shall be contractually settled for the long term between the SFTI and the RIA in the sense of the requirements of Railway Package I (Directive 2012/34/EU) along with the introduction of performance monitoring indicators.

33.2 Road infrastructure

In line with RMD approach, the road infrastructure packages are quantified in the text and tables of this chapter as including VAT.

The condition of the backbone road network (RMD being the information source for motorways and expressways, an aggregate estimated based on RMD information for first-class roads) with respect to the required repairs and renovations was assessed in 2009, as shown in the table below.

Category/ Condition %	1 very good	2 good	3 poor	4 very poor	5 unacceptable
Motorways	23.5	38.5	27.8	10.2	0
Expressways	35.7	12.3	27.3	18.3	6.4
First-class roads	6.0	18.0	44.0	22.0	10.0

Table 33.64 – Condition of superordinate road network

Expected future network development

The further planned road network development is expressed by a list of projects (see Report 6.2). The list also includes requirements for certain renovations based on the above estimate.

The objective for the medium to long term according to the MoT and RMD development plans should be as follows:

- 2,180 km of motorways and expressways
- approx. 6,300 km of first-class roads.

The allocation of adequate funds for road maintenance and repairs has to be taken into account when planning construction of new roads. The following aspects need to be taken into account:

- Maintenance, repairs and renovations are technically interconnected and the need for (re)institution of the road management system must be stressed.
- Road maintenance and repairs are costly and neglecting them may result in the need for even costlier renovations.
- Bridge maintenance and repair costs and tunnel maintenance, repair and operation costs are significant in terms of cost requirements (high unit costs, no total costs – in respect of small number of tunnels on the network of Czech Republic.
- For the above reasons, it is necessary to carefully consider the extent of the future road network (based on the predicted traffic volumes and road routing aiming at minimisation of the number of bridges and other constructions, notably tunnels, which are demanding not only on investment but also operation and maintenance).

The required costs of maintenance and repair are high and going to increase depending on the network expansion, and neglecting them will lead to deteriorating network condition and even higher future costs in the form of more extensive renovations.

As with railway infrastructure, road infrastructure too has not historically received adequate funds for systemic maintenance and repairs of roads. In the full version of Book 7, published on the website www.dopravnistrategie.cz, we identified the need to increase the funds and systemise their spending. It is advisable to allocate the funds on larger repairs with longer service life and a clear added value for the users while minimising the number of traffic restrictions, which increases with multiple smaller repairs.

It follows from the analysis made in Book 7 that costs of 1st class roads prevail. The increase of funding allocation is recommended in relation to both the D+R network and the 1st class road network. It is of great importance to ensure efficient spending of the increased funds by the road network manager. It is necessary to bear in mind the “hidden” costs of road maintenance and repairs, which will be replaced with new ones but will mostly continue to exist physically, under different managers in some cases. These costs are not included in the TSS2 requirements.

We have decided to include the identified capital investment in construction or upgrades of motorway and expressway management and maintenance centres among the costs relevant to Package C.

33.3 Waterway infrastructure

Maintenance and routine repairs of hydraulic constructions on waterways are not funded from the resources dealt with in TSS2. Extensive renovations/upgrades are identified among development measures.

33.4 Aviation infrastructure

Aviation has many specific characteristics compared to other transport modes, including differences in the infrastructure required for operating this transport mode.

The operability of airports and the costs of providing it are fully within the responsibilities of the infrastructure owners. The Ministry of Transport therefore has no influence on these activities, which entails a different approach to funding these activities. For aviation infrastructure, they are fully covered from the commercial resources of airport owners/operators. For this reason, they are not taken into account under TSS2 and not included in the total calculated amounts of financial requirements for transport infrastructure operability.

33.5 Other transport infrastructure components

No financial requirements were identified in the other transport infrastructure components that would require coverage from the funds dealt with in this paper. If any such cases should occur notwithstanding, their effect on the overall amount of funds will likely be negligible.

34 Financial requirements – development measures

The financial requirements of the development measures constitute the one of the cardinal portion of the total amount of financial requirements identified under TSS2. The total financial requirements of the development measures in each mode quantified in this chapter are based on the analyses conducted in Book 6 and the other parts of Book 7.

All the stated sums are at the price level of 2012 and will thus be subject to further development caused by inflation in the future.

In line with the manager's approach, the road infrastructure measures are quantified in the text and tables of this chapter as including VAT.

34.1 Railway infrastructure

The financial requirements of development measures on railway infrastructures **were quantified primarily for projects**. The item structure is divided by the measure packages. In particular, we pay attention to Package groups A (Main priorities in transport network construction and upgrading) and B (Support activities for transport infrastructure development).

Measure package	Item	Development measures	Operability improvements	Total
A2.1	Construction of new segments of conventional railway network	16,510,000,000	---	16,510,000,000
A2.2	Upgrading/optimisation/electrification of existing lines	145,526,000,000	22,102,000,000	167,628,000,000
A2.3	Upgrading of junctions and stations	33,066,000,000	1,547,000,000	34,613,000,000
A2.4	Revitalisation of regional lines	350,000,000	22,557,000,000	22,907,000,000
A2.5	Elimination of bottlenecks and local deficiencies	1,300,000,000	160,000,000	1,460,000,000
A2.6	Construction of segments of high-speed lines and rapid links	---	---	---
Total	Package category A2	196,991,000,000	46,366,000,000	243,118,000,000

Table 34.65 – Financial requirements of development measures in railway network, projects (CZK; Package category A2)

For projects in Package category A2, we make separate quantifications for development projects and those projects that can be viewed as operability improvement projects (development projects focusing primarily on improving technical conditions). **These totals do not include the costs of suggestions**, which constitute a considerable part of the measures identified.

Measure package	Item	Development measures
B3.1	Upgrading of safety and communications equipment in TEN-T (incl. ETCS / GSM-R)	15,562,000,000
B3.2	Upgrading of safety and communications equipment outside TEN-T (rationalisation)	Included among projects under Packages A2.2 and A2.4
B3.3	Elimination or securing of level crossings	Financial requirements not determined based on identification of concrete projects

Table 34.66 – Financial requirements of development measures in railway network (CZK; Package category B3)

Concerning suggestions, we identified a number of measures for which the financial requirements cannot be determined even approximately: firstly because the technical scope of the measures cannot be defined, and secondly because their routing has not been stabilised. Therefore, it is an approximate expectation on the basis of the current knowledge of investors.

34.2 Road infrastructure

Concerning road infrastructure, we made a separate quantification of the total costs of the studied measures for projects and for suggestions. The costs are divided in accordance with the classification of the measure packages defined in Book 6. The costs under Package category A1 (Motorway, expressway and first-class road development) are shown in Table 34.67 for projects and in Table 34.68 for suggestions. Besides the total financial requirements of the development measures, the tables also show the total financial requirements the alternative measures, i.e., measures that it would be advisable to implement if some of the development measures were not implemented.

Measure package	Item	Development measures
A 1.1	Construction of new motorway segments	79 950 000 000
A 1.2	Construction of new expressway segments	305 080 000 000
A 1.3	Upgrading of first-class roads	13 606 000 000
A 1.4	Capacity increases and upgrading of motorways and expressways	56 945 000 000
A 1.5	Construction of first-class road bypasses and rerouting	148 787 000 000
CELKEM	Package category A1	604 367 000 000

Table 34.69 – Financial requirements of development measures in road network, projects (Package category A 1, CZK incl. VAT)

Measure package	Item	Development measures
A 1.1	Construction of new motorway segments	-
A 1.2	Construction of new expressway segments	245 413 000 000
A 1.3	Upgrading of first-class roads	18 378 000 000
A 1.4	Capacity increases and upgrading of motorways and expressways	1 858 000 000
A 1.5	Construction of first-class road bypasses and rerouting	212 808 000 000
CELKEM	Package category A1	478 458 000 000

Table 34.70 – Financial requirements of development measures in road network, suggestions (Package category A 1, CZK incl. VAT)

The ITS domain is a separate topic handled under TSS2 (category of package B1). The estimate of financial requirements for ITS development in transport infrastructure is made at the level of measure packages.

The costs of concrete identified measures currently pursued by investors and included in Package category B2 (Safety and the environment) are shown in Table 34.71

Measure package	Item	Measures
B 2.3	Accident site adjustment	133 100 000
TOTAL		133 100 000

Table 34.72 – Financial requirements of development measures in road network, projects (Package category B2, CZK incl. VAT)

The sum identified in Table 34.69 does not cover elimination of all accident-ridden sites. They are only a summary of specific measures that have already been prepared and identified; however, they are in the phase enabling their immediate implementation. Other projects to eliminate or adjust accident-ridden locations (measures of a smaller scale than new construction projects, relocations, etc.) will be prepared and paid from the concerned package B 2.3.

34.3 Waterway infrastructure

The financial requirements on development measures on the waterway infrastructure have been determined based on data from the investor: the WD.

Measure package	Item	Total
A3.1	Elbe Waterway navigability expansion projects	7 762 000 000
A3.2	Waterway capacity increases and upgrades	6 314 000 000
A3.3	Canal construction	---
A3.4	Port and servicing infrastructure	1 602 000 000
A3.5	Recreational waterway development	4 890 000 000
CELKEM	Package category A3	20 568 000 000

Table 34.73 – Financial requirements of development measures on waterways, projects (Package category A3, CZK)

Measure package	Item	Total
A3.2	Waterway capacity increases and upgrades	3 000 000 000

Table 34.74 – Financial requirements of development measures on waterways, suggestions (Package category A3, CZK)

Measure package	Item	Total
B4.1	Water traffic control projects	51 000 000
B4.2	Equipment for improving waterway reliability	30 000 000
CELKEM	Package category B4	81 000 000

Table 34.75 – Financial requirements of development measures on waterways, projects (Package category B4, CZK)

34.4 Aviation infrastructure

Only two development measures for expanding the aviation infrastructure have been identified under TSS2. One is the parallel take-off/landing runway at Václav Havel Airport in Prague; the other is the Replacement of System Data Processing for Air Navigation Service, state enterprise. These two measures, identified as the most important under air transport, are not funded from the state budget or the SFTI, but rather from the operators' resources.

34.5 Other transport infrastructure components

The other transport infrastructure components included in Package group A chiefly involve transport terminals for both passenger and freight transport. Since these are not concrete development measures developed by the State investor but rather a scheme for funding grants, the amount for covering the expected requirements for developing these measures was allocated in Book 10.

34.6 Packages not handled in Book 7

Book 7 handles packages of measures specified in the previous subchapters. The costs of the other packages are only determined in Book 10, also with a view to the available funds.

35 Scenarios for trends in transport infrastructure financial requirements – maintenance, operation and repairs

In the course of works on Book 7, we drew up scenarios of the financial requirement trends, notably for the purpose of calculations within the financial model elaborated in Book 9. The scenarios notably concerned the forecast of financial requirements for maintenance, repairs and renovations of the road and railway infrastructure. We proposed the MIN (minimal), MED (medium) and MAX (maximum) scenarios.

Whereas the MIN scenario was based on the assumption of no further deterioration of the transport infrastructure condition, the MAX scenario assumed expending of such amounts that would permit progressive improvement in the technical condition of the transport infrastructure.

The MED scenario assumes a reasonable retention of the current level of expenditures on maintenance, repairs and renovations until 2015. An increase in the funds available for maintenance, repairs and renovations to the level of the MIN scenario is assumed in 2016, followed by a gradual increase take into account the network expansion.

36 General prerequisites for reducing of financial exigency of new measures

The objective of reducing of financial exigency of constructions is an effort to achieve absolute savings of financial resources (in absolute numbers) as well as an effort to achieve the maximum efficiency of constructions (that is, the relative proportion of costs and benefits).

This objective must be taken into account already during pre-design preparation. Each project must be properly justified, above all, by means of a feasibility study stipulating, among other aspects of a project, also general costs and benefits of alternative measures under assessment. All proposed measures must be sufficiently justified and, therefore, it is necessary to examine a sufficient number of variants, assess their parameters and to subject them to economic assessment.

The range of variants must always be based on a “variant without project“ – that is, on the way of solving a problem if, for some reason, an investment measure is not implemented. In other steps it is necessary to weigh different stages of fulfilment of input assumptions – from partial reconstructions to modernization measures to a proposal of new capacities (new constructions). The alternatives proposed always have to be assessed in reference to the “no project alternative” , especially using the standardised cost-benefit analysis approach and other aspects that are followed up in the feasibility study..

In a case of common assessment of more measures it is appropriate to assess the entire set of measures as a set of constructions. It is also possible to assess the individual logic phases separately, also with respect to possible non-realization of further investment steps (assessment of an independent function of individual phases).

Generally it can be stated that the best is to realize the phase of such a construction which shows the highest benefits and efficiency, even in the case, when its further phases may not be realized.

The economic efficiency indicators determine just one of the parts conditioning the selection of a recommended variant. Despite of that, if results achieved from two or more variants with significantly differing costs are acceptable (or comparable), it is necessary to proceed during selecting a variant for investment in the following way:

- if the price has been set as the decisive factor, the cheaper variant should be selected in order to release reserve funds for other projects,
- if a more expensive project leads to better realization of the main objectives (expectations) and if sufficient financial resources are available, the selection of this more costly variant is permissible.
- Where a more expensive project would implement the main objectives (expectations) better and the necessary funds would not be available, we must always consider whether we can accept the cheaper and less comfortable solution or whether it is advisable to wait until the funds required for the more expensive project are available. The chief criterion is the degree to which the cheaper project leads to fulfilment of the main objectives (expectations) without creating needless extra costs or barriers to the more efficient solution in future.
- Every alternative has to be assessed in terms of the entire project life cycle.

However, the proposal must clarify the way how resulting decisions are adopted. If a variant with worse economic results but better other results is chosen, such a decision must be properly justified.

In order to improve the process of alternative selection the Ministry of Transport will ensure the adoption of the methodology for elaboration of individual parts of feasibility studies in such way that elaborated parts covered all relevant parameters of the project.

37 Summary of main problems

The domain of building new transport infrastructure and managing existing transport infrastructure in the Czech Republic has long been facing many problems that have had a negative effect on the conceptual and efficient development of transport networks as well as management and maintenance of the existing transport infrastructure. Many of these problems have already been identified and designated, yet there has been no turning point so far that would result in a substantial improvement in this area.

This chapter of TSS2 summarises the most serious problems and actions to resolve in order to improve the efficiency of the transport infrastructure management and development. It is based both on previous papers elaborated in the Czech Republic and abroad and the project team's own experience.

The purpose of this chapter is by no means to create a consistent methodological manual – that really goes beyond the scope of TSS2 – but its objective is to propose the main principles leading to a more economic process of procurement of transport infrastructure projects.

A number of papers dealing with the economy and efficiency of investment in transport infrastructure have recently been published. One of the main problems that can be identified, however, is the failure to follow the recommendations contained in these papers. Since the principles presented have not been transformed into practice for various reasons so far, it would be advisable to change the entire approach to this issue. One of the options would be to make a detailed methodology that would elaborate on the principles identified below (based on an assignment by the MoT) and consistently enforce its application, including subsequent inspection.

The cycle of preparing, building and operating the projects can be divided into several basic stages, which are described in the following subchapters; the most important areas of required focus are listed for each of them.

37.1 Development measures – recommended strategy

One the greatest problem in the CR is the long-term absence of a strategic paper that would deal with development of transport infrastructure. The TSS2 document should improve the situation. In this area, attention needs to focus on the following principles:

- Follow recommendations of strategic documents elaborated and approved such as TSS2, and ensure their periodic and professional updating.
- Set priorities and objectives for each area of development of transport infrastructure and monitor and assess them continuously.
- The strategy adopted has to be binding for all the transport infrastructures managers: project planning should then take place so that it would be in line with the concept adopted.
- Agreement of the strategy adopted with the land-use planning processes has to be assured.

- As follow-up on the strategic papers, further methodological papers should be generated, focusing on fulfilling the objectives defined with a view to an efficient process of preparing and implementing of measures. Such papers must surely include:
    - Binding groundwork for project pricing in all phases of project stages, including methodological instructions for its application (periodic updating must also be ensured);
    - Methodology for valuing the project life cycle (i.e., a project and its efficiency has to be view in terms of the costs of its entire life cycle, not only its investment costs). This approach should be applied in all the project planning stages (with a corresponding level of detail);
    - Further methodological papers focusing on definition of binding procedures leading to more efficient transport infrastructure project planning, implementation and operation.

37.2 Plan

The project plan design phase has to emphasis the following areas:

- Develop the plan in multiple alternatives, including assessment of economic efficiency, and then choose the alternative that yields the best results in terms of both economic efficiency and meeting the objectives set by the infrastructure development strategy.
- Develop major structural elements in multiple alternatives, including economic assessment involving the entire life cycle costs.
- Major changes to an already approved alternative have to be verified and confirmed, including the reason for the change and its impact on the project planning process and economic efficiency.
- Introduce mandatory reviewing of each project stage by an independent expert, including review of adequacy/justification of the amount of investment costs.
- It would be expedient to introduce and maintain a system of information on plans in preparation (similar for each type of transport infrastructure). The basic information has to be continuously monitored, registered and updated in the form of a database (development project database), stating the decisive indicators on at least the following areas:
    - project identification data (section, number within transport network, category, project description, project justification, etc.);
    - project planning and approval status (status of documentation elaborated so far, the approval process, basic milestones in the project planning);
    - project technical and technological indicators (length, speed, interoperability elements, etc.);

- project implementation costs (total investment cost and expected distribution of investment costs over the implementation time);
- project financial and economic indicators (results of economic assessment and requirements on European Funds);
- any other data needed for administrative processing by the investor, Ministry of Transport and other institutions.

(Note: Only the RMD currently has such a system, but the quality and accuracy of the information in time is often not guaranteed.)

37.3 Project documentation

- Apply the “value for money” principle, which will guarantee the quality of the proposed designs, and precisely specify the requirements of the project.
- Technical standards: Even existing standards allow options that may ultimately make projects cheaper even if required parameters are retained; the question is whether these options are used. At the same time, it must be said that the technical standards, regulations and requirements contain many points where an adjustment to the technical design requirements would be advisable with a positive impact on project financial requirements while retaining the necessary project quality and safety.
- Project pricing: The current unit prices often do not correspond to the real-world requirements for good workmanship; some of the unit prices are undervalued, others are disproportionately high (the need of availability of current pricing groundwork; see above).
- In tenders for contractors, set the price of the project expected based on the project documentation, which shall be taken as the highest admissible price in the tender.
- Develop tender documentation down to the project implementation level, preventing the emergence of a large portion of extra works. The level of detail of the documentation may however not discriminate against tenders by predetermining specific types of parts of the work.
- The success of a tender depends on all the previous stages of the project cycle (see above paragraphs).

37.4 Construction

- Do not assign projects before the building permit or most permits related to the main route and major structural elements attains legal force.
- Boost the role of the project supervisor, focusing chiefly on quality inspection and billing inspection.
- Boost the role of project managers. Consistent inspection of the project in construction in terms of both quality and scope is essential. Make managerial penalties also applicable depending on the nature of the defects identified in the warranty period.

- Do not permit any substantial changes to the project design during construction.
- Precisely define all the requirements beyond the project assignment and have the guilty party pay for them.
- After related risks have been assessed, to consider alternative models of construction works assigning, i.e. to admit a higher level of invention on the contractor's side. However, in the first phase, apply this exclusively on minor projects or, as the case may be, major repairs that will not be financed from EU. Consequences of this manner of assigning for life-cycle costs must be considered. In the case of positive experience, develop this model further.

37.5 Project assessment and maintenance

- Consistently exercise system of complaints against the contractor during the warranty period. Evaluate possibilities how to get the contractor concerned with the costs of repairs and maintenance in a longer time horizon as compared to the past
- Assess projects with respect to their meeting of the expected effects. In projects co-funded by the European Investment Bank, there has historically been an approach of final assessment of the programme implemented, including assessment of project economic efficiency based on the actually achieved parameters.
- Monitor the service life of the works done and major structural elements (e.g., roadway constructions, bridge tails and bearings, bridge roadways). It has been shown in practice, unfortunately, that the service life of identical constructions is often diametrically different (significant impact on the project life cycle costs).
- It would be expedient to also deal with analysis of errors committed during the implementation projects and subsequent drawing of conclusions and measures to prevent them from recurring.
- Respect stipulated technical conditions for maintenance of the different structure types.
- Monitor and assess structural maintenance, repairs and renovations in terms of costs and service life of works performed.
- The economy of repair and renovation projects is conditional upon sufficient quality and extent of diagnostic surveys. Unfortunately, the current practice does not match this. It is advisable to get the design engineer concerned with the life cycle costs of a construction with the aim of their optimization.

In relation to these recommendations which were, not for the first time, identified within works on TSS2, it is necessary to state the fact that the Ministry of Transport and individual subordinate organizations (RMD, RIA, WD) adopted already during the years 2011-2013 a number of measures (internal regulations) which are in accordance with these recommendations and should contribute to rectification of the said facts. Book 10 deals partially with concrete measures.

Book 8 – Evaluation of Transport Infrastructure Projects

38 Summary of the methodology

Book 8 - Evaluation of Transport Infrastructure Projects consists of Report Z.8.1 - Project Evaluation Using CBA and MCA - Methodology, Report Z.8.2 - Final Sequence of Projects, and Report Z.8.3 - Detailed Results of CBA and MCA analyses.

The object of Report Z.8.1 is description of the selected methodological approach to evaluation of the proposed measures under the project Transport Sector Strategies, 2nd Phase, Mid-Term Plan of Transport Infrastructure Development with a Long-Term Forward-Looking Perspective.

Report Z.8.2 presents summary results of the carried out multilevel multi-criteria evaluation of individual clusters and subsequently also for the projects and suggestions on the basis of the methodology proposed.

The particular scoring of individual criteria and sub-criteria for the individual clusters represent then the subject-matter of Report Z 8.3, within the framework of which a software tool for cluster evaluation has been developed. This tool that has been created in MS Excel spreadsheet contains a database of individual cluster's data and evaluation of the defined criteria and sub-criteria.

The main objective of the evaluation of the proposed measures in this strategy is to enable development of an efficient, yet pragmatic mid-term and long-term plan of implementation of larger development projects and suggestions that:

- As regards the time schedule, gives priority to projects that are more urgent from the point of view of transport and more beneficial for the whole society but at the same time;
- Leaves a priority space for the "unquestionable" projects;
- Adequately sets a horizon for implementation of measures according to the applied time schedule and feasible time of preparation;
- Returns projects (or suggestions) which are very difficult to be implemented due to their weak or impractical concept to be redrafted.

The following terms have been specified for the evaluation purposes:

- "Project" – a designed infrastructure measure for which there is detailed information available, e.g. from documents that have already been drawn up. The projects are planned to be implemented especially in a mid-term horizon (in years to 2014 to 2020, with an overlap to 2023).
- "Suggestion" - an unspecified infrastructure measure which may usually be expected to be implemented no sooner than in a long-term horizon. Project preparation is planned for suggestions in the mid-term horizon.

For the purposes of transport modelling and evaluation, projects and suggestions are classified under project clusters (coherent sets of measures, communication routes).

The time horizons of the evaluation are as follows:

- Mid-Term horizon (MT) - from 2014 to 2020 (with an overlap to 2025)
- Long-term horizon (LT) – from 2020 to 2035 (the period of 2035 through 2050 is perceived as an outlook containing a reserve pool of measures for further development "D")

The objective of the evaluation is to identify such infrastructure measures that meet the 3P principle - Potřebnost (necessity), Průchodnost (viability) and Proveditelnost (feasibility), which is taken into account in the evaluation.

As regards measures that will not fully meet this principle, the methodology will also enable to determine the need for changes in individual parameters so that the principle can be met. A practical proposal of changes concerning disproportionate investment costs are also be contained in Book 7.

Evaluation of clusters of projects or suggestions is done by means of the multi-level multi-criteria evaluation (MMA). The evaluation has been set so that the measures are considered with respect to fulfilment of the objectives set in the European and National Transport Policy and Transport Strategies (Book 5).

MMA consists of the following three pillars of evaluation (evaluation perspectives):

- Pillar 1 - transport & social - evaluates the reasons to implement a measure.
- Pillar 2 - territorial & environmental - evaluates expected obstacles to implementation of a measure and negative impacts.
- Pillar 3 - economic - evaluates economic efficiency of measures of projects.

Pillar 1 and Pillar 2 are comprised of the multi-criteria analysis (MCA), Pillar 3 contains the simplified cost-benefit analysis.

Suggestions are evaluated only in Pillar 1 and 2 due to lacking detailed information for the economic analysis, except for the measures recommended to be included under the mid-term horizon evaluated in the three pillars. For the suggestions, the investment utilization indicator (IVI) is calculated

The main inputs to MMA are from Book 6 (Measures on Transport Infrastructure) and Book 4 (Transport Forecast Model).

The weights of the criteria and pillars are determined by a wide group of interested entities.

The result is sequence of projects in the individual transport modes that are comparable and create input data for Book 10 where the transport infrastructure development schedule is created in connection with available financial resources of the selected funding variant.

39 Methodology of the Multi-Level Multi-criteria Evaluation (MMA)

Inputs to the multilevel multi-criteria evaluation (MMA) include the projects and suggestions included in the general group of packages A (The Main Priorities of Construction and Modernization of Transport Networks).

MMA consists of the following steps:

1. **Preparation of proposed measures**
   - Pre-classification of proposed measures, division of clusters to projects and suggestions, determination of the time horizon for the prospective commencement of implementation
2. **Multi-criteria analysis of clusters**
   - Projects: 3 pillars (transport & social, territorial and environmental, economic)
   - Suggestions: 2 pillars (transport & social, territorial and environmental)
   - Investment utilization indicator (IVI) for suggestions instead of the economic pillar
3. **Defining the final sequence**
   - Projects to be implemented
   - Suggestions to be prepared
   - Insufficiently documented suggestions proposed to be supplemented with additional information and, if need be, newly assessed by MCA (by TSS2 update)

Projects were re-sorted into categories. There is a identification of those projects that are in progress and have been determined, in agreement with the contracting authority, the ex-ante evaluator and SEA evaluator, as projects where potential discontinuation of works would be significantly wasteful or would lead to critical complications in transport. The other construction projects that are in progress, have been contracted for or are a subject-matter of the state's obligation shall be a subject-matter of MCA as well as CBA.

The projects which no detailed information is available for (the documentation and budgets of investment costs has not been drawn up), **are further evaluated as suggestions**. The earliest possible time horizon for construction commencement shall be determined for each measure.

The multilevel multi-criteria analysis shall is carried out in 3 independent pillars for projects (including zCBA) and in 2 pillars for suggestions (without zCBA).

The first transport & social pillar evaluates the reasons to implement a measure using MCA.

Evaluation in **the second territorial and environmental pillar** uses in MCA the criteria taking into account expected impediments to implementation of measures.

The third economic pillar contains simplified cost-benefit analysis (zCBA). The economic efficiency indicator shall be the output value. This value shall be converted to a scoring evaluation by means of a scoring scale. ZCBA is drawn up for project clusters. It is not possible to create a meaningful zCBA for suggestions for the reason of insufficient input information.

The outcome of MMA shall be the scoring results from 3 or 2 pillars, as the case may be. An analysis is executed among the pillars once again, using the weights of mutual importance of these pillars, and the total score of a cluster of projects or suggestions shall be determined. Besides evaluation in the pillars, the investment utilization indicator is quantified for the suggestions, which contains information on investment intensity for achievement of the result, it means utilisation of the infrastructure with transport. The investment utilisation indicator (IUI) is quantified in [CZK/passkm] and [CZK/tkm] respectively. The lower the IUI value, the better the assumption of achieving economically efficient parameters of the measure. The IUI was then converted to point degrees; the higher the IUI point value, the more favourable the result for comparability with the point scales of the other pillars.

MMA measure of transport infrastructure in an open and flexible tool that can be updated regularly, thus upon completion of the project design documentation of the suggestions it is possible to supplement information and it is possible to transfer the suggestion into project evaluation.

The following Figure 39.18 shows the MMA methodology.

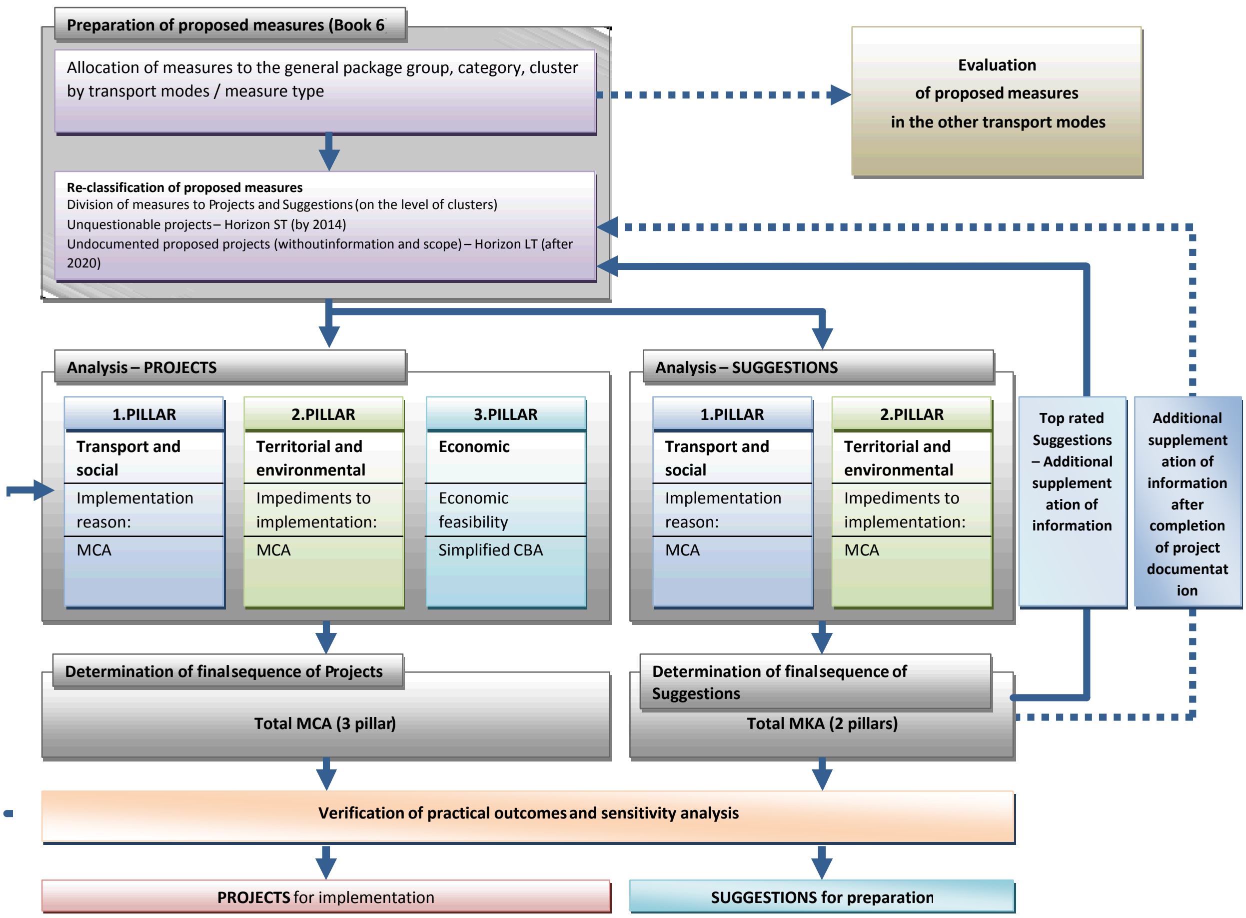


Figure 39.18 – Methodology of the Multi-Level Multi-criteria Evaluation (MMA)

40 Methodology of the multi-criteria analysis (Pillars 1 and 2)

The methodological process of MCA designed under this project comprises of the following sequential steps:

1. **Setting the context of the decision-making process**
    a. setting of objectives MCA
    b. identification of the key and other interested entities[9]
2. **Identification of the assessed options** (measure packages, measures)
3. **Summary of priorities and objectives for the Transport Strategies**
4. **Identification of the criteria of Pillar 1 – transport & social – the reasons for implementation**
    a. **Road transport**
    b. **Railway transport**
    c. **Waterway transport**
    d. **Air transport**
5. **Identification of the criteria of Pillar 2 – territorial and environmental – impediments to implementation**
6. **Scoring -** a draft of the scoring scale
7. **Weighing** – allocation of weight to each criterion and sub--criterion that takes into account their relative importance for decision-taking.
8. **Combination of weights and scores** for each option to obtain final value.

An important criterion for the evaluation is also the importance of a project for transport and its real need under the national transport system.

The input to MMA is the general group of packages A, and it is evaluated from the point of view of all the above mentioned transversal priorities and objectives.

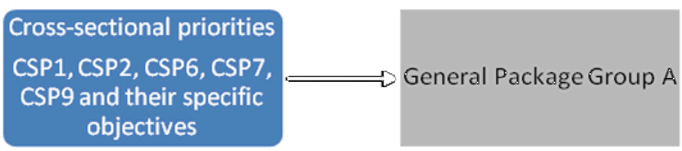


Figure 40.19 – The general group of packages A is evaluated in MMA

9 Including NGOs, representatives of the general public, universities, respective state authorities and regional authorities

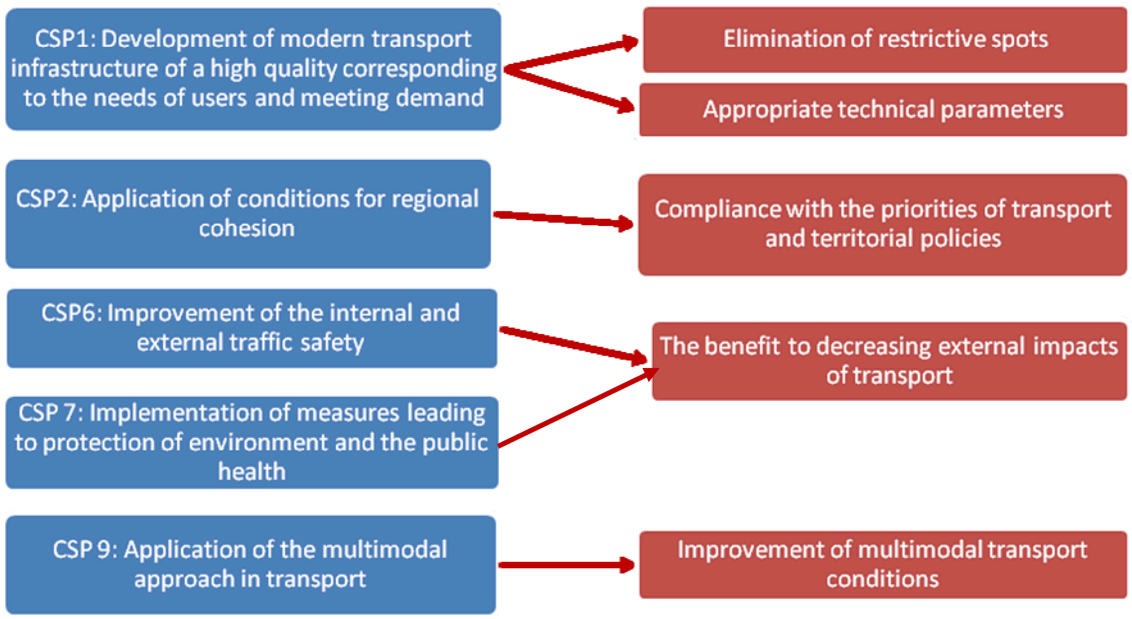
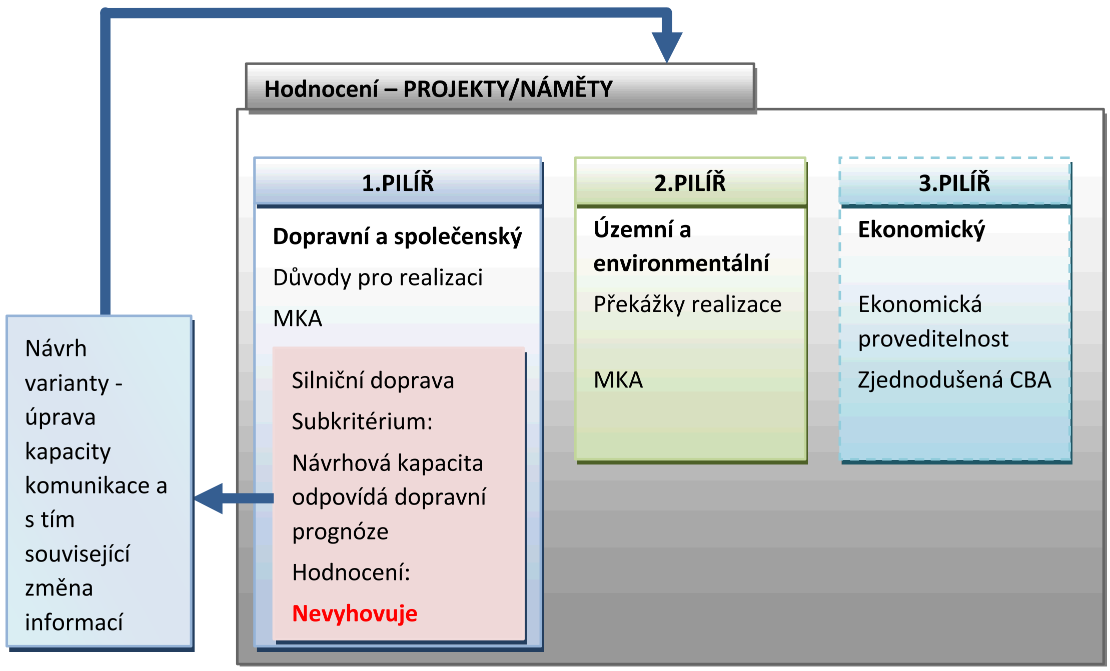


Figure 40.20 – Links of criteria in Pillar 1 to the transversal priorities

Pillar 1 covers all transversal priorities and specific objectives of individual transport modes stated.



The design capacity corresponds to the transport forecast

Figure 40.21 – MMA methodology – road transport – procedure in case of non-fulfilment of the conditioning sub-criterion

41 Methodology of the simplified cost-benefit analysis - Pillar 3

The simplified cost-benefit analysis (zCBA) represents an independent pillar of the multi-level evaluation of defined clusters of the infrastructure measures. This is economic evaluation of the monitored clusters of **projects**.

The best evaluated suggestions which aspire (as regards their readiness) to be constructed in the mid-term horizon and where it is possible to supplement information (estimate of investment and operating costs), will be additionally evaluated also under this Pillar 3 so that there would be an approximate opportunity for their comparison to projects.

With regard to the fact that within the project of the Transport Sector Strategies, 2nd Phase, the clusters are evaluated on the strategic level where the clusters on various levels of technical preparedness are evaluated, the decisive result will not be the usual economic indicator BCR or NPV but the so-called **indicator of economic efficiency (IEF).** Concurrently, it means that the IEF indicator does not substitute a need of a detailed CBA which must be prepared within the scope of economic evaluation of concrete projects (feasibility study, project plans). It concerns only indication of possible risks in further preparation of a concrete measure. The scoring scale will be determined on the basis of the probability distribution of resulting values of the economic efficiency indicator, while the maximum number of scores will correspond to the maximum number of scores possible to be achieved in the remaining two pillars (200 points). The basic scheme of the unified approach to executing zCBA (to the determination of the economic efficiency indicator):

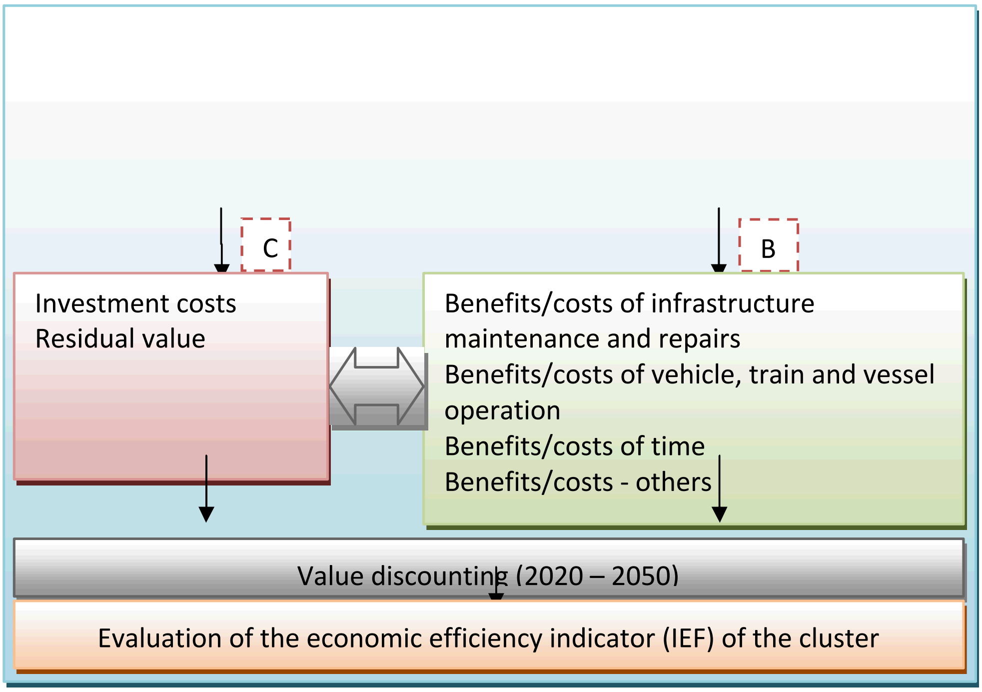


Figure 41.76 – Methodology of the simplified CBA (zCBA)

41.1 Outcomes from zCBA

The outcome from zCBA is the economic efficiency indicator (hereinafter referred to as IEF).

The resulting indicator called IEF is defined with the following formula:

$$IEF_{(m-n)} = \frac{\sum_{y=1}^{y'} \left(\frac{OaM_{y(m-n)} + VOC_{y(m-n)} + VOT_{y(m-n)} + ON_{y(m-n)}}{(1+i)^{y-1}} \right)}{IN - \frac{ZH}{(1+i)^{30}}}$$

where:

IEF(m-n)	the ratio indicator called the economic efficiency indicator
m	the final year of the evaluation
n	the reference year of evaluation
i	the determined discount rate
y	a variable acquiring values from n to m (evaluation year)
VOC	benefits from decreased vehicle operating costs
VOT	benefits from time savings
ON	other benefits
IN	investment costs of a cluster
OaM	costs of the infrastructure maintenance and repairs
ZH	cluster residual value

42 Final evaluation methodology - Pillars 1, 2 and 3

42.1 Pillar 1 – transport and social – MCA

Road transport

Criterion	Weight	Sub-criterion	Weight	State	Points
Compliance with the priorities of transport and territorial policies	**26%**	A part of the TEN-T network, D+R, Class I, type B, C, D	7%	TEN - T, D+R	2
				Class I, B, C, D, international roads E	1
				Not a part	0
		Regional transport priority	5%	Approved priority	2
				Non-approved priority	1
				Not a part of the priorities	0
		Development axis, area (ZÚR, PÚR)	5%	Making a part of the development axis - line character	2
				Making a part of the development area	1
				Not a part	0
		Support to territorial cohesion – support to economically weak regions	4%	New connection to the core network (TEN-T) or connection of a catchment centre to the regional city/capital city within the extent of direct connections	2
				Improved connection to the core network (TEN-T) or connection of a catchment centre to the regional city/capital city within the extent of direct connections	1
				Without any influence	0
		Support to European territorial cohesion	5%	Cross-border project	2
				Impact on border transport	1
				Without any influence	0
Elimination of restrictive spots	**27%**	Removal of identified capacity bottlenecks	6%	Elimination of current capacity limits	2
				Elimination of future capacity limits	1
				Is not a problem or, in other words, does not have any influence	0
		Elimination of congestions - spot restrictions	6%	Elimination of capacity limits – permanent phenomenon of congestion creation	2
				Elimination of capacity limits – variable phenomenon of congestion creation	1
				Is not a problem or, in other words, does not have any influence	0
		Eliminations as regards vertical clearances and	5%	Elimination as regards vertical clearances	+1

Criterion	Weight	Sub-criterion	Weight	State	Points
		restrictions of the loading capacity		Elimination as regards restrictions of the load bearing capacity	+1
				Is not a problem or, in other words, does not have any influence	0
		Separation of slow traffic	5%	Separates	2
				Separates after a change in the road category has been implemented	1
				Is not a problem, does not have any influence	0
		Elimination of spots with local speed restriction	5%	Elimination of limits	2
				Reduction of limits	1
				Is not a problem or, in other words, does not have any influence	0

Criterion	Weight	Sub-criterion	Weight	State	Points
Technical and operational parameters	**14%**	The design capacity corresponds to the transport forecast		UKD C	2
				UKD B,D	1
				Non-compliant	!
Improvement of the multimodal transport conditions	**12%**	The benefit to improvement of the quality of the multimodal transport conditions		Freight	+1
				Passenger	+1
				Is not a problem or, in other words, does not have any benefit	0
The benefit to decreasing external impacts of transport	**21%**	Decreased noise and emission burden in the built-up area	7%	Decreased emissions or diverting traffic outside the residential area in AIAQ	+1
				Decreased noise	+1
				Is not a problem or, in other words, does not have any benefit	0
		Diverting traffic outside ecologically valuable areas	5%	Diverting traffic	+1
				Limitation, diverting a part of the traffic	+1
				Is not a problem or, in other words, does not have any benefit	0
		Elimination of accident-prone sites	9%	Elimination of an accident-prone site	2
				Limitation, diverting a part of the traffic	1
				Without any influence	0
Maximum non-weighted score					30
Maximum weighted score					2
Maximum weighted score x 100					**200**

Table 42.77 – Pillar 1 – road transport

Railway transport

Criterion	Weight	Sub-criterion	Weight	State	Points
Compliance with the priorities of transport and territorial policies	**19%**	A part of the TEN-T network, FC, connecting a regional city to high-quality railway network	5%	TEN - T, FC	2
				Connecting a regional city to a quality railway network	1
				Not a part	0
		Regional transport priority	4%	Approved priority	2
				Non-approved priority	1
				Not a part	0
		Development axis, area (ZÚR, PÚR)	4%	Making a part of the development axis - line character	2
				Making a part of the development area	1
				Not a part	0
		Support to territorial cohesion – support to economically weak regions	3%	New connection to the core network (TEN-T) or connection of a catchment centre to the regional city/capital city within the extent of direct connections	2
				Improved connection to the core network (TEN-T) or improved connection of a catchment centre to the regional city/capital city within the extent of direct connections	1
				Without any influence	0
		Support to European territorial cohesion	3%	Cross-border project	2
				Impact on border transport	1
				Without any influence	0
Elimination of restrictive spots	**27%**	Removal of identified capacity bottlenecks	10%	Insufficient capacity during the whole day or, as the case may be, more types of capacity restrictions	2
				Insufficient capacity in peak hours, problems in constructing train traffic schedule, lacking platform edges	1
				Is not a problem or, in other words, does not have any influence	0
		Removal of a technical restraint (TTZ, PP, gradient)	7%	Elimination of a local restriction of the track loading class or the structure gauge	+1
				Decreased longitudinal gradient of the route or extension of the train length norm	+1
				Is not a problem or, in other words, does not have any influence	0
		Removal of local slumps in the line speed	10%	Elimination of local speed limits (slow running on railway level crossings, etc.) - 30 km/hour and more	2

				Elimination of local speed limits (slow running on railway level crossings, etc.) - up to 30 km/hour	1
				Is not a problem or, in other words, does not have any influence	0
Technical and operational parameters	**23%**	Improvement of line facilities	5%	Introduction of safety devices of the 3rd category	+1
				Increased height of platform edges up to 550 mm	+1
				Without any influence	0
		Improvement of the quality of the integrated fixed interval schedule and transfer connections in nodal stations	6%	Impact on the national integrated fixed interval schedule	+1
				Impact on the regional integrated fixed interval schedule	+1
				Without any influence	0
		Electrification	5%	Yes	2
				No	0
		Significant contribution to increasing of critical running speed	7%	Introduction of a higher critical running speed exceeding 20 km/hour	2
				Introduction of a higher critical running speed up to 20 km/hour inclusive	1
				Is not a benefit	0
Change in transport labour division and intermodal interface	**19%**	Transport shifted from road transport - freight carriage	6%	Above 10 %	2
				Up to 10 %	1
				Without any influence	0
		Transport shifted from road transport - passenger transport	5%	Above 10 %	2
				Up to 10 %	1
				Without any influence	0
		Benefit to improvement of the quality of the multimodal transport conditions	4%	Freight	+1
				Passenger	+1
				Without any influence	0
		Railway connection to an international airport	4%	Long-distance	+1
				Regional	+1
				Without any influence	0
Benefit to decreasing external impacts of transport	**12%**	Decreased noise burden in the built-up area	5%	Diverting routes of some trains of passenger and long-distance transport from the built-up area	+1
				Implementation of noise reducing measures	+1
				Without any influence	0
		Benefit to the solution of safety for passengers and other traffic	7%	Implementation of a grade-separate access for passengers	+1
				Implementation of a grade-separated crossing with a road	+1
				Without any influence	0

Maximum non-weighted score	36
Maximum weighted score	2
Multiplier α	1.18
Maximum weighted point value of the system of criteria (including preferential sub-criteria)	2.36
Maximum weighted point value of the system of criteria (including preferential sub-criteria) x 100	**236**

Table 42.78 – Pillar 1 – railway transport

Waterway transport

Criterion	Weight	Sub-criterion	Weight	State	Points
Compliance with the priorities of transport and territorial policies	**23%**	Making a part of the TEN-T network, connected to a significant transport centre	6%	TEN - T	2
				Connection to an important transport centre	1
				Not a part	0
		Influence on prolonging a waterway	4%	Extension of a waterway of Class IV and higher	2
				Extension of a waterway of the other classes	1
				Without any influence	0
		Regional transport priority	4%	Approved priority	2
				Non-approved priority	1
				Not a part	0
		Development axis, area (ZÚR, PÚR)	4%	Making a part of the development axis - line character	2
				Making a part of the development area	1
				Not a part	0
		Support to European territorial cohesion	5%	Cross-border project	2
				Impact on border transport	1
				Not a part	0
Elimination of restrictive spots	**22%**	Removal of capacity limits	11%	Elimination of restriction of passenger and cargo shipping	2
				Elimination of restriction of passenger shipping/recreational navigation	1
				Without any influence	0
		Removal of limits as regards vertical clearances and draught	11%	Elimination of limits as regards vertical clearances	+1
				Elimination of limits as regards draught	+1
				Does not eliminate	0
Technical and operational parameters	**17%**	Increased navigability as regards travel time reliability		Securing navigability for 345 days a year	2
				Prolonged navigability period in a year, extended daily hours of operation	1
				Without any influence	0
Change in transport labour division and intermodal interface	**23%**	Transport shifted from road transport - freight carriage	12%	Above 10%	2
				Up to 10%	1
				Without any influence	0
		Benefit to improvement of the quality of the multimodal transport conditions	11%	Freight	+1
				Passenger	+1
				Without any influence	0

Criterion	Weight	Sub-criterion	Weight	State	Scoring
Benefit to decreasing external impacts of transport	**15%**	Benefits for improvement of permeability of a territory	7%	Improved conditions for the other transport modes (improved parameters/new bridges)	2
				Improved conditions for pedestrians (new bridges, footbridges, ferriages)	1
				Without any influence	0
		Benefits for navigation safety	8%	Increased safety during flooding situations	+1
				Increased safety during decreased visibility	+1
				Without any influence	0
Maximum non-weighted score					26
Maximum weighted score					2
Multiplier α					1.14
Maximum weighted point value of the system of criteria (including preferential sub-criteria)					2.28
Maximum weighted point value of the system of criteria (including preferential sub-criteria) x 100					**228**

Table 42.79 – Pillar 1 – waterway transport

Air transport

Criterion	Weight	Sub-criterion	Weight	State	Points
Compliance with the priorities of transport and territorial policies	**21%**	Part of the TEN-T network	6%	TEN -T – core network	2
				TEN-T – comprehensive network	1
				Not a part	0
		Implementation of the Single European Sky project	6%	Will contribute to implementation of the project	2
				-	-
				Without any influence	0
		Regional transport priority	4%	Approved priority	2
				Non-approved priority	1
				Not a part	0
		Development area (ZÚR, PÚR)	5%	Making a part of the development area	2
				-	-
				Not a part	0
Elimination of restrictive spots	**18%**	Elimination of capacity limits		Elimination of current capacity limits	2
				Elimination of future capacity limits	1
				Is not a problem or, in other words, does not have any influence	0
Technical and operational parameters	**27%**	The capacity of runways corresponds to the prospective demand	13.5%	Fully used capacity	2
				Partially used capacity	1
				Minimally used capacity	0
		Increased quality of air traffic	13.5%	Decrease in the average delay per flight	2
				-	-
				No influence on the average delay per flight	0
Benefit to decreasing external impacts of transport	**34%**	Increased safety of air traffic	16%	Will lead to increased safety	2
				-	1
				Without any influence	0
		Decreased noise burden in the built-up area	18%	Benefit to decreased noise	2
				-	-
				Without any influence	0
Maximum non-weighted score					18
Maximum weighted score					2
Maximum weighted score x 100					**200**

Table 42.80 – Pillar 1 – air transport

42.2 Pillar 2 – territorial and environmental – MCA

Criterion	Weight	State	Negative points
Compliance with the land use documentation	**36%**	The project is not incorporated into the land use documentation and a significant territorial conflict may be expected	-2
		The project is not incorporated into the land use documentation but no significant territorial conflict is known	-1
		The project has been incorporated into the land use documentation	0
New noise impacts on the built-up area[10] - road and railway transport	**28%**	High building density of the area affected with noise	-2
		Medium building density of the area affected with noise	-1
		Minimum building density of the area affected with noise	0
Emission impacts on the sensitive areas – road transport	**21%**	Intensity 15,000 vehicles/day and more in the sensitive areas (urban area, areas with impaired air quality large-scale specially protected areas, Natura 2000).	-2
		Intensity 10,000 vehicles/day and more in the impaired air quality areas	-1
		Without any influence	0
Impacts on the nature and countryside	**15%**	Territorial conflict with large-scale specially protected areas or Natura 2000 network	-2
		Territorial conflict with areas of general protection (natural parks)	-1
		Without significant impact on specially protected areas, Natura 2000 network and areas of general protection (natural parks).	0
Maximum non-weighted score			-8
Maximum weighted score			-2
Maximum weighted score x 100			**-200**

Table 42.81 – Pillar 2

[10] The designed building density percentage shall be modified after completion of noise burden modelling of all monitored clusters and determination of the highest and the lowest impacts.

42.3 Pillar 3 – economic - zCBA

The methodology of the third economic pillar of the simplified cost-benefit analysis is described in Chapter 41. The resulting value of Pillar 3, the economic efficiency indicator, is graduated on the scale of 200 points.

The comparative transformation function is derived for the qualitative evaluation of the economic criterion. This method is especially suitable for purely technical-economic problems of the analysis and decision-making. The transformation function is also known as the rating curve.

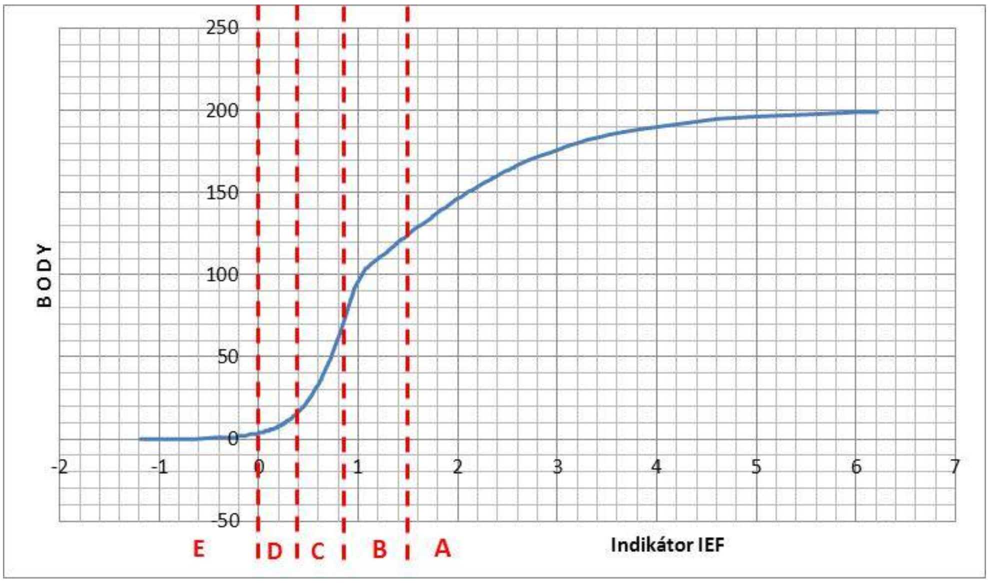


Figure 42.22 – Rating curve of the economic criterion according to IEF

Evaluation	IEF	Points	Note
A	>1.5	>124	Unquestionable economic benefit
B	0.85 – 1.5	71 – 124	On the edge of utility
C	0.4 – 0.85	17 – 71	
D	0.0 – 0.4	0 – 17	Generating benefits
E	<0.0	0	Projects with economic costs

Table 42.82 – Scoring table

43 Multilevel multi-criteria evaluation (MMA) – final sequence

43.1 Resulting points in individual pillars

The evaluation has been drawn up according to individual criteria and sub-criteria in three pillars for each cluster. Thus in each of the pillars, the evaluated cluster may obtain 0-200 points (however, in case of Pillar 2, this is negative evaluation, thus the higher gain of points, the higher threat of negative impacts on the area and the environment, therefore the minus sign is used).

Thus each cluster obtains certain score in each of the three pillars as documented in the table below.

Cluster - projects	Evaluation		
	Pillar 1	Pillar 2	Pillar 3
Cluster 1	120	- 24	95
Cluster 2	95	0	120
etc.	163	- 80	111
Cluster - suggestions	**Evaluation**		
	Pillar 1	**Pillar 2**	**Pillar 3**
Cluster 1 - suggestions	115	- 100	120
Cluster 2 - suggestions	45	0	12
etc.	35	- 80	9

Table 43.83 – Example of the resulting score evaluation of the project clusters

With respect to the evaluation of clusters at a strategic level (details of inputs of a strategic transport model), it is not appropriate that the order of clusters be determined on the basis of each individual obtained point.

Further, the system of multi-level evaluation contains both positively directed points, and negative point value. And it is not methodically correct to add up resulting point values in pillars and thus to obtain only one point value on the basis of which it would be possible to draw up the resulting order.

For these reasons, there was selected a procedure for the drawing up the resulting order, which is described in detail in the following chapter.

43.2 Methodology of determination of the final sequence

There are stipulated two evaluation results for the resulting order of clusters:

- Resulting point evaluation of clusters in individual pillars is divided into ten **point levels** (10 -1) and from there follows a **weighted total of point levels**.
- Resulting point evaluation of clusters is subsequently divided into five **levels of evaluation mark** A, B, C, D, E (high, higher medium, medium, lower

medium, low), and from these levels of marks there follows a resulting **band of evaluation**.

43.2.1 Point level and weighted total of point levels

The economic pillar achieves gain of points of 200 points for the best projects (which is given by the methodology of determination of points for the minimum and maximum resulting value of IEF) and in the remaining two pillars, the gain of points is given by fulfilment rate of individual criteria where neither in Pillar 1 nor in Pillar 2 the project achieves the maximum value. Thus the importance of the economic pillar is growing. In order to eliminate this phenomenon, the achieved scores in the remaining two pillars have been modified similarly as in case of the economic pillar, i.e. 200 points have been assigned to the project that has gained the highest scoring and the other points have been increased accordingly.

The point scale 1-10 is used for uniform classification of gains of points of individual projects identically in all pillars, namely as follows:

Scale	10	9	8	7	6	5	4	3	2	1
Pillar 1 - road	200 - 180	180 - 160	160 - 140	140 - 120	120 - 100	100 - 80	80- 60	60- 40	40- 20	20- 0
Pillar 1 - railway	235- 211.5	211.5- 188	188- 164.5	164.5- 141	141- 117.5	117.5- 94	94- 70.5	70.5- 47	47- 23.5	23.5- 0
Pillar 1 - water	227- 204.3	204.3- 181.6	181.6- 158.9	158.9- 136.3	136.2- 113.5	113.5- 90.8	90.8- 68.1	68.1- 45.5	45.5- 22.7	22.7 - 0
	High transport-social benefit					*low transport-social benefit*				
Pillar 2	0- -20	-20 – -40	-40 – -60	-60 – -80	-80 – -100	-100 – -120	-120 – -140	-140 – -160	-160 – -180	-180 – - 200
	Low territorial-environmental risk/impact						*high territorial-environmental risk*			
Pillar 3	200- 180	180- 160	160- 140	140- 120	120- 100	100- 80	80- 60	60- 40	40- 20	20- 0
	High socio-economic benefit							*low socio-economic benefit*		

Table 43.84 – Resulting point scale (10 – 1) in individual pillars

From the above-mentioned table it follows that the higher point level, the better evaluation of the cluster is.

Weighted total of point levels

Within the process of determination of weights, the experts addressed[11] have determined also the significance of the individual pillars, namely with the following weights:

[11] Representatives of the sector organizations and the Ministry of Transport, other relevant stated authorities, representatives of the general public, SEA evaluator, representatives of all regional authorities. The list of names of the attendees is provided in the full version of Book 8, which is available at www.dopravnistrategie.cz

Pillar	Weight
Transport and social - MCA	**51%**
Territorial and environmental - MCA	**18%**
Economic - zCBA	**31%**
The Saaty's method was used for determination of the resulting weights.	

Table 43.85 – The weights of evaluation perspectives (pillars)

With the aid of such determined weight, there was determined for each cluster the so called **weighted total of point levels**.

With respect to the value of the weighted total of point levels it pays that the higher weighted total of point levels is, the better evaluation of the cluster is. Maximum weighted total of point levels being 10 points.

43.2.2 Level of evaluation mark and band of evaluation

Resulting point evaluation of the cluster in individual cluster is further assigned to the so called level of evaluation mark A - E.

Level of evaluation mark is a basic output value for determination of the resulting order of clusters which exactly characterizes the extent of importance, or efficiency of the cluster.

Evaluation of Pillar 1 results – transport and social

The distribution into individual evaluation mark levels A, B, C, D, E has been assigned to the resulting scoring of all clusters in Pillar 1 as follows:

Level of score evaluation	Minimum of points	Maximum of points
Level A	>150	200*
Level B	>105	150
Level C	>50	105
Level D	>15	50
Level E	0	15
* *For railway transport, the maximum value is 236 points, for waterway transport 228, namely because of the preferential criteria existence (see Chapter 40 resp. 42.1)*		

Table 43.86 – Cluster evaluation levels in Pillar 1

Level of evaluation mark A means a high traffic and social importance, level B means a higher-medium traffic and social importance, etc., and level E means a low traffic and social importance.

Evaluation of Pillar 2 results – territorial and environmental

The resulting scoring of all clusters in Pillar 2 achieves the values from -200 points, which means significant risk of threat to the area and environment due to implementation of a cluster of measures, to 0 points, thus no impact. In this case, division into scales has been chosen according to significance of the cluster impacts expressed by individual criteria. Based on the assessment of the individual score evaluations, the division into particular evaluation mark levels A, B, C, D and E has been drawn up as follows:

Level of score evaluation	Minimum of points	Maximum of points
Level A	>-35	-0
Level B	>-75	-35
Level C	>-120	-75
Level D	>-160	-120
Level E	-200	-160

Table 43.87 – Cluster evaluation levels in Pillar 2

Level of evaluation mark A means a low risk of territorial / environmental non-discussibility etc., and level E means a high risk of territorial / environmental non-discussibility.

The territorial-environmental pillar has decisive influence on the sequence of projects of identical transport and economic significance.

Evaluation of results of Pillar 3 - economic

The individual evaluation mark levels within Pillar 3 have been constructed on the basis of the following assumptions.

The cluster, the economic efficiency of which is proved, achieves the minimum IEF equal to 1; if IEF is higher, the cluster is economically more efficient; if the value is lower, the cluster is not economically efficient. IEF equal to 0 and lower does not generate benefits anymore and it has only costs.

Division into individual levels of evaluation marks A, B, C, D and E is prepared as follows:

Level of score evaluation	IEF value
Level A	IEF > 1,5
Level B	0,85 < IEF <=1,5
Level C	0,4 < IEF <=0,85
Level D	0< IEF<=0,4
Level E	IEF <=0

Table 43.88 – Cluster evaluation levels in Pillar 3 according to IEF

As shown by the above-mentioned table, the level of evaluation mark A means high economic efficiency, level B means that the cluster is around the limit of the economic efficiency, level C is below the limit of efficiency, level D and E is deeply below the limit of economic efficiency.

IEF is determined on the basis of the outputs of the transport model that has been drawn up above all for the core transport network and core traffic relations in the CR territory. It has already been advised before that its inclusion in the evaluation of need of local measures such as intersections, railway junctions, by-passes and relocations of first-class roads of smaller extent are rather limited. The main reason is the fact that there are no differences between the respective “with a cluster” and “no cluster” options in costs of time and traffic performances; it means that no cluster benefits are noticed (these arise in particular in the network of local roads and through road through municipalities, which are not parts of the strategic transport model network). Concurrently, it means that the IEF indicator does not substitute a need of a detailed CBA which must be prepared within the scope of economic evaluation of concrete projects (feasibility study, project plans). It concerns only indication of possible risks in further preparation of a concrete measure.

With regard to the different methodological evaluation procedure, it is necessary to divide the final sequence of clusters into separate annexes for projects and suggestions of particular types of transport. Mutual comparison among individual lists and their comparison to projects subject to exceptions shall be a part of drawing up a schedule of realization within elaboration of Book 10.

Indicator IVI replaces IEF of the plans where IEF could not be calculated according to the methodology or where the calculation would not be relevant (e.g. due to lacking data).

The non-linearity in the division of bands of evaluation is determined by the need for sufficient mutual diversification of results. The objective of the non-linear division is thus the effort not to obtain a result that would finally cumulate a higher number of projects in one of the bands of evaluation and would worsen the visibility of differences between individual projects / plans.

Thresholds in individual pillars

In the situation where the evaluated measure gained in the 1st pillar evaluation mark of level D or worse, there is a need to come with a total re-evaluation of proposed measure and with evaluation of alternative possibilities addressing the demand. The same apply for measure gaining mark of level D or worse in the 3rd pillar. In such case the measure should not be pursued in up to new proposed parameters and the reduction of parameters should be agreed. Mark of level C in the 3rd pillar does not confirm the economic efficiency of the measure and it is possible that there would be a need to seek for savings. However the real economic efficiency can be higher due to induction of higher demand depending on the further related infrastructure and measures of organization or operational nature. Strategic CBA can also be too rough and some benefits can be concealed or underestimated. The last option is that the measure is really not viable and justifiable from the economic point of view. All this has to be verified in separated follow up processes. Similarly in the 2nd pillar the risk of difficulties in terms of the territorial and environmental negotiability needs to evaluate individually. More attention (including setting up the negotiability risk management) should be paid to measures gaining in this pillar mark of level C and worse.

Band of evaluation of the cluster

After determination of the level of evaluation marks, it is possible to determine the so called band of evaluation which primarily decides on the order of clusters.

Band of evaluation is determined as follows:

Based on the cluster evaluation in individual pillars (evaluation mark levels A-B-C-D-E) we can draw up mathematically, using their combination, in total 125 rating bands

Band 1corresponds to the transport and socially beneficial project, economically efficient without territorial and environmental risks – band 125 means a project not beneficial, economically inefficient with great territorial and environmental risks).

However, in practice not all project combinations are achieved in the project evaluation and from the point of view of material content of individual pillars we can reveal illogical combinations – with grey background in the table. For instance, band 81 where the traffic and social pillar achieved only mark E, however, economic efficiency is at the highest level of mark A. Practically, there are not achieved all combinations in the evaluation of clusters.

In the first evaluation degree, the clusters are evaluated above all according to results in Pillar 1 - transport-social and in Pillar 3 - economic. The sequence of bands is drawn up using the weights determined by the experts. In the second evaluation degree, the aspect of Pillar 2 - environmental is added, which means the environmental pillar has decisive influence on the sequence of projects of identical transport and economic significance. These two pillars are fundamental from the viewpoint of satisfaction of needs of users of transport for whom the transport infrastructure is primarily developed. By setting the weights, the expert group confirmed that the main objective is to select measures necessary for the whole society and economically efficient, not to select primarily the measures that will be the least complicated as regards their territorial-environmental risks. Also the second pillar is very important, of course, for it is not possible to develop transport infrastructure at the expense of territorial possibility and at the expense of the environment - for the purpose of elimination of these influences, it is - however - necessary to primarily optimize a technical solution, not to entirely give up implementation of a measure solving a key need.

Evaluation at particular levels A, B, C, D, E, shows the fulfilment rate of individual criteria. Evaluation at levels C, D thus means that the cluster of measures does not fulfil some criteria; therefore it has gained fewer points. However, this does not a priori mean that because of level C, D, E it should be moved lower. Therefore also the clusters with worse evaluation in some of the clusters are placed in the front zones. A significant role here is played by the weight of the pillar determined by the experts. In case of such clusters, it is necessary to solve the essence of the problem (to change routing in sensitive areas, rationalize the design parameters, to have a look at the investment costs and benefits in case of an economic problem, etc.). Such project may be recommended to be reworked and at the same time, it may stay a priority for the future.

<u>Band of evaluation is primarily determined by the order of clusters.</u> In case that the cluster is situated in the same band of evaluation, the weighted total of point levels decides.

In the following schema, there are shown necessary steps for determination of the order of the cluster.

The following Table Table 43.89 – Bands of evaluation results to determine the ranking of clusters contains all possible and theoretically achievable combinations of evaluation marks, which result in the band of evaluation of the specific cluster.

BAND	Pillar 1	Pillar 3	Pillar 2	BAND	Pillar 1	Pillar 3	Pillar 2	BAND	Pillar 1	Pillar 3	Pillar 2	BAND	Pillar 1	Pillar 3	Pillar 2	BAND	Pillar 1	Pillar 3	Pillar 2
1	A	A	A	26	A	D	A	51	B	D	A	76	C	D	A	100	D	D	A
2	A	A	B	27	A	D	B	52	B	D	B	77	C	D	B	102	D	D	B
3	A	A	C	28	A	D	C	53	B	D	C	78	C	D	C	103	D	D	C
4	A	A	D	29	A	D	D	54	B	D	D	79	C	D	D	104	D	D	D
5	A	A	E	30	A	D	E	55	B	D	E	80	C	D	E	105	D	D	E
6	A	B	A	31	C	A	A	56	D	A	A	81	E	A	A	106	E	C	A
7	A	B	B	32	C	A	B	57	D	A	B	82	E	A	B	107	E	C	B
8	A	B	C	33	C	A	C	58	D	A	C	83	E	A	C	108	E	C	C
9	A	B	D	34	C	A	D	59	D	A	D	84	E	A	D	109	E	C	D
10	A	B	E	35	C	A	E	60	D	A	E	85	E	A	E	110	E	C	E
11	B	A	A	36	B	C	A	61	C	C	A	86	D	C	A	111	D	E	A
12	B	A	B	37	B	C	B	62	C	C	B	87	D	C	B	112	D	E	B
13	B	A	C	38	B	C	C	63	C	C	C	88	D	C	C	113	D	E	C
14	B	A	D	39	B	C	D	64	C	C	D	89	D	C	D	114	D	E	D
15	B	A	E	40	B	C	E	65	C	C	E	90	D	C	E	115	D	E	E
16	A	C	A	41	A	E	A	66	B	E	A	91	C	E	A	116	E	D	A
17	A	C	B	42	A	E	B	67	B	E	B	92	C	E	B	117	E	D	B
18	A	C	C	43	A	E	C	68	B	E	C	93	C	E	C	118	E	D	C
19	A	C	D	44	A	E	D	69	B	E	D	94	C	E	D	119	E	D	D
20	A	C	E	45	A	E	E	70	B	E	E	95	C	E	E	120	E	D	E
21	B	B	A	46	C	B	A	71	D	B	A	96	E	B	A	121	E	E	A
22	B	B	B	47	C	B	B	72	D	B	B	97	E	B	B	122	E	E	B
23	B	B	C	48	C	B	C	73	D	B	C	98	E	B	C	123	E	E	C
24	B	B	D	49	C	B	D	74	D	B	D	99	E	B	D	124	E	E	D
25	B	B	E	50	C	B	E	75	D	B	E	100	E	B	E	125	E	E	E

Table 43.89 – Bands of evaluation results to determine the ranking of clusters

From the point of view of the subject content of individual pillars, we can identify **opposing combinations – they are highlighted in grey in Table 43**.89 – Bands of evaluation results to determine the ranking of clusters **.** For example band 81, where the transport and social pillar achieved only mark E, however the economic efficiency is at the highest level of mark A.

Therefore, in practice, all combinations in the evaluation of clusters have not been and logically cannot be achieved.

The methodology of multilevel multi-criteria analysis was primarily composed so that mutual prioritization of required measures could be compared and so it cannot concurrently serve for mutual comparison of variants that solve the same indicated need in a slightly different area.

Despite this fact NGOS and civic associations made it a condition that alternative routings shall be assessed using this methodology. The results of this assessment cannot however serve as a base for a decision to be taken on a specific routing of a given construction where the routing has not been territorially stabilized yet. The process of territorial stabilization is subjected to legal procedures that the Transport Sector Strategies cannot replace.

The results of mutual evaluation of routing alternatives under the measures that solve, from the national point of view, de facto identical need, showed very identical results within MMA.

Rethinking of measures based on the resulting mark in the assessment pillars

In case a measure assessed received mark D or worse in the 1st pillar, the proposed measure has to be rethought completely and the possibility of resolving the need in another way has to be considered. The same applies to measures that received mark D or worse in the 3rd assessment pillar. In such cases, the measure with its proposed parameters should be abandoned and the design parameters should be reduced. The risk of difficult territorial and environmental negotiability has to be assessed case by case in the 2nd assessment pillar. Measures that received mark C or worse in this pillar are worthy of special attention and negotiability risk management.

Evaluation of fulfilment of the system of criteria in individual pillars for individual clusters of measures (MCA and zCBA)

1. Pillar	2. Pillar	3. Pillar
Weighted point profit (min.0 - max.200)*	**Weighted point profit (min.-200 – max.0)***	**Weighted point profit (min.0 – max.200)**

* *Economic pillar acquires - according to methodology for the best cluster - a point profit of 200 points (the worst being 0 points). In the remaining two pillars, however, the point profit is given by an extent of fulfilment of individual criteria where no evaluated cluster achieves a maximum value, neither in the first nor in the second pillar. Thereby there is increased importance of the economic pillar.*

For the 1st and 2nd pillar it is necessary to use:

Recalculation coefficient of points for 1st and 2nd pillar - for removal of the increased importance of the economic pillar.

By multiplication, we get a point profit for determination of the level of evaluation mark.

1st pillar –Point profit	2nd pillar –Point profit	3rd pillar –Point profit
Positively directed	**Negatively directed**	**Positively directed**

Point scale 10-1 serves for even distribution of point profits of individual clusters identically in all 3 pillars (elimination of different direction of points).

Point level: 10 – high benefits and impacts of the cluster
1 – low benefits and impacts of the cluster

1st pillar – point level	2nd pillar – point level	3rd pillar – point level

Weights of

Weighted total of point levels
10 – best cluster according to VMH **1 –** worst cluster according to VMH

Level of evaluation mark is a basic output value for determination of the resulting order of clusters which characterizes the extent of importance, or efficiency of the cluster.

Level of evaluation mark
A 1. Pillar: high traffic and social importance,
2. Pillar: low risk of environmental non-discussibility
3. Pillar: high economic efficiency
E 1. Pillar: low traffic and social importance,
2. Pillar: high risk of environmental non-discussibility
3. Pillar: below the limit of economic efficiency

Weights of

Band of evaluation
1 - cluster beneficial to traffic and society, economically efficient, without environmental risks
125 - cluster not beneficial to traffic and society, economically inefficient, and with great environmental risks

Figure 43.20 – Methodology of the Multi-Level Multi-criteria Evaluation (MMA)

43.3 Exceptions from standard way of evaluation

- **Suggestions** (not assessable in the 3rd pillar – not quantifiable using the IEF, lack of information on outlook measures)
- **Strategically unmodelled clusters** – bypasses of small municipalities whose benefit cannot be represented in the strategic transport model

Suggestions with a potential have to be developed into projects so that they can be assessed properly along with the others during the next TSS2 update. The prioritisation of bypasses has been made separately in Book 6.

43.4 Alternative project options

- Parallel measures (within the meaning of leading a parallel route)
- Options of measures proposed by civil initiatives
- Consultant's suggestions from the bottlenecks analysis
- Rationalization of measures

Chapter 23 provides more information on the measure alternatives and methods and results of their assessment.

44 Final sequence of clusters

In the list of the resulting order of clusters (in Annexes) there is stated:

- description of the cluster - cluster number, description of the route being dealt with, designation whether it concerns a project (P), proposed project (N) or capacity optimized proposal (KON), variant cluster, numbers of projects or proposed projects from which the cluster is comprised of, passage through regions
- Point profit for determination of the level of evaluation mark for the 1st, 2nd and 3rd pillar
- Value IEF, or IVI
- Point level for the 1st, 2nd and 3rd pillar
- **Weighted total of point levels**
- Level of evaluation mark for the 1st, 2nd and 3rd pillar - green background colouring means the best evaluation, red background colouring the worst
- **Band of evaluation** - green background colouring means the best evaluation, red background colouring the worst
- Level of quality of transport for clusters of road infrastructure
- Under-contract constructions of clusters of road infrastructure
- Expectation of the nearest possible commencement

45 Software for evaluation of Pillar 1 and 2 MMA

As it has been already mentioned above, the software has been designed in MS Excel spreadsheet, while a separate file has been drawn up for each transport mode. Thus in total 4 files have been drawn up for evaluation of the designed set of criteria of Pillar 1 and 2:

- Road infrastructure
- Railway infrastructure
- Waterways
- Air transport infrastructure – with regard to the fact that only two projects were evaluated, and one of them was specific as regards system measures, the spreadsheet for determination of the final sequence has not been drawn up.

The file for evaluation of criteria of individual road infrastructure clusters consists of the following sheets

1) Projects
2) Suggestions
3) Clusters-input data
4) Pillar 1 Evaluation
5) Pillar 1 Calculation
6) Pillar 2 Evaluation
7) Pillar 2 Calculation
8) Total evaluation
9) Rating zone
10) Unquestionable
11) Not evaluable
12) Level of Service
13) Weights
14) Charts

Book 9 – Financial Options Ensuring the Transport Infrastructure Development

46 The issue of transport infrastructure financing

The outlook for available sources for financing transport infrastructure (hereafter as "TI") is one of the key factors for the effective planning of the development of TI. The future development of available sources depends, however, on a number of unknown, even political, decisions on the combination of the financing sources to be utilised, the weight of the various sources and, last but not least, the entire volume of resources intended to finance TI. An interactive TI financial sources simulator was developed for outlook of available TI financing sources for maintenance and development. This instrument enables to change the assumptions regarding the composition and amount of TI financing resources to reflect current developments. With the knowledge of required volume of TI financial sources, the simulator may also be used as a basis for deciding the optimal combination of available resources and measures for maximisation and stabilisation.

This simulator of funding sources has been composed in the MS Excel environment. It enables the user to make any setting of the input variables. The macroeconomic indicators affecting the amount of each funding sources in the following years can be set. The simulator output is the total amount of available funding resources based on the fund usability setting and their amounts as per the assumed trend.

47 Current TI financing system

The main weak points of the current financing system include an insufficient amount of sources for developing TI, the instability of the system, and difficulty in making medium-term and long-term predictions. Conversely, the strong points of the current system include the diversification of sources and the relative stability of certain sources.

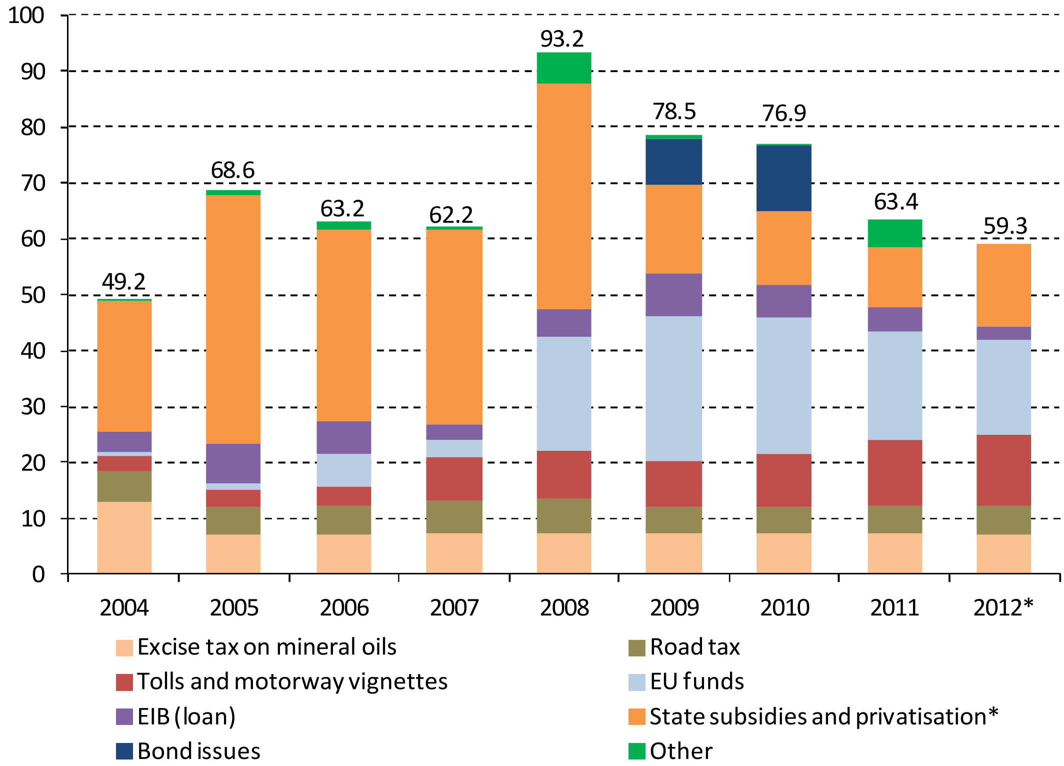
At this time, the main sources for financing the maintenance and development of TI[12] are as follows:

- Direct sources
  - Charges for the use of roads
    - Time-related charges (motorway vignettes)
    - Performance-related charges (road toll)
  - Charges for use of railway infrastructure
- Budgetary sources
  - Road tax
  - Share on mineral oil excise tax
  - Subsidy from the state budget
- Subsidies from the European Union

[12] Transport infrastructure is understood to be motorways, first-class roads, including dual carriageways, railways, and waterways.

- Debt sources
  - EIB loans
  - Bond issues

Volatility of total sources for financing TI and particular items during 2004 – 2011 is illustrated in the following graph.



Source: MoT, MFDI

* Where 2012 data was not available, SFTI budget is envisaged.

Figure 47.23 – Development of available sources for financing TI in 2004-2012 (CZK billions)

48 Parameters and usability of funding sources

This chapter provides more detailed information on each of the funding sources analysed, which can be modified parametrically in the funding source simulator and used both theoretically and practically in innovating the structure of the income side for transport infrastructure uses.

48.1 Excise tax on mineral oils

No major change in the total revenue from the excise tax on mineral oils is expected in the future. An increase in the excise tax rates would probably lead to a further reduction in fuel purchases. A potential reduction in the rate would be offset at least partly by a sales increase. Considerations of changing the excise duty rates have to reflect the setting of these rates in neighbouring countries as well as the total price of the fuel, including all the other price components.

Although there is a direct dependence between economic growth and road traffic performance, an adverse effect on the excise collection can be expected in the form of an increasing share of vehicles with better fuel economy and alternative fuels. Should this adverse effect prevail and the excise collection decrease significantly, consideration has to be taken to replenish the missing funds with a form of taxing alternative fuel vehicles. However, the situation in the neighbouring countries can be expected to be similar and it will have to be handled in connection with the developments in all the surrounding countries.

The current share of collected excise tax on mineral oils that goes directly into TI funding is 9.1%. The other revenues from the excise tax are not directly bound with uses towards TI development.

There have been repeated suggestions historically to increase the share of collected excise tax on mineral oils that is intended exclusively for TI funding. Ceteris paribus, this step would contribute to increasing the amount of funds for TI. If this share was increased considerably, the system might become partly or completely independent of the amount of direct subsidies from the stage budget.

48.2 Road tax

The road tax rules are defined by EU Directives; it is impossible under the current thinking to abolish the road tax completely and potentially replace it with another, more cost-effective form of fund collection. Entities subject to paying the tax and other requisites are defined by Act no. 16/1993 Coll. on the Road Tax, as amended.

There is a dependency on economic growth in the case of road tax collection. Nevertheless, this is also subject to the adverse effect of greening the fleet. It therefore seems advisable to modify the tax rates in a way that largely eliminates this revenue decrease effect while helping the continuing fleet greening.

48.3 Performance-based charging (toll)

It is of absolute necessity to immediately start work towards ensuring the functionality of the performance-based charging system at least within the existing scope of charging (D + R + approx. 200 km of 1st class roads) starting on 1 January 2017, which is the date of expiry of most of the contracts under the sum of contractual arrangements concluded with the current general provider of the toll system. There is a considerable risk even today (September 2013) of not completing all of the necessary work on time. There is a theoretical danger of a revenue blackout from performance-based charging from 1 January 2017 that would have a fatal impact on the TI funding in the CR (a hole in the revenue worth approx. CZK 9 billion a year).

48.3.1 Charging for use of 1st class roads

An extension of the toll collection system to 1st class roads has been a concept considered for a long time. The earliest theoretical possible date for implementing this change is 1 January 2017, when the toll system contract for the next period should enter into force. The choice of the technology depends on specifying the extent of the future charged network. It is advisable to provide an interoperable system enabling adequate flexibility. This flexibility can be provided by several technical solutions (such as satellite technology). However, the preparation of the new system has to take into account the economic efficiency of the system operated at present (DRSC – microwave), which should be as usable as possible in the next period (e.g., a form of hybrid solution being tested).

It is not viable to implement performance-based charging for vehicles above 3.5 t on 1st class roads any earlier due to the huge time and technology intensity of the solution and the existing contract with the current general provider of the toll system.

Charging for the use of 1st class road might result in a major increase in the funds for transport infrastructure, but it would also impose an additional monetary burden on hauliers, which might lead to a further worsening of their economic standing with major impacts difficult to quantify. However, the benefit for stabilisation and better predictability of the available funds would be indisputable.

Another objective of developing a new contract on the toll system operation is to reduce the relative costs of operating it, which will result in another increase in the net income from the performance-based charging. The costs of the toll system operation were over 32% of the toll revenue (almost 39% including the investment costs). The terms and conditions of the new contract should make sure this proportion does not exceed 25%. The Transport Policy of the CR itself sets the maximum threshold for the costs at 30%.

In the event of charging covering 2nd class roads as well, the allocation mechanism for both the revenues and costs of the toll system operation among the respective road managers would have to be set. Nevertheless, the net income from charging 2nd class roads would be zero at best based on current estimates, which forces the Ministry of Transport into other considerations that would reduce the use of 2nd and 3rd class roads, e.g., by a legal provision in the Roads Act or an increase in the frequency of traffic restrictions using traffic signs.

The limiting factor for expanding the toll system, as well as increasing the toll fee rates, is the EU rules, which define the amount of the funding gap in relation to the EU funds, meaning the amount of potential subsidy for specific projects.

48.3.2 Local differentiation of toll rates

The toll rates are set in a blanket manner at present, with only a differentiation by the road type (different rates for D+R and other 1st class roads). Local toll rate differentiation makes it possible to reflect the different investment and operating costs of the different sections of the charged roads. It can also be used as a tool for keeping trunk traffic on roads intended for it.

What is more, local differentiation of the toll rates might be a way to eliminate the risk of reduction in the size of EU subsidies provided or returning of subsidies already invested resulting from the EU rules.

This measure does not represent a major benefit for stabilisation of TI funding sources, but may have a positive effect on their total.

48.3.3 Time differentiation of toll rates

Different rates of toll for various times of the week can also be defined to control the traffic volume and ensure traffic fluency on roads. There is currently a higher toll rate for Friday afternoons. A consideration may also be given to replacing the Sunday ban on truck traffic with a major increase in the rates for Sunday afternoons. This measure might have a positive impact on the total amount of funds, but it does not resolve the risk of reduced project co-funding by the EU.

48.3.4 Replacement of time-based charging for vehicles up to 3.5 tonnes with performance-based charging

Another possible measure is to replace the time-based charging for vehicles up to 3.5 tonnes with performance-based charging. The pro of performance-based charging is its greater justness for users, with those who use the motorway/road infrastructure more paying more. On the other hand, the costs of performance-based charging are much higher than those of time-based charging. Moreover, revenues from time-based charging, unlike those from performance-based charging, do not enter the funding gap calculation under the current EU rules. Including vehicles up to 3.5 tonnes in the toll system under the current blanket toll collection system would have the same effect as increasing the toll rates and might lead to a reduction in the EU subsidies or having to return subsidies already provided. This can be partly avoided by introducing local toll differentiation as part of a flexible rate system in line with the EU Directive.

As with expanding the toll system to 1st class roads, 2017 is the earliest possible date for the technical change. On the other hand, postponing this change further makes sense in terms of maximising the drawing of EU funds under the current rules.

As concerns the method of collection and inspection of the time-based charge payment, alternative methods can be considered based on experience in neighbouring countries that permit increasing the efficiency and reducing the costs.

48.4 Stabilisation of subsidy from the state budget

One of the main sources of instability and low predictability of the available amount of funds for TI is the current system of allocation of subsidies from the state budget on an annual basis, while not fulfilling budgetary outlooks, and irrelevantly set budgetary outlooks. This approach results in a high degree of inefficiency in the sector, since the long-term nature of both transport infrastructure investment planning and implementation needs to be covered by the budget throughout. Failing that, the construction times drag on or projects even get mothballed, which ultimately makes them more expensive.

To be able to better predict the amount of state subsidies in the coming years, thus make the TI development planning more efficient, it may be advisable, for instance, to tie the amount of state subsidy (except purpose-bound subsidies) to a relatively stable variable. The GDP appears to be a suitable candidate, as the amount of state finance is closely linked to it. Setting a certain percentage of the GDP that will go into the TI (SFTI) from the state budget every year in the form of state subsidies would provide all the stakeholders with a reliable base for planning at least in the medium term. This approach need not necessarily increase the total amount of resources for TI: it is primarily a potential stabilisation measure.

48.5 Maximum utilisation of EU resources

It is a primary priority of both the Ministry of Transport and the Government of the Czech Republic to make maximum possible use of the EU funds. Some of the measures for achieving a full drawing of the OPT (as well as the funds for 2014-2020) and elimination of the risk of having to return subsidies already received have been mentioned above. They include an increase in toll collection with respect to the EU rules in order to determine the funding gap and local toll rate differentiation (see 3.6 for more).

48.5.1 Determination of national co-funding sources

A precondition for maximising the use of resources allocated from the EU funds is to provide adequate resources for national-level co-funding. This precondition would not be met if the current mix of TI funding resources as contained in the SFTI budgetary outlook. Meeting it would require either increasing the subsidies from the state budget or a major reduction to the maintenance and repairs of the existing TI, which is no longer permissible given its undermaintained state.

It is necessary to ensure project readiness for implementation for a smooth start of resource drawing under the new funding framework starting in 2014 or 2015. The preparation of these projects calls for more national-level resources.

48.5.2 Active negotiation of conditions for the programming period 2014-2020

The urgent task for the next programming period 2014-2020 is active negotiation of funds allocated for the Czech Republic and projects involving the CR's territory.

Specific terms and conditions of the Multiple-year funding framework 2014-2020 remain to be finally approved. No agreement has yet been reached concerning the total amount of resources allocated for the Cohesion Fund, including the Czech Republic. The present paper is therefore based on the form of papers negotiated in November 2012 and a conservative estimate of resources allocated for the CR as of January 2013 with respect to the trend in the following months as closely as possible. The most current information is included in the design for the Proposed Funding Alternative in Book 10 of this summary paper.

Transport remains an EU priority. More emphasis will be put on completion of the core TEN-T network. The Connecting Europe Facility (CEF) fund will be set up, a joint tool for funding of Trans-European Networks, including energy, telecommunications and transport infrastructure.

48.5.3 Efficient use of EU funds

A precondition for the efficient use of resources allocated for the next programming period 2014-2020 will be to define clear national priorities, simplify the rules for drawing the funds and setting of functioning control and review mechanisms. These goals are pursued by the Partnership Agreement for the programming period 2014-2020.

Operational Programme Transport is one of the eight proposed operational programmes for 2014-2020. The programme priorities will be: completion of the large TEN-T infrastructure and key transport infrastructure of national importance outside the TEN-T; more intensive orientation on maximum exploitation of intelligent solutions for traffic control, telematics, logistics, etc., including the Galileo services; support to more strategic focus of transport construction projects on key infrastructures in the CR; prioritisation of construction projects by their economic importance and evaluation of effectiveness of each project.

48.5.4 EU funds after 2020

No reliance on subsidies from EU funds is possible for the period after 2021, or 2023 reflecting the n+2 rule. The amount of EU funds is unpredictable for that period; moreover, the CR's GDP can be expected to come closer to the average EU GDP, leading at least to a perceptible reduction in resources allocated. However, it is of utmost importance that the CR exerts pressure on the potential for maximising the available EU resources for the next period as well.

48.5.5 Charge for railway infrastructure use

This charge is set by the RIA in its so-called Declaration on Railways pursuant to legal regulations in force. The revenue from this charge is the RIA's direct income and helps decrease its demand for funding to traffic control and operability from the other sources analysed in detail in TSS2. Since this charge does not enter the SFTI budgetary balance, it is not part of the resource balance considered in Book 10.

49 Maximisation, stabilisation, and better predictability of TI financing sources

Book 9 identifies all potential sources utilizable for the financing of transport infrastructure. There is elaborated a potential of individual - in future theoretically available - sources. The basic output of Book 9 is a requirement for stabilization of the source side of the transport sector. **Book 9 does not foresee any necessary political decisions on selection of an appropriate combination of these sources which will lead to necessary stabilization of the sources. Only a stable - or annually explicitly predictable and within the sector partially influence able - volume of sources will enable implementation of the conceptual approach to secure transport infrastructure.** On the basis of results of previous Books, it is provable that transport infrastructure as a compact system must be constantly perceived as a public service which cannot do without considerable participation of the sources of public budgets even in case that increase of the role of direct charging of users will be gradually strengthened. Construction and maintenance of transport infrastructure must be definitely seen as public interest. This idea is already included in the Transport Policy of the CR 2014 – 2020 from which principles the Transport Strategies arise.

The basic output of Book 9 is a simulator of sources of the financing of transport infrastructure which enables to parametrically work with individual sources and their development in time. Contemplated measures in income that will lead to a change in TI financing sources are as follows:

- Increasing the SFTI share on mineral oil excise tax,
- Road tax collection and benefit optimisation,
- Expanding the road toll system to include first-class roads,
- Introduction of performance-related tolls for vehicles up to 3.5 tonnes,
- Maximum utilisation of EU funds,
- Toll differentiation,
- Streamlining the institutional setup of the Transport Ministry,
- Stabilisation of appropriations from the national budget,
- Facilitation of utilisation of debt financing
- PPP projects

A condition for using the potential of individual sources is their provable social advantageousness which must be individually verified in detail before implementation. Thus, it is not possible for instance to extend the system of direct charging if costs of its collection are too high (Transport Policy of the CR 2014 – 2020 admits in this respect a maximum proportion between incomes and expenses in the amount of 30%).

50 Simulation of available TI financing resources

50.1 Available TI financing resources simulator

For the purposes of simulating available TI financing sources, working on assumptions provided / inputs that are influence able as well as non-influence able within the sector (macroeconomic prediction, nation-wide development), an interactive instrument – a TI financial sources simulator – was developed as part of the project. With the help of this instrument, it is possible to analyse the influence of various combinations of contemplated measures for the maximisation, stabilisation and better predictability of TI financing sources with an outlook towards 2040.

50.2 Variants of financial sources combinations and amounts

Four variants of possible combinations and amounts of financial sources were developed under TSS2:

- **Restrictive** (national sources insufficient, no co-financing from EU sources, debt financing not used, none systemic changes, increasing the budget for repairs and maintenance works impossible, nearly zero development of new TI, the internal debt of TI deepened)
- **Minimalistic** (minor systemic changes, national sources have enabled slight increases in sources for repairs and maintenance which, however, are still lower than required, co-financing from EU secured at the cost of drawing a debt to be subsequently paid off from the sector's own resources – a considerable slump in investments in the period after OPD II termination at the time when the debt is being paid off, i.e. after 2023)
- **Development I** (national sources sufficient for gradual increases in the budget for repair and maintenance and co-financing from EU sources, more significant systemic changes on the resource side, debt financing utilized – a faster onset of new investments at the cost of indebtedness, a considerable slump in investments at the time when the debt is being paid off)
- **Development II** (the share of national sources even higher than in Development I, i.e. different systemic measures on the source side, other parameters identical with Development I).

All the variants, except for Restrictive, predicted a political decision about specific systemic changes and their possible combinations, incl. the significant role played by deployed debt financing to be paid off from the sector's own resources. The variants are described in detail in the full version of Book 9.

Different total amount of the budget was achieved by mutually combining individual measures on the source side. The drawing of debt sources served (except for the Restrictive variant) to even the budget up to the required amount of the total volume of sources. However, the repaying of debt financing in respective years resulted in a significant slump in sources available for TI. The remaining part of the total amount of sources is used for instalments.

51 Debt financing repaid from the sector's own sources

As it has already been mentioned, the proposed variants of financing that would secure a generally higher volume of financial sources for investments, especially in the mid-term horizon, i.e. in the period 2014 – 2023, but at the cost of drawing a credit to be paid off from the transport sector's own sources.

However, it is very expensive to use a credit in a long-term horizon and it would decrease new available aggregate sources for new investments at the time when the debt is paid off – the major part of instalments after 2023, when the instalments would further, after the end of EU 2014 – 2020, deepen the lack of sources available for investments.

The primary task of Transport Sector Strategies is to ensure that the needs of the highest priority, as identified under the TSS2 project, are met. After needs had been evaluated and projects found to meet them, it was however established that the projects are not in such a stage of preparedness that would enable them to be implemented in 2014 – 2020. As a result of utilization of the potential of debt financing to be paid off from the sector's own sources at this period less urgent needs would be met and project which are less beneficial for the whole society would be implemented. Then, there would be a future risk that projects dealing with the fundamental needs would not have sources secured at the time when they are ready to be implemented unless participation of public budgets is increased.

Therefore, **a conclusion was adopted that debt financing to be paid off from the sector's own sources should be allowed only in the following two cases:**

- There are not enough national sources to co-finance EU sources
- A measure will be prepared to be implemented to solve fundamental society-wide needs[13] and no sources other than the debt sources will be available for their implementation

52 Planning of available sources of financing of DI in the Proposal variant of Funding

With the use of the Simulator of sources, the Ministry of Transport provided for the Proposal variant of funding which does not predict necessary political decisions and only indicates a necessary volume of national sources for the possibility of fulfilment of the main objectives of the Transport Strategy. **The proposal variant of funding does not make use of debt financing payable from the sector's own resources. The requirement for system changes not to be predicted was the main reason for creating the proposal variant**, which is in detail described in Book 10 or the following chapter of the summary document, as the case may be.

[13] Solely the measures that gained the band of evaluation 1-10.

Without timely adoption of stabilization measures requiring necessary legislative regulations through which there will be achieved a necessary volume in the amount of approx. 70 billion CZK/year (at fixed prices of the year 2012, see the graph in Table 4.4), it will not be possible to fully observe the schedule of implementation of Transport Sector Strategies given in annexes to this Book 10.

Only indicatively, there are proposed in the proposal variant of funding solutions to possible legislative measures arising from proposals contained in Book 9 which would lead to stabilization of sources in the said amount.

53 Multiplication effects of TI construction[14]

The development of TI Leeds to be seen not only as an expense item but also as source item as TI is, due to its demonstrable multiplication effect, an instrument for a strengthening the economic growth and an increase the competitiveness. According ČSU data respective multiplier of TI construction is express in production unit concerned and oscillate for building industry on level 2,2 – 2,3..

Transport infrastructure extending generates a number of socio-economic effects, apart from the one-time impact of increases in investments (or rather government expenses) on GDP. The main TI benefits can be divided to direct and indirect ones.

Directs benefits include:

- Time savings,
- Energy (fuel) savings,
- Decreased wear of vehicles,
- Decreased accident rate.

Indirect benefits include:

- Taxes paid by companies and employees
- Increased job opportunities,
- Improved environmental conditions,
- The value of a territory increased by creating commercial and industrial zones,
- Increased economic strength of municipalities due to improved transport accessibility,
- Improved accessibility of a territory for tourists,
- Boost of construction activities related to the construction of transport infrastructure and its subsequent servicing.

While agreement will be more or less achieved as regards the listed benefits of TI extending, various opinions exist as regards impacts on GDP. A number of studies, international above all, were drawn up in the past, which however draw differing conclusions.

The production activities of the building industry have a number of links to other sectors such as producers of building materials and products, suppliers of energies, transport services, other services, architectonic and designing activities, IT technologies, etc. Depending on the scope of these links, i.e. the specific demand and also extent of in-house cooperation, a significant multiplication

[14] Only a part of the text is from Book 9, the other sections have been added under the cross-departmental consultation proceedings on the basis of submitted fundamental comments..

effect is achieved within the constructional production. The qualification of multiplier is based on the data from the National Accounts of ČSÚ. The respective multiplier is expressed in relation to the unit of the concerned production, ranging at the level of 2.2-2.3 for the construction sector in the long run.

Building sector, as the only industry in the Czech Republic, has already been in recession for the fifth year because, as alike the previous years, 2013 is yet another year of decline as well. Despite the need for fiscal consolidation, which is a condition for future economy development, it is a considerable problem to combine the length and depth of this process that, due to the high multipliers of this industry, retroactively impedes the objectives of the Czech economy consolidation themselves.

Instead of fulfilling one of the basic macroeconomic functions of the state, i.e. the stabilizing function, considerable destabilization occurred in the past period due to the expansion of investments in the boom period and significant cuts at the time of economic slowdown. From the point of view of the state and the need to construct the missing infrastructure, it is beneficial to compete and implement major contracts at the times when the construction industry goes through significant slumps and has free capacities; prices are significantly lower than at the time of economic boom thanks to the excess of supply over demand.

State is the irreplaceable and dominant investor in certain segments. It should play its role in securing smooth transitions between individual phases of the economic cycle that are a common phenomenon. Taking into account the economic significance of the construction sector, its investment concept should be developed as anti-cyclic rather than pro-cyclic.

In 2018, the Association of Building Entrepreneurs calculated the benefits generated from CZK 1 billion of construction investments for the state budget, proving that CZK 420 million, including savings of the costs of unemployment benefits and social and health insurance contributions, go to the state budget in the form of corporate and personal income taxes, VAT, payroll tax, and social and health insurance.

54 A higher degree of national financing resources

As it was already mentioned in chapter 51, satisfaction of the most acute transport needs on the territory of the Czech Republic is not just a matter of the absolute amount of sources available because many measures meeting the key needs have not been ready to be implemented yet (see next chapters).

Taking into account the provable multiplication effects of TI construction, a political decision to allocate a significantly higher amount of national sources than is the amount presumed in the proposal variant of funding, cannot be excluded. In relation to the discussions considering Transport Sector Strategies as held within the cross-departmental comment procedure, the following chapters of this Summary Document refer to this option, too. Projects recommended for implementation if the amount of national sources is higher than expected in the proposal variant of funding are stated herein by priorities. Attention is also drawn to related risks – especially the need to stabilize such an increase in a long-term horizon.

55 PPP projects

PPP projects and a suitable method of their implementation in the environment of the Czech Republic were analysed in detail as a part of work on Book 9 where the principles for suitable implementation are summarized. PPP projects were studied separately in Report 9.2. The DBFO (Design, Build, Finance & Operate) model with the payment mechanism based on payments for availability (the risk of demand is not offloaded on concessioners) was recommended as the most suitable for the environment of the Czech Republic. It is a model of external financing on the project level where suppliers (concessioners) bear significant risks. It is not only a different form of financing but also an alternative model of public procurement. Infrastructure securing is procured on the basis of a long-term contract and significant project risks are transferred to private suppliers.

The costs of this form of financing are higher (because of higher risks on the side of suppliers) but creates a higher pressure on long-term efficiency of investments and the total costs of securing a project in appropriate cases may thus be lower than in the case of the form of financing at the government level.

When risks are appropriately distributed between the government and concessionaires, assets of a PPP project can be recorded outside the government's debt/deficit balance according to ESA 95 or ESA 2010 rules.

PPP projects are recommended to be applied in the case of coherent investment units. The precondition for any considerations of a specific project to be financed in the form of PPP is a very good preparedness for investments. There is no point in procuring a project in the form of PPP before a legally effective planning permit has been issued for the whole segment.

Although the proposal variant of financing does not take over decisions on a specific segment to be implemented in the PPP form, it may not be excluded that it will be appropriate to be implemented in relation to necessary political decisions. At the same time, there are suitable segments of the network that are not covered by the sources according to the proposal variant of financing and where a PPP project could be appropriately implemented.

Book 10 – Implementation of Transport Sector Strategies

56 Managerial Summary

Book 10 of the document TSS2 summarizes results of hitherto works in previous parts. This summary is primarily carried out by the Consultant of the documentation in Report Z.10.1. Apart from that, Book 10 is - in accordance with specification - prepared within the scope of incorporation of feedback of the Contracting Authority (in the primary version, the subject-matter of Report Z.10.2). In Book 10, both these approaches are thus summarized into one unit.

In Book 10, there are summarized basic objectives and principles of the whole process which lead to own results. From these objectives and principles follows another procedure both in the methodical area, and in the area of formulating particular outputs in the form of a proposal for the securing of a functional system of transport infrastructure, inclusive of preparation and implementation of new development measures to transport infrastructure.

An independent chapter is comprised of a summary of input data both from the area of needs (requirements) for mandatory, development and grant expenditures, and on the other side a summary of necessary and available sources for the funding of transport infrastructure including conditions for the their use (particularly in case of EU funds).

An important part consists of principles of creation of a strategy. From these principles subsequently follows own construction of a preparation and implementation plan for development measures.

In relation to the plan of implementation of Transport Strategies, there are also mapped supporting activities connected therewith, which is, particularly, an institutional analysis, a proposal of monitoring and of regular evaluation of performance of a strategic plan, not only from the viewpoint of performance of the plan of construction, but mainly continuous performance of the plan of project and investment preparation of measures which are to be implemented in the future. There are also contained recommendations with respect to the update of the transport model. In relation to this part, there are also mapped risks of implementation of objectives of the strategy.

In Book 10, there is also provided a detailed financial plan with a breakdown for individual years, both for the source side, and for the expenditure side.

Global objective of the strategy is creation of a flexible planning and institutional framework for development of transport infrastructure with regard to necessity of preparation of OPD for the period of 2014 – 2020. Conclusions of the strategy in Book 10 follow from formerly prepared Books 1 to 9 with real evaluation of a possibility of implementation of principles of Transport Sector Strategies within the context of the current situation in the Ministry of Transport and current outlook of a macroeconomic situation which necessarily influences the medium-term horizon of the years 2014 – 2020.

Proposal of the strategy is based on a balanced assessment of sources and real needs in individual time horizons for individual packages of projects and transport modes. Proposal of preparation and implementation of individual measures is carried out with regard to stipulated objectives and needs of transport infrastructure, from which follows quantification of necessary financial sources in individual time horizons. **Proposal variant of funding,** described in chapter 58.3, reflects the current macroeconomic situation and its long-term outlook, which means in practice that there is not calculated such a high volume of finance by which implementation of all indicated needs would be covered - it particularly relates to a considerable lack of funding of Class I roads outside of TEN-T network and a lack of funding more intensive development of a railway network in the form of FC/HST in the long run. Amount of financial sources is determined in such an extent that it will be possible to meet the main objectives of the Transport Strategies. Degree of a detail of creation of the strategy in individual horizons is adapted to relative accuracy of financial sources and needs of preparation and implementation of projects.

In the medium-term horizon until 2020, the strategy with regard to time necessary for preparation is prepared at the level of individual projects. This approach is also necessary for preparation of a new operational program OPD II. In this period, need of financial resources for individual packages of measures and balance of modes is influenced by expected resources for co-funding from EU sources and by necessity not to further worsen the state of transport infrastructure. Expected volumes of necessary resources are relatively accurate.

For fulfilment of objectives of the Transport Strategies, there must be in the budget of the Ministry of T**ransport corresponding financial sources in the stable amount at least at the level of the Proposal variant of funding.**

It is necessary to view development of transport infrastructure not only as a cost item, but also as a source item, for construction of transport infrastructure is - with regard to provable [15] multiplication effects based on a production function - a **tool for the strengthening of economic growth and increase of competitiveness.**

Long-term horizon until 2035 is a key horizon for forming principles of the future strategy, and thus directing of financial resources to project and investment preparation of individual measures. Degree of a detail is determined by the level of clusters (transport routes). There is accented a necessity to improve the state of transport infrastructure (allocation of resources for repairs and maintenance), and continuation of development of the TEN-T network. Further development of infrastructure depends on available financial sources which are difficult to predict at present. A key role is played by assessment of a need and economic efficiency of construction of investment-demanding railway constructions, particularly, parts of fast connections / high-speed railway lines.

[15] ČSÚ: Respective multiplier is expresses in relation to a unit of the given production and with respect to the building sector it has ranged from 2,2 to 2,3 for a long period.

Balance between individual packages and modes is based, in principle, on expected transport performances with regard to priorities declared in Book 5 - preference of modes friendly to the environment, particularly, railway transport (majority of use of resources from CEF for railway constructions).

In the long-term perspective until 2050, needs defined in Books 6 and 7 are assessed in terms of volume on the basis of available information about financial demandingness. Possibility of implementation of projects defined in the said Books depends on real financial sources which may be estimated currently only with a very limited degree of accuracy. However, the strategy may be currently formed only on the basis of presently available and known data. According to very optimistic estimates of available resources (less probable) it is evident that it will not be possible to implement all identified measures in the expected extent, or the date of implementation thereof will be postponed beyond the time horizon of the strategy. As a rational approach is then defining real needs, or rather a definition of more realistic strategic objectives.

This state accents a necessity of monitoring the strategy and a need of continuous or regular update of the strategy, including management of development in the Ministry of Transport according to its principles. Also institutional measures must comply therewith which will include clear definition of powers and responsibilities of individual entities.

57 Principles of creation of the strategy

57.1 Basic principles and objectives of the process

Transport Strategies represent a strategic framework which is to help to effectively control procurement of sustainability and further development of transport infrastructure of the Czech Republic within the context of the European Union. Transport Strategies present a clear vision of future priorities and determine particular and objective investment objectives. Transport strategies are a continual process from which the planning of an approach to transport infrastructure in the possession of the state will continue to proceed, and which will be further updated and reviewed according to actual performance and utilized in the long term.

The global objective of the Transport Strategies is to produce a flexible planning tool for sustainable development of the transport infrastructure.

For the purpose of achievement of this objective, there were clearly determined several Transversal priorities and related specific objectives, and it was proceeded from the basic principle that development of transport infrastructure must correspond with development of the transport demand for individual types of transport in time horizons and preparation of their implementation must proceed from real needs. By achievement of the global objective, the process of Transport Strategies just commenced, its purpose will be to achieve the following objectives:

Objectives of implementation of the process of Transport Strategies:

- securing stable, annually predictable, and - from the level of the Ministry of Transport - influence able financial source side for a possibility of fulfilment of objectives of Transport Strategies **(need for financial** resource**)**
- securing maintenance, repairs and reconstructions leading to improvement of the state of transport networks **(need of infrastructure)**
- achievement of a functionally logical superior network of secure infrastructure with minimal environmental influences complying in the maximum possible extent - given by available financial resources- with the requirements of a transport demand in 2050 **(need of transport)**
- defining preferred packages / clusters / projects / suggestions / development of transport infrastructure in individual time horizons **(need of development)**

In the concrete level, the Transport Strategies determine:

- concrete priorities of development of transport infrastructure in the Czech Republic in accordance with priorities of the European and Czech transport policy and other important related documents, as well as with obligations arising from membership of the CR in the EU and priorities of relevant international treaties
- priorities of important projects of international, national-wide and supra regional importance according to their socioeconomic effect and urgency
- proposal of a strategy of the securing of funding arising from indicated, theoretically available financial sources
- balanced financial allocation to concrete priorities / packages / projects / suggestions within the scope of a financial plan
- framework plan of implementation of measures and clusters of measures according to their level of priority and bindingness of their implementation
- framework for implementation, monitoring and continuous evaluation of the plan
- measures for the overall system of continuous planning and funding of transport infrastructure at the national level of the state on the basis of the results of traffic model in individual time horizon and the public transport plans at the national and regional level.

Transport Strategies must contribute to the performance of the Strategy Europe 2020, National program of reforms, Strategy of Regional development, in support of sustainable growth and must contribute to the performance of objectives contained in the current White Paper on the European Transport Policy[16] and to the revision of the TEN-T policy. First of all, it concerns an obligation of the **Czech Republic** towards the European Union to complete the core TEN-T network by the year 2030 and comprehensive TEN-T network by the year 2050.

Transport Strategies also correspond with an emphasis which the Transport Policy of the Czech Republic for the period of 2014 - 2020 puts on creation of conditions for competitiveness of the CR and cohesion of regions. Measures "*To modernize transport infrastructure*", "*To plan development of transport infrastructure with regard to needs of the industry and tourism*" and "*To plan development of ITS systems*" will contribute to this objective. The Transport Sector Strategies also meet the objectives of the Regional Development Strategies of CR 2014-2020, approved by Government Decree No. 344 of 15 May 2013. They contribute to enhancing the competitiveness in peripheral areas, putting emphasis on territorial cohesion.

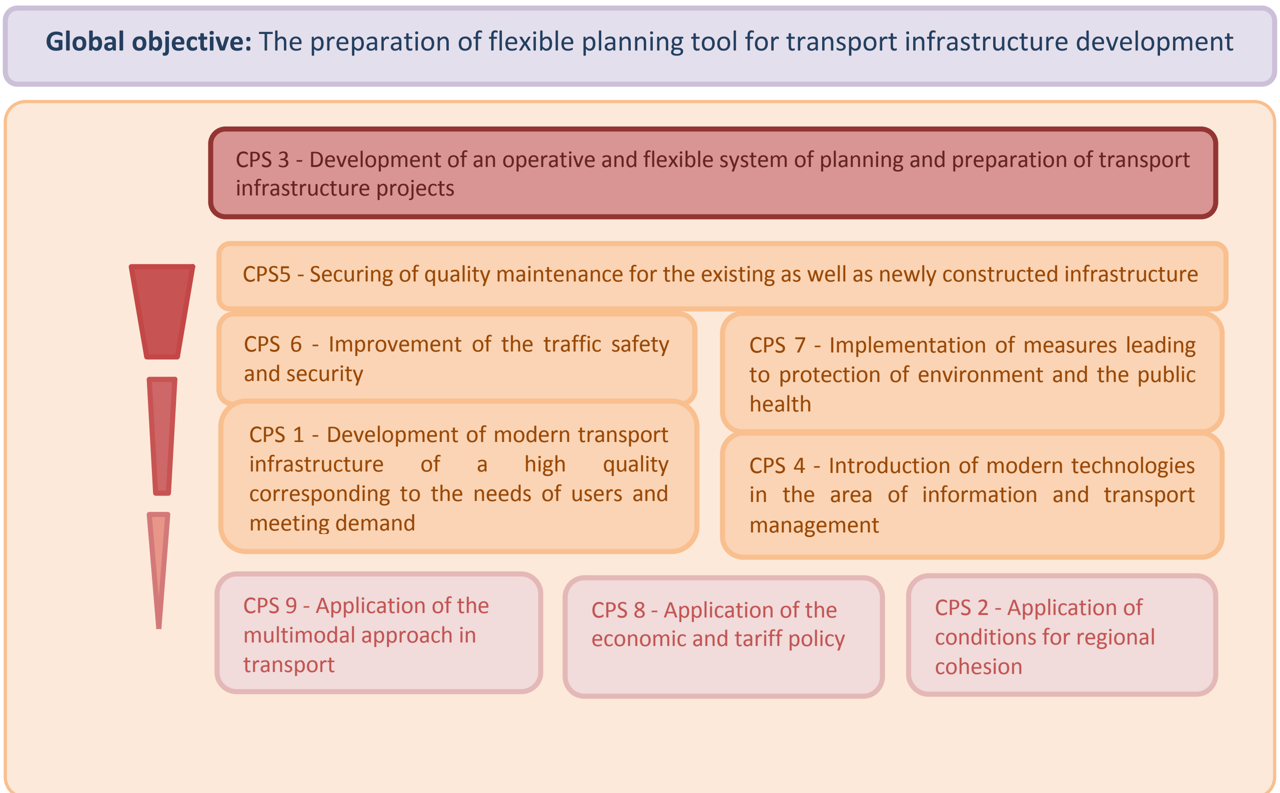
[16] White Paper: Plan of the single European Transport Area - creation of a competitive transport system effectively making use of the sources

The **basic principles of development of the Transport Strategies** are defined in the form of three horizontal key levels which are followed during all the subsequent steps in the draft development process:

- The principle of observing the needs of maintenance and infrastructure development
- The principle of proceeding from an available sources of funding and their allocation
- The principle of suggestion the real time horizons of Strategy implementation

Global objective "Producing a flexible planning tool of transport infrastructure development" will be accomplished - in applying a multimodal approach, harmonizing conditions of a transport market and increasing cohesion of regions - via implementation of measures corresponding with transversal priorities in the following order:

- Securing quality maintenance
- Increase of safety in transport and reduction of negative impacts of transport on the environment (e.g. through introduction of modern technologies of traffic management)
- Removal of bottleneck and missing connections via modernization of the existing and building of new transport infrastructure



The measures implemented under individual transversal priorities have the following specific objectives:

Specific objectives

Road transport

SC1	The road network dimensioned with respect to real needs of users
SC2	Connection to the European transport infrastructure
SC3	The capacity backbone network of roads with the character of expressways
SC4	A high-quality network of 1st class roads with a sufficient capacity securing interconnection of individual regions and their connecting to highways and expressways
SC5	Optimal technical condition of the existing as well as the new road network
SC6	Safe road network with the minimal impacts on the environment
SC7	The possibility to regulate road traffic and secure a part of financial means for maintenance and development of the infrastructure directly from its users
SC8	Improvement of urban mobility

Rail transport

SC1	Modernization and development of the railway infrastructure
SC2	Securing of substantiated needs in the orders placed by regions and support to suburban transport
SC3	Securing of a sufficient capacity and parameters for freight transport in the space and time
SC4	Securing operability of the railway infrastructure
SC5	Optimization of the railway infrastructure costs
SC6	Responsible planning of the transport infrastructure

Water transport

SC1	An increase in reliability of navigational conditions
SC2	Prolongation of the network of waterways
SC3	Increase in the efficiency of waterway transport by allowing for navigation of higher parameters vessels
SC4	Efficient port and service infrastructure
SC5	Elimination of down times in navigation
SC6	More extensive utilization of waterways
SC7	Increasing transport safety

Intelligent transport system

SC1	Improvement of the transport situation on roads, in urban agglomerations and in public transport
SC2	Increasing the mobility of persons and goods
SC3	Improving interoperability of the transport-carriage chain
SC4	Increasing safety of operations in the transport system

Air transport

SC1	A network of airports with optimal dimensioning
SC2	Good accessibility of airports by means of other transport modes
SC3	Securing sufficient capacity and safety of the air space

Multimodal transport

SC1	Development of freight multimodal transport
SC2	Development of passenger multimodal transport

Within the framework of Transport Strategies, the most important priority is to secure a **need of sustainability of the current infrastructure** by adjusting a reliable and financially sufficiently covered system of maintenance and renewal of infrastructure so that it is not necessary to deal with it after long-term neglecting by means of investment projects (rectification of the current state). Further, it is necessary to secure **a need of transport** with respect to transport infrastructure - its necessary equipment for the securing and management of transport and for protection of the environment. In case of railway transport, the need of transport on the network is, moreover, closely interrelated with the extent of the operation of a public (subsidized) service of passenger railway transport. Where the existing transport infrastructure does not comply with a demand for transport or a need to increase quality of the environment, there begins a **need of development**, the infrastructure must be built up on the basis of needs of its users under the condition of provable economic effect of the proposed investment. Further, it is necessary to interconnect individual systems and make use of their specifics in order to make the transport process more effective and to develop further services in the territory of the whole of the Czech Republic. Projects of transport infrastructure with an essential economic benefit may be an **opportunity of development** and may bring significant social benefits also outside of the field of transport. Implementation of investments not initiated by the existing or future provable demand must always reliably prove their efficiency and obtain financial resources for them, without the implementation of such investment opportunities negatively influencing priority needs of the infrastructure, transport and development. Transport Strategies are elaborated on the basis of all prior parts of the process of its creation (Book 1 - 9), particularly with regard to:

- **needs** (prognosis of traffic flows),
- **demandingness** (financial demands for sustainability of the infrastructure, development projects and their efficiency),
- **possibilities** (financial sources and time of possible commencement of implementation).

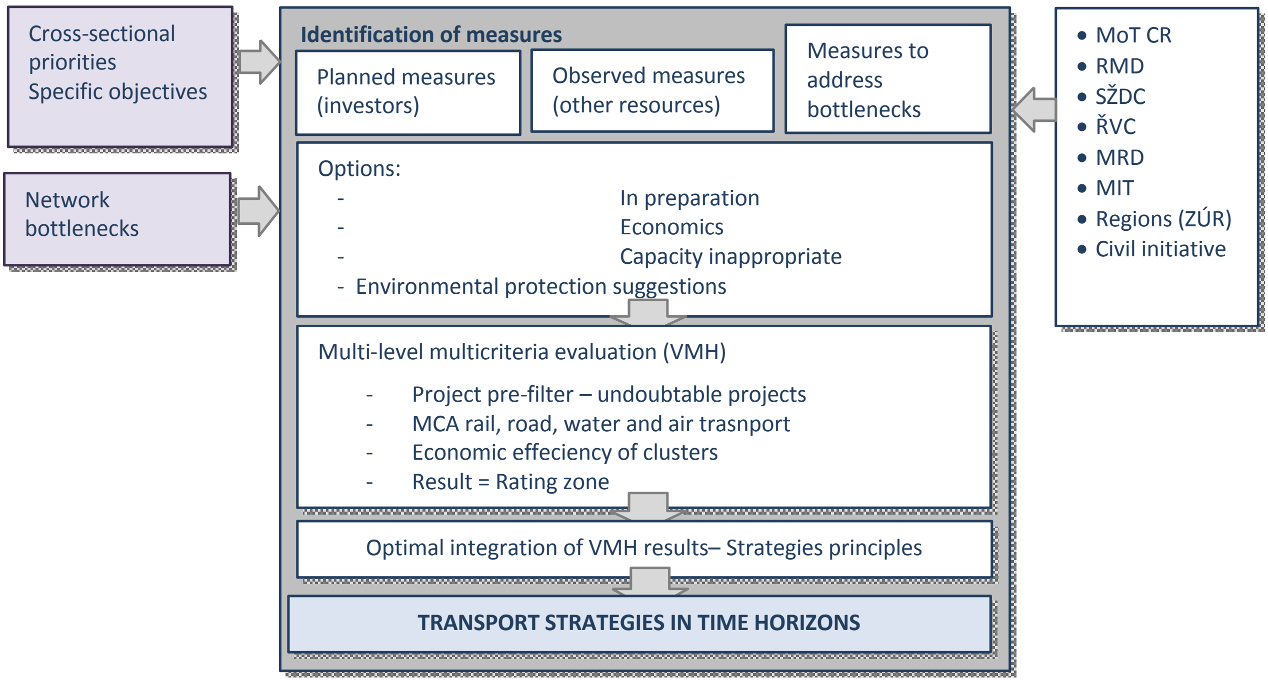


Figure 57.24 – Scheme of process of implementing Transport Strategies

57.2 Extent of analyzed transport network

Within the framework of Transport Sector Strategies of the 2nd phase, a transport network was analyzed using a created multimodal transport model in the following way:

- Into the transport model there were entered the existing transport networks to the extent of:
  - existing motorways, expressways, class I roads, selected important class II roads,
  - whole existing railway network,
  - waterways to the extent of the Dolní Labe (Lower Elbe), Střední Labe (Middle Elbe), Dolní Vltava,
  - international airport.
- Transport network, analyzed by a transport model, also includes significant foreign transport connections. Detailed nature of the transport model decreases with a distance from the border of the Czech Republic.
- This skeleton of transport networks was burdened by the current extent of transport. On the basis of outputs of this step of transport modelling, it was confirmed that the **current infrastructure does not already comply in many places with current needs.**
- Subsequently, there was carried out loading of the prospective extent of transport networks by the transport model as defined in the Policy of territorial development of CR 2008, or rather in detail in further stages of town and country planning documentation. In case of non-stabilized routing, the given relations were modelled only on the basis of connecting lines of key points, with operational parameters defined. The systemic alternatives required in the comment spot forward in the SEA process (see the example in Chapter 22) were also analysed and verified. Amount of transport in the modelled year 2050 proceeds from the model of transport prognoses prepared within Book 4 which respected the form of the selected scenario of the state of society in the year 2050 which was made within the framework of works on Book 3.
- On the basis of results of loading of this complex network (including inclusion of connecting lines representing future routes - FC/HST) it was confirmed that:

- **it is appropriate** to continue to monitor the prospective **raster of superior communications over land** with the carrying out of their capacity optimization in some of its parts with respect to estimated horizons of using up the capacity of infrastructure - see other chapters for more details. Raster of superior communications over land[17] will be further monitored in the following extent:

[17] Raster of superior communications over land consists of long-term monitored corridors of highways (D) and expressways (R) and 1st class roads which are part of TEN-T + R4 + R7 + R46 + R56 + part I/13 and R63. This does not exclude the possibility to change the routing variant in the processes of town and country planning. In connection with the currently discussed amendment to Act no. 13/1997 Sb. (Coll.), on communications over land, it is proposed that expressways become class II highways, and independently under the charges of regional authorities the individual selected sections of the network

- D1 Praha –Brno - Ostrava – state border CZ/PL,
- D2 Brno – state border CZ/SK,
- D3/R3 Praha – České Budějovice – Třebonín – state border CZ/AT
- D5 Praha – Plzeň – state border CZ/DE
- D8 Praha – Ústí nad Labem – state border CZ/D
- D11/R11 Praha – Hradec Králové – Jaroměř – state border CZ/PL
- R1 Pražský okruh /Prague Ring Road/
- R4 Praha – Nová Hospoda (outside of TEN-T)
- R6 Praha - Karlovy Vary – Cheb - state border CZ/D
- R7 and I/7 Praha – Chomutov – st. border CZ/D (outside of TEN-T)
- R10 Praha – Turnov
- R35 and I/35 state border CZ/PL/DE – Hrádek nad Nisou – Liberec – Hradec Králové – Olomouc - Lipník nad Bečvou
- R43 Brno –Svitávka - Staré Město (north – south corridor)
- R46 Vyškov – Olomouc (outside of TEN-T)
- R48 Bělotín – Český Těšín – state border CZ/PL
- R49 Hulín – Fryšták – state border CZ/SK
- R52 Brno – Mikulov - state border CZ/AT (I/52 corridor)
- R55 Olomouc – Břeclav
- R56 Ostrava – Frýdek Místek (outside of TEN-T)
- R63 Teplice – Řehlovice
- I/68 and I/11 Třanovice – Mosty u Jablunkova – state border

- Beyond the scope of this raster of superior communications, it is necessary to pay attention to the securing of quality maintenance and repairs of all other class I roads, including gradual improvement of their parameters - especially construction of bypasses of municipalities according to available resources. Within the framework of works on Book 6, there was carried out classification of importance of all class I roads.
- Sustainability of the network of class II roads and most of class III roads is also necessary to be secured from the level of regions and municipalities, which have their irreplaceable importance in securing area operation of the territory with individual and public transport.
- Prague, which is the main economic centre of the state, plays the absolutely key and unique role within the Czech Republic. In the area of road transport, the state must secure especially diverting traffic away from the most densely populated part of the city. However, smooth functioning of transport is subjected by mutual cooperation of all communications over land in the agglomeration. The road communications on the territory of the capital city of Prague are not owned by the state. However, it is absolutely essential that their full functioning and further development is secured with respect to available sources of the public sector as a whole.
- **In the area of conventional railways, raster of the superior network is defined on the basis of results of transport modelling in accordance with the form of the TEN-T network as follows:**

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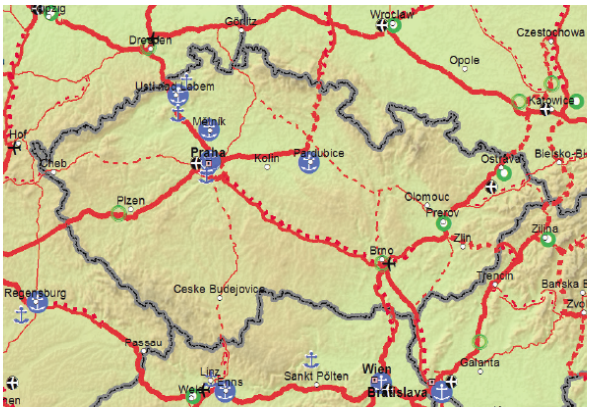
be designated as roads for motor vehicles. Considered amendment proceeds from the principles of working document published by the Ministry of Transport "New concept of a highway network". Considered amendment is in accordance with principles DSS2, nevertheless texts of DSS2 and used designation of individual communications is provided in accordance with the currently valid state.

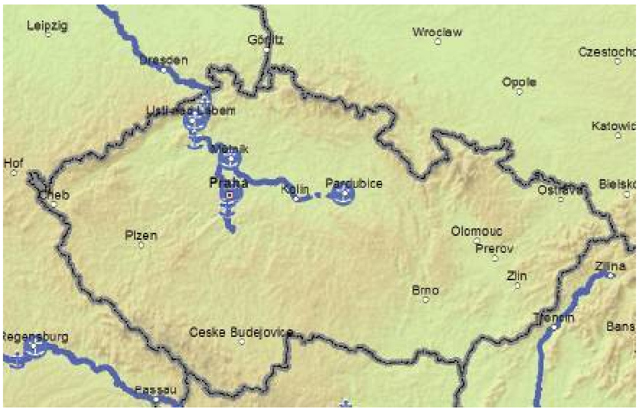
    - I. Transit Railway Corridor state border D/CZ – Děčín – Ústí nad Labem – Praha – Česká Třebová – Brno – Břeclav – state border CZ/SK
    - II. Transit Railway Corridor state border AT/CZ – Břeclav – Přerov – Ostrava – Dětmarovice – Petrovice u Karviné – state border CZ/PL
    - III. Transit Railway Corridor state border D/CZ – Cheb – Plzeň – Praha – Česká Třebová – Olomouc – Ostrava – Dětmarovice – Mosty u Jablunkova – state border CZ/SK
    - IV. Transit Railway Corridor state border D/CZ – Děčín – Ústí nad Labem – Praha – Tábor – České Budějovice – Horní Dvořiště – state border CZ/AT
    - Plzeň – České Budějovice – České Velenice
    - Plzeň – Domažlice – state border CZ/D
    - Cheb – Chomutov – Teplice – Ústí nad Labem
    - Bílina – Úpořiny – Ústí nad Labem
    - Děčín-Prostřední Žleb – Děčín – Kolín – Havlíčkův Brod – Brno
    - Hranice na Moravě – Horní Lideč – state border CZ/SK
    - Ústí nad Orlicí – Letohrad – Lichkov
    - Ostrava hl.n. – Ostrava-Kunčice – Havířov – Český Těšín
    - Praha – Václav Havel Airport Prague / Kladno (outside of TEN-T)
    - Railway junctions on transit corridors + individual parts of railway junctions Prague, Brno, Plzeň and Ostrava, where the infrastructure must be proportioned in the extent sufficient for suburban and regional transport as well as for long-distance transport.
- In the case of the railway network, savings must be sought on the basis of the process of the network restructuring. This lies not only in constructing and upgrading significant routes that have considerable society-wide importance, but also in reducing or regionalizing or privatizing those parts of the network for which it will not be possible to find economically substantiated utilization.

- **Routes FC/HST** interconnecting with a qualitatively higher railway standard the individual junction points according to the proposal of the TEN-T Regulation. Their final version, however, must be defined according to the hereinafter mentioned requirements of Transport Strategies **with the aim of quality improvement of connections in the following relations:**
    - Praha – Lovosice – Ústí nad Labem – state border CZ/D
    - Praha – Liberec – state border CZ/PL
    - Praha – Beroun
    - Praha – Brno
    - Plzeň – Domažlice – state border CZ/D
    - Brno – Přerov
    - Přerov – Ostrava - state border CZ/PL

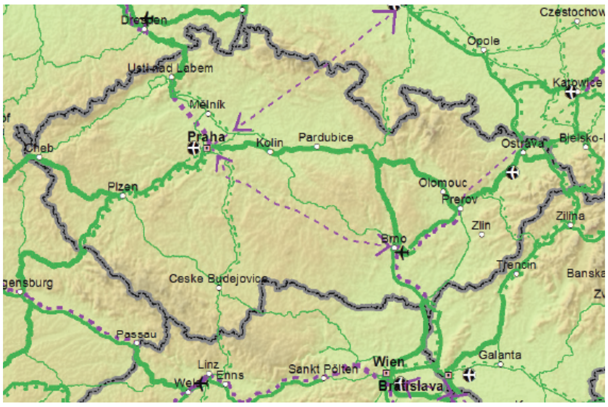
- **In the area of waterways,** the superior infrastructure is defined fully in accordance with the TEN-T. Securing the navigability of the Dolní Labe/Lower Elbe) for the maximum number of days in the year, making the Dolní Vltava and Střední Labe/Middle Elbe navigable for bigger ships. It is necessary to secure navigability of the Elbe in the territory of Germany.



Road network TEN-T



Infrastructure of waterways TEN-T



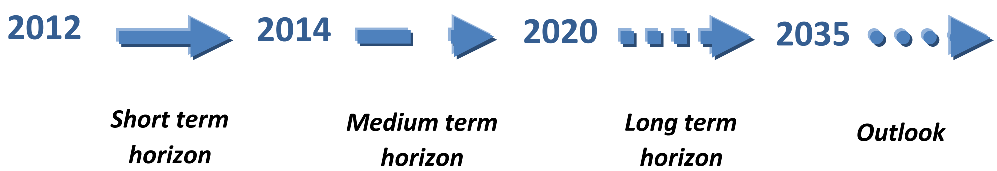
Railway TEN-T network for passenger transport

Railway TEN-T network for freight transport + MDT

Figure 57.25 – Transport networks of the CR as part of TEN-T according to the proposal for the Regulation

57.3 Time horizons

Four draft horizons have been designed for development of the Transport Strategies which the project of the transport infrastructure development will be drawn up for:



Individual part plans differ in accuracy of inputs (financial sources, state of preparation), and in the need of depth of processing for fulfilment of objectives of the strategy. Short-term horizon is expressed by the plan of investments for the year 2013 according to the SFTI budget and is taken over for the creation of the strategy without further analyzing. At the same time, there are contained in the schedule of implementation - in the years 2013 - 2015 - bigger projects (building costs over 300 mio CZK exclusive of VAT), the implementation of which will be co-financed from OPD 2007 – 2013 with the use of the rule n+2 with regard to a primary need of use of such sources. Determination of such implementation actions is determined especially by their preparability and implementability at the given time with a concurrently provable economic effect. For implementation there is preferred selection of measures for those parts of transport infrastructure which are within the framework of Transport Sector Strategies identified as significant and beneficial.

The main objective in the next time horizons being recommendation of the optimal approach to creation of the strategy (*balanced development of the infrastructure of individual transport modes, emphasis on quality maintenance and repairs, programmes of development of non-motor transport, etc.*), i.e. finding an optimal balanced approach between potential financial sources and substantiated needs.

Strategy of securing transport infrastructure proposes for various time horizons an access to needs of infrastructure, maintenance, repairs, and reconstructions, needs of transport, expressed in individual packages of measures, and needs of development with a various level of a detailed nature of the proposal in individual horizons.

The basic element for evaluation of development is always a set of constructions, the so called cluster. Results of evaluation of compact clusters are transferred to recommendations for preparation and implementation in various details:

- for the period of 2014 to 2020 to projects (and suggestions),
- for the period of 2020 to 2035 to the level of compact sets of constructions (clusters),
- for the period of 2035 to 2050 to the level of total financial resources.

If - due to preparedness of projects for implementation (objective circumstances complicating preparation of constructions) or due to insufficient financial resources in case of a non-stabilized source issue (non-adoption of a political decision on stabilization and necessary amount of financial sources) - there is not completed implementation of proposal measures in the given horizons, it is necessary - within the framework of flexible management of the strategy - to secure implementation of measures primarily in the following period.

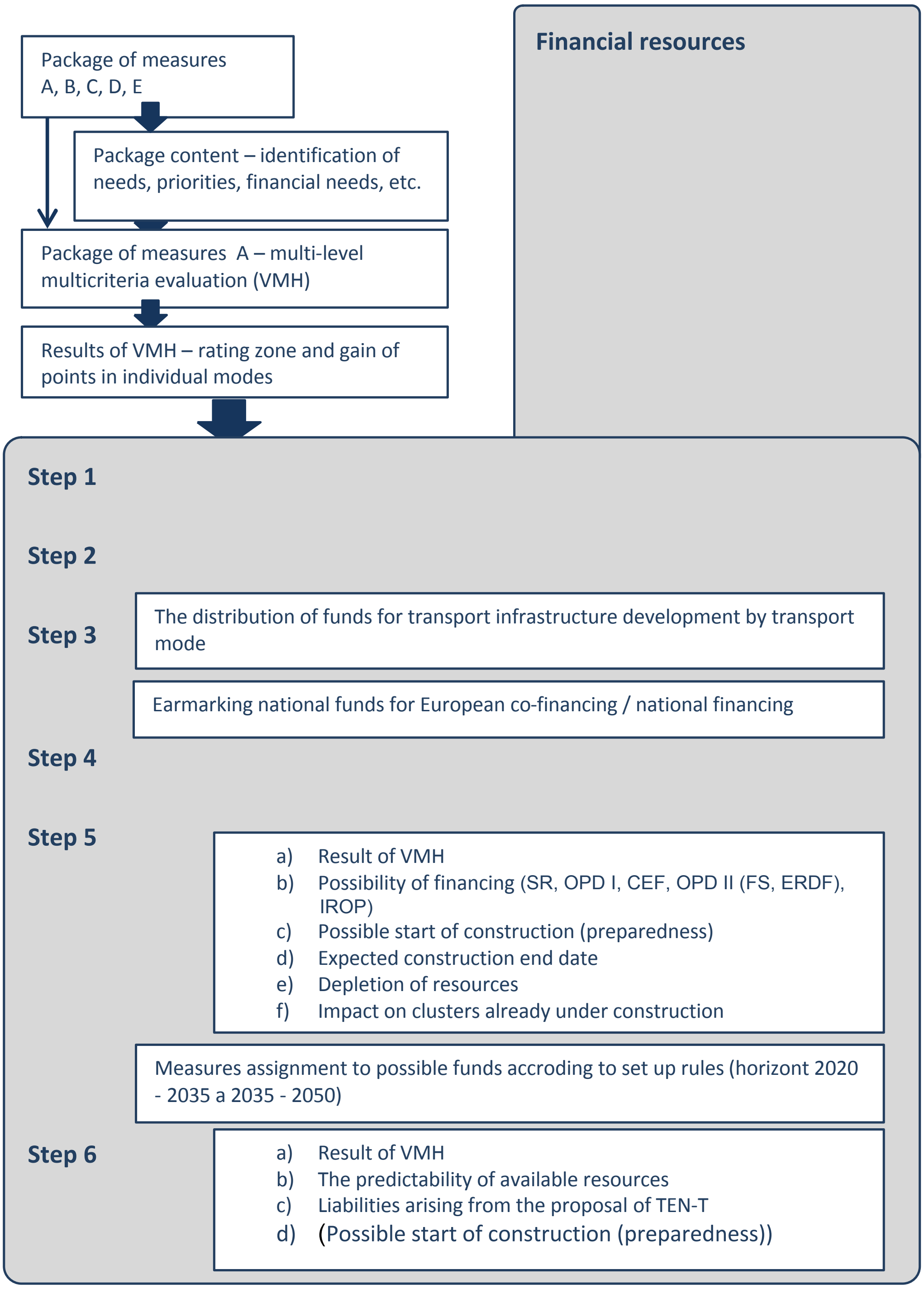


Figure 57.26 – Scheme of Transport Strategies preparation in time horizons

58 Input data

58.1 Definition of needs - requirements of securing transport infrastructure

Transport Strategies primarily deal with the securing of transport infrastructure administered by the state. The basic output of Transport Strategies is the stating of a fact that despite the increasing role of user charging, which is desirable to further effectively strengthen in the next period, it is a must to understand comprehensive securing of functionality and development of transport infrastructure as a public service which cannot do without sources of funding from public budgets.

<u>Functioning transport is a key precondition for the functioning of economy.</u> Without functioning transport, or transport infrastructure, our economy will not be functional, either. This objective is cross-sectionally addressed in all key strategic documents and approved several time by the government.

The Supreme Audit Office has been criticising over a long period in its auditing conclusions that the Ministry of Transport does not dispose of a fixed concept. No matter how the Ministry of Transport manages - on the basis of the process of acquisition and securing of sustainability of Transport Strategies - to clearly name its medium-term priorities, <u>implementation of Transport Strategies - strategy of sustainability and further conceptual development of transport and transport infrastructure - is difficult to secure without a stable and annually predicted resources!</u>

Proposed measures for the securing of transport infrastructure was classified within Book 6 into general groups of packages which are subsequently divided into categories of packages and further into individual packages of measures. **Definition of concrete packages was prepared on the basis of an analysis of needs and opportunities of transport infrastructure.** Level of detail of packages corresponds with a strategic level of the national plan of development of infrastructure. Financial resources are allocated in the plan of implementation of Transport Strategies to the following 5 general groups of packages:

A. The main priorities of construction and modernization of transport networks
B. Supporting activities for development of the transport infrastructure
C. Basic acts within the scope of administration of the infrastructure
D. Financial support of development of important infrastructure at the regional or town level
E. Projects expected to be possibly funded from regional operational programs in the period of 2014 – 2020 (IROP)

Basic structure of financial demands of transport networks was selected according to the purpose for which the financial resource are and must be designated and expended. This structure is described via packages of measures extended by other items with costs of administration and operation. Mainly, it concerns the following items:

- **Operation of transport networks** = management of transport on transport networks and its institutional securing,
- **Operability of transport networks** = securing regular maintenance, repairs and reconstructions of transport networks,
- **Development measures** = measures of an investment character which bring a significant benefit for development of transport (quality of operation) on transport networks or a benefit in the form of higher parameters.

From the viewpoint of specific priorities and objectives of Transport Strategies, the most important group of packages being C - containing maintenance, repairs, and reconstructions and measures for removal of ecological burdens (needs of infrastructure). Detailed analysis stipulating mandatory costs necessary for the securing of operability of transport networks was analyzed in detail in Book 7. An unquestionable fact being that the existing transport infrastructure has been undermaintained over a long period and the internal debt of this infrastructure has been increasing more and more. Bad state of the existing infrastructure must be then dealt with by investment actions within the scope of modernization or optimization which always have in relation to the given infrastructure an added value, nevertheless, investment resources expended on such projects cannot be utilized for further necessary development of new parts of the network. For the said reason - within the scope of the securing of implementation of Transport Strategies - the group of packages C, including operation, maintenance, repairs and systematic reconstructions, are proposed to be gradually increased finance allocations while concurrently respecting real possibilities of the source side according to the Proposal variant of funding (Proposal variant of funding is described in chapter 58.2 or 58.3, as the case may be). As a part of the gradual increasing of the finances for maintenance and repairs, more emphasis needs to be paid to the systemic character and efficiency of the spending of these financial resource, incl. the securing of necessary staffing on the side of the infrastructure administrators.

For the said reasons, it is necessary to consider expenditures on transport infrastructure - at least at the level necessary for the securing of its operation and operability from the side of the public sector - as mandatory. Thus, fixing necessary financial resources at least for the securing of these activities cannot be perceived as giving preferential treatment to the sector of transport over other areas of the national economy, for without functional transport and transport infrastructure the economy of the CR, which in turn generates sources for public budgets, will not be functional.

- Transport infrastructure analyzed within the framework of Transport Strategies is in the possession of the state, and the state is thus obliged to maintain it (therefore the situation cannot be compared with the industry, energetics or agriculture where business entities are private companies). Here, the state is the administrator of property and creates prerequisites for undertaking business in all other sectors (including transport operation itself). Big annual fluctuations of financial resources are one of the main causes of not fully effective management with respect to transport infrastructure. Thus, it primarily does not concern the increasing of funds, but stabilization of sources necessary for maintaining operability of transport networks with the aim of stopping increasing the internal debt attached to state-owned transport infrastructure.

- In comparison with other sectors of the government administration, it is necessary to perceive this fundamental difference when transport is the sector which is unlike any other sector without fixed expenditures of public budgets burdened with specific taxes - especially **excise tax on mineral oil.** Yield from this tax is directly proportional to the extent of transport. For the increasing of the extent of transport (and thus equivalently yield from this tax), the functional transport infrastructure is a necessary condition even the primary objective is to satisfy society-wide transport needs with a maximum effect, i.e. with the least traffic demand).

Regular expenditures (operation, operability) are foreseen in individual years and are taken over from Book 7 (if they were available), further expenditures for effective functioning of transport networks are then planned as annual costs in a necessary amount (see chapter 58.4).

A very important element of implementation of Transport Strategies is institutional securing of functionality of the Ministry of Transport described in chapter 62.1 Implementation of proposed measures is necessary especially for the securing of absorption capacity for increasing (in amount) resources for maintenance and repairs so that they are not used only for the increase in administrative activities connected with the award of works. Funds must go - during repairs - directly into the maximum effective (simplified - e.g. framework contract) specification of public contracts for repairs and reconstructions. Institutional securing of the Ministry of Transport must be also effectively adapted to the possibility of securing sustainability and implementation of principles contained in Transport Strategies.

Financial demands of development measures (Packages A.1-A.4) are taken into consideration in aggregate for the proposal time period, subsequently, there is proposed a schedule of their implementation according to possibilities of the source side (Proposal variant of funding described in chapter 58.2 or 58.3).

However, it is not just the absolute amount of financial resources that will help to accelerate meeting the priority needs. Many development plans solving the key needs have not been sufficiently prepared in terms of investment so that their implementation could start. No absolute increase in financial resources will help to rectify the situation. Therefore, maximum efforts have to be exerted to finish preparation of these key measures in terms of investment as soon as possible. When they are prepared, it will then be necessary to secure financial sources to cover the key needs.

58.2 Available sources for funding TI

One of the key factors for the securing of functionality and planning of development of transport infrastructure is stability and volume of available financial resources, at least at the level of securing quality operation and operability of existing transport networks (see 58.1). In order to propose the effective strategy of maintenance and development of transport infrastructure, it is necessary to dispose of a long-term stabilized outlook of available financial resources even for development investments.

Future development of available sources, however, depends on a number of unknown facts, especially on a political decision regarding combination of used sources of funding, weight of individual sources (source mix) and last but not least on the total financial resources designated for funding TI. In Book 9, there are created four model scenarios which show an influence of individual measures on the source side. All these models - with the exception of the Restrictive variant (which does not secure fulfilment of objectives of Transport Strategies), however, foresee political decisions. **Within the framework of Report Z.10.2. - by which there was fully incorporated into this book 10 a feedback of the Contracting Authority -** there was prepared the so called "**Proposal variant of funding**" which does not foresee concrete political decisions, however, at the same time it quantifies the necessary resources for fulfilment of the main (not all) objectives of Transport Strategies. Proposal variant of funding is drawn up as relatively conservative as regards the total resources available for implementation of development plans.

Reason for the preparation of the Proposal variant of funding is an attempt to minimize somewhat considerable influence of results of the strategy as a consequence of such decisions in the future period. In the next parts of this Book 10, there is also described - within the framework of flexible management of the schedule of implementation of Transport Strategies - an approach in case of a different degree of available resources for implementation of development measures than expected in the Proposal variant of funding.

One of desirable outputs in relation to Transport Strategies being a political consensus regarding the preferred variant of stabilization of sources for funding DI in terms of the amount of sources of funding DI in the long run. Step concurrently taken must be professional-political discussion regarding an appropriate combination of measures in the short-term and medium-term horizon for fulfilment of the amount of sources corresponding with the selected variant.

58.3 Proposal variant of funding TI

In all four model variants of funding presented in Book 9 - with the exception of the Restrictive variant - there was allowed for a proposal of concrete system changes on the source side including involvement of debt funding payable from own guaranteed funds of the Ministry of Transport (debt funding via SFTI or RMD).

Interest of the Ministry of Transport is, however, to define - within the scope of Book 10 - an implementation schedule of Transport Strategies in such a form that will not foresee future political decisions on the form of stabilization measures of the source side of the department, but which will - at the same time - secure financial resources in such an amount that will enable to implement the fundamental mission of Transport Strategies, i.e.:

- **to secure gradual necessary increase of financial resources for maintenance of networks so that there does not occur any further increase of internal debt and this debt is gradually reduced[18],**
- **to secure enough sources for continuous co-funding of EU funds in the period of 2014 – 2020 with the use of rule n+3 incl. co-funding of projects implemented within the scope of OPD I in the years 2014 – 2015 (use of rule n+2)**
- **with the use of EU sources, to implement primarily priority development projects according to results of mutual evaluation contained in the Transport Strategies**
- **to fulfil obligations arising from the prepared TEN-T Regulation, namely completion of the TEN-T core network by 2030 and completion of the TEN-T comprehensive network by 2050 at the latest[19]**

For the purpose of fulfilment of these requirements, it is not possible to proceed from any of the scenarios modelled in Book 9, for the Restrictive variant, which - as the only one - did not foresee any system changes, did not secure at the same time enough sources for fulfilment of the objectives set. All other variants contained in Book 9 already included system changes subject to political decisions and at the same time did not reflect in a sufficient extent a real state of preparedness of key constructions for implementation, for they were prepared already in introductory phases of the project of Transport Sector Strategies. These variants of funding assumed in a various degree the use of debt financing payable from own sources of the Ministry of Transport in the medium-term horizon of 2014 - 2020 for the securing of implementation of key structure, or for the securing of co-funding of EU sources in case that such co-funding could not be secured from public sources. Possibility of use of debt financing payable from own sources of the Ministry of Transport is, however, according to principles of Transport Strategies contained in Book 9, admissible just and only for entirely fundamental and priority projects according to results of assessment of needs and effect of investments with the inclusion of the money price, or for possible co-funding of EU sources in case that it could not be secured in a sufficient resources from public budgets.

[18] The amount of internal debt and necessary increase of financial means is analysed in detail in the full version of Book 7 available at www.dopravnistrategie.cz

[19] By meeting obligations arising from the proposal for the TEN-T regulation, there will be concurrently secured a quality skeleton of a functional logical superior network of safety infrastructure with minimum environmental influences, compliance - in a maximum possible extent, given by available financial means - with a traffic demand in 2050 (need of transport). With this adjustment of financial parameters, however, development of the TEN-T network and the network following up to the TEN-T will not be developed with the pace corresponding with already actual needs and society-wide expectations.

Therefore, the Ministry of Transport used a Simulator of sources created within the framework of works on Book 9 and it determined - with the use thereof - the Proposal variant of funding which indicates a necessary resources for fulfilment of the said above. This scenario does not take into account involvement of debt financing payable from own sources and at the same time it calculates a necessary resources which must be available so that the targets set for its creation are fulfilled.

On 12 June 2013, the Czech government approved the paper “Transport Policy of CR 2014 – 2020 with the Prospect of 2050” by its Decree No. 449. In the approved wording, the Ministry of Transport has been **guaranteed national resources amounting at least to 43 billion CZK/ year**, stating that measures are to be taken to stabilize sources at least in this amount. However, the amount of the national source sis still lower that it is required for achieving the total resources according to the proposal variant of financing which will enable the main defined objectives to be met.

Without timely adoption of stabilization measures requiring necessary legislative regulations through which there will be achieved a necessary funds in the amount of approx. 70 billion CZK/year (at fixed prices of the year 2012, see Table 56.86: Financial resources corresponding with the Proposal Variant of Funding in the variants with and without stabilization measures taken), **it will not be possible to fully observe the schedule of implementation of Transport Strategies given in annexes to Book 10.**

Only indicatively, in this scenario there are proposed solutions to possible legislative measures arising from proposals contained in Book 9 which would lead to stabilization of sources in the said amount:

- Increase of the proportion of an excise tax on fuels and oil for SFTI from the current **9.1% to 25%** for the purpose of stabilization of SFTI funds in such an amount that will enable the securing of operation and operability of the existing transport infrastructure without a necessity of a state subsidy,
- **Linking up the investment state subsidy by a legislative measure with GDP** or with any other macroeconomic indicator to enable implementation of a necessary amount of investment events which will enable achievement of the four above-mentioned set targets (in this case, there is modelled a state subsidy in the amount of 0.3% GDP).

Of course, it is possible to adopt other legislative measures according to the recommendation of Book 9 which would lead to necessary stabilization or a slight increase of the source side of the department, not at the expense of the state budget, but at the expense of users (increase of collection of a road tax, increase of prices of motorway coupons, increase of collection of tolls from 2015 for EURO V, etc.).

To enable implementation of Transport Strategies, a concrete form of legislative measures that will lead to stabilization of the source side in the necessary amount is not the key issue. But the key issue is that there is secured in terms of legislation at least the said necessary resources in the given years.

Apart from indispensable stabilization of sources at the level necessary for the securing of operation and operability of the existing transport infrastructure, it is requisite that the resource side for investments - implementation of development plans - be stabilized at least in the given degree. Annual allocation of a state subsidy on the basis of consideration of the Act on State Budget does not enable the Ministry of T**ransport to responsibly plan implementation schedules, for construction of the transport infrastructure is always a matter of more years.**

Implementation of a concrete bigger new transport construction (regardless of long length of preparation) usually lasts more than 3 years. Non-observance of medium-term outlooks of SFTI and allocation of a state subsidy ad hoc from year to year does not enable investments or maintenance and to effectively plan repairs. Therefore, there occur situations when constructions - if they are to be commenced - are commenced without certainty of their source coverage throughout the whole period of implementation, which should be prevented in future. In case of reduction of the state subsidy against the budget outlook, there must take place conservation of constructions, prolongation of the date of implementation, the price goes up = leading to ineffectiveness.

Stabilization of sources is also necessary for the business sector (building industry, design and engineering companies) which will be able - in case of a predictable resources - to better adapt the planning of its available capacities, which as a result will contribute to better price offers than in case the volume of works in the following years is entirely unpredictable.

Selection of contractors of building works pursuant to Act on public contracts often takes place more than half a year. The Ministry of Transport needs to have a predictable volume of sources secured in order to have the opportunity to successfully implement the contract after the award of the tender. There is necessary a guarantee that planned and exceedingly necessary investments (new investments and structural repairs) will be able to take place in the given time and that there will be enough resources for the co-funding of EU investments in the program period of 2014 - 2020.

If stabilization measures are not adopted, there cannot be excluded that in the proposed schedule of implementation of Transport Strategies there may occur time changes with concrete measures.

Other changes may be brought about by complications in the investment preparation of constructions which will result in postponement of a possible date of factual commencement of implementation of the given measures.

However, these changes cannot be perceived as non-observance of principles of Transport Strategies the objective of which in the area of development measures being primarily identification of fundamental necessary projects with regard to available sources and need of fulfilment of the set objectives in the medium-term and long-term horizon.

A not insignificant risk is also the securing of transferability of the principles of Transport Strategies to the SFTI budget and their political acceptance.

Savings within the transport sector may be found mainly in the price for the service of collection of tolls and further directly in prepared projects with which there must always be proved an economic effect of their implementation.

With respect to increasing costs of maintenance and repairs in time there is decrease in amount of fund available for new development investments. Total amount of sources is, however, relatively stable in time (with the exception of the period after termination of the drawing of EU funds 2014 - 2020 in 2023 (use of rule n+3). Moreover, quality improvement of maintenance will lead to reduction of pressure in future on the extent of development investments, for the current practice is dealing with the issues of sections unsatisfactory in terms of traffic via projects of modernization, optimization or revitalization. **This fact does not mean non-stable environment for design and building companies or companies procuring engineering and preparation of constructions.** Even the funds expended on systematic repairs and reconstructions will be implemented via public contracts of a building character, and it shall pay at the same time that these public contracts will be more flexible from the viewpoint of time requisite for handling necessary permissions than in case of new constructions. However, extent of funds for design(ing) works has - in the long run, after 2030 - a decreasing tendency, for in this period it is possible to already expect preparedness of all fundamental new measures. **In 2023, a significant slump in the predicted sources occurs.** This prediction is caused by failing to anticipate availability of sources from EU in the next programming period. This slump may be mitigated in case that in this period there will still be available for the CR European sources which the Proposal variant of funding does not take into account for the time being due to considerable uncertainty of their availability. However, at the same time **it is necessary to make required efforts to obtain EU support** in this period as well, at least for the implementation of the objectives of the European transport policy. Particularly, it concerns the performance of the set objective to triple by the year 2030 the extent of high-speed railway lines (VRT) in Europe against the state in the year 2010 (article 2.5. of the European Transport Policy). If this objective continues to be followed by the European Commission in all seriousness, the European funds must be available to all countries for the period after the year 2020, in a sufficient degree, and they must be intended, particularly, for development of the VRT line. Unless there are the EU sources available for the Czech Republic in this period, the predicted slump will have the same impacts on the whole construction and transport sector as it had in 2010 – 2013.

According to results of Transport Strategies, it is necessary to speed up and increase the efficiency of preparation of key measures so that within the horizons proposed in the Transport Strategies they could be implemented. For this purpose, the Ministry of Transport adopted - already in 2012 and at the beginning of 2013 - concrete measures which are dealt with in chapter 59.

Proposal variant of funding was created on the basis of feedback of the Contracting Authority in discussing final parts of the project of Transport Strategies and in creating Report Z.10.2. Proposal variant of funding fully respects - on the expenditure side - the structure of packages, measures and suggestions, nevertheless, it has the following differences from previous Books of Transport Sector Strategies. Need of this approach is initiated by objective possibilities of the source side and concurrent institutional arrangement of the Transport Ministry.

Costs of operation of a railway transport route are approached differently from previous parts of the work. Part of the **Proposal variant of funding** are not costs of operation of a railway transport route and yields from operation of the railway transport route. The reason being that income from the railway transport route does not enter - in terms of a balance sheet - into sources and expenditures of SFDL on the basis of which quantification the Proposal variant of funding is based. A fee for the use of the railway transport route is a direct income of RIAwhich pays therefore costs of operation of the railway transport route. Any loss which, however, should be systematically minimized is and will be evened up from the budget chapter of the Ministry of Transport. Adjustment of the amount of the fee for use of the railway transport route is not - in accordance with the European legislation - within the competence of RIA. Need of adjustment - for carriers - of a long-term predictable amount of this charge shows to be necessary, which is also presumed by valid legal regulation.
Group of packages C containing maintenance, repairs, and reconstructions and measures for removal of ecological burdens (needs of infrastructure) is proposed - within the Proposal variant of funding - more gradual and, on the whole, lower increase of financial allocation than was indicated as necessary in the course of works on Transport Strategies. Reason for preference of a gradual increase is a necessity to primarily secure on the side of administrators of transport infrastructure absorption capacity for effective use of such means (staffing, systematization of passports of property, specification/detailing of systems of management with infrastructure, effective and transparent selection of suppliers of works). Another reason for more gradual increase of financial resources to a necessary level being other priorities on the expenditure side which cannot be influenced in the short-term horizon and to which are tied future financial sources.

Proposal variant of funding of transport infrastructure with implementation of system changes (fixed prices of the year 2012)
(increase of the proportion of an excise tax on fuels and oil to 25%, tying of the state subsidy to the amount of GDP - here the state subsidy in the amount of 0.3% GDP)

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Today´s situation: Proportion from the collection of the excise tax in financing DI 9.1 % (billion CZK)	7,1	7,2	7,2	7,3	7,3	7,3	7,4	7,4	7,5	7,6	7,6	7,6	7,6
Today´s situation: Necessary amount of the state subsidy in case of non-adoption of changes	18,9	20,1	25,6	26,1	26,3	26,8	27,3	28,5	29,1	29,6	30,1	30,6	31,1
After change: Proportion from the collection of the excise tax in financing DI 25 % (billion CZK)	-	-	*19,7*	*19,8*	*19,8*	*20,0*	*20,2*	*20,6*	*21,0*	*21,2*	*21,3*	*21,4*	*21,5*
After change: Subsidy from the state budget in the amount of 0.3% GDP (billion CZK)	-	-	*13,1*	*13,6*	*13,8*	*14,1*	*14,5*	*15,2*	*15,6*	*16,0*	*16,5*	*16,8*	*17,1*
Road tax (billion CZK)	5,2	5,2	5,4	5,6	5,6	5,8	6,0	6,2	6,3	6,5	6,6	6,8	6,9
Performance charging of trucks over 3.5t (billion CZK)	8,3	8,3	9,0	9,2	9,3	9,6	10,4	10,9	11,4	11,9	12,4	12,8	13,2
Charging of passenger cars up to 3.5t (billion CZK)	3,9	4,0	4,0	4,1	4,1	4,3	4,5	4,6	4,8	5,0	5,3	5,4	5,4
Sources from the EU funds (billion CZK)	19,3	21,0	20,8	17,6	16,5	15,2	14,5	12,0	11,8	8,3	5,7	-	-
Sources in total	*62,6*	*65,8*	*72,0*	*69,9*	*69,1*	*69,0*	*70,1*	*69,6*	*70,9*	*68,9*	*67,7*	*63,1*	*64,3*

Proposal variant of funding: Sufficient amount of means for the cofunding of OPD II, partially also for national events, guarantee for completion of TEN-T (including the part of fast connections) by 2050 - international obligation of the CR.

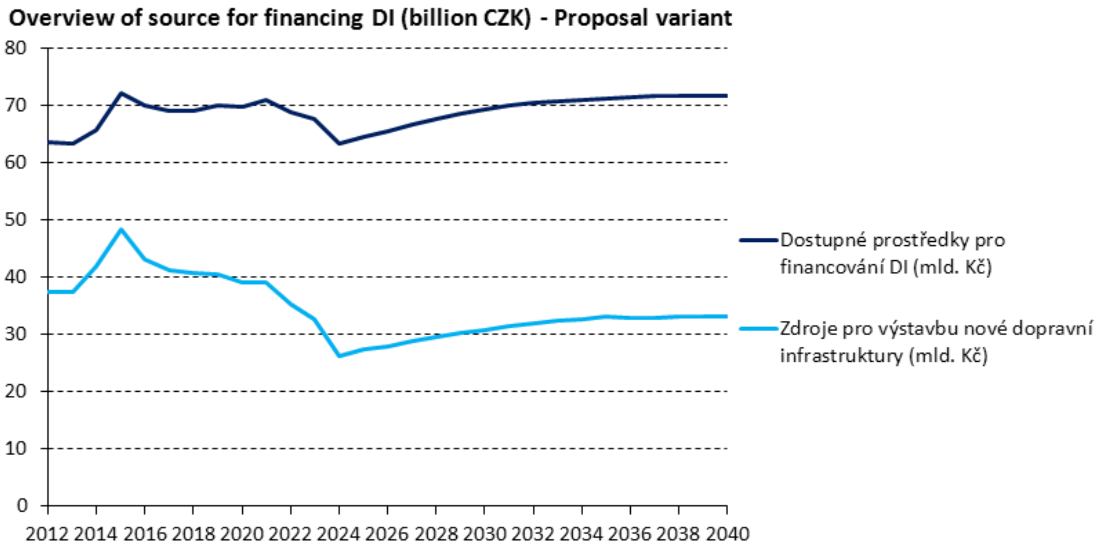
Line "Sources in total" quantifies a necessary amount of volume of sources for SFDI. For achievement of targets of DSS2, it is necessary to achieve this total volume each year - for the given reason it is ideal to adopt proposed stabilization measures.

Lines 1 and 2 state a necessary amount of sources in the current state without system stabilization changes on the source side.

The third and fourth line shows an amount of sources upon adoption of stabilization measures given in the heading of the table from 2015 (substitute of sources given on line 1 and 2 from 2015)

Gradual increasing of means for maintenance and repairs in connection with extension of the network and in connection with the need to systematically increase repairs and maintenance.

Growth of guaranteed incomes (excise tax, proportion in GDP) according to macroeconomic development and development of transport performances (here both indicators increase in time)



(Source: Analysis of MoT with the use of a simulator of sources prepared within Book 9)

Table 58.90 – Financial sources corresponding with the Proposal variant of funding in the variants with and without stabilization measures taken

58.4 Allocation of financial sources to individual packages of measures

As it was already stated in chapter 58.1, the funds are allocated within implementation plan of Transport Strategies into five general groups of packages:

A. Main priorities of construction and modernization of transport networks of the state and international importance

B. Supporting activities for development of transport infrastructure of at least state importance

C. Basic acts within the scope of administration of infrastructure (maintenance, repairs etc.)

D. Financial support of development of important infrastructure on the regional or municipal level

E. Regional projects expected for possible funding from planned operational programmes 2014 - 2020.

The following Table 58.91 – Annual financial needs for packages of measures summarizes a need of financial coverage of individual packages of measures in the defined time horizons (necessary annual average allocation of costs of individual packages in the given period) while concurrently reflecting available resources of the Proposal variant of funding.

- Within the framework of groups of packages mentioned herein, there is not quantified in this chapter a necessary degree of financial resources for development categories of packages A.1 – A.4, which are dealt with separately in chapter 60.
- In terms of funds, a general group of packages B - including equipment for transport management, information systems and measures for increasing safety - is important. Within the general group of packages B, there are also included costs of operation of ITS systems, including a toll system (without its considerable extension) and development investments serving for fulfilment of a requirement for interoperability, safety and demandingness of the management of operation of the railway transport route (GSM-R, ETCS, EMC, DOZ systems). Requirements for the securing of interoperability follow from the European legislation[20] and there is put a priority emphasis on them both within the scope of the European transport policy, and the TEN-T policy. Within the framework of reallocation of available resources, there is expected coverage of such investments from national sources. However, the given events are also commonly qualified for the co-funding from the EU sources. Therefore, it

[20] Directive 2008/57/EC on the interoperability of the rail system within the Community; Directive 2004/49/EC on safety on the Community's railways and on amendment of the Council Directive 95/18/EC on the licensing of railway undertakings, directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (Railway Safety Directive), further specified in individual TSI - technical specification of interoperability.

is appropriate to seek approval of such projects enabling to also use for the implementation thereof these sources. Packages B.3 and B.4 are not paid from the sources considered within the framework of TSS2. From the sources of state enterprises of Povodí (Ministry of Agriculture) there is paid lockage of vessels through lock chambers, operation of river information services is secured by Státní plavební správa /State Navigation Administration/. Air traffic control is paid by the state enterprise Řízení letového provozu.

- General group of packages C includes mandatory costs for the securing of operation and operability of the existing transport networks, or more precisely, networks newly implemented in the following periods in accordance with needs described in chapter 4.1. This group of packages must be allocated the resources with priority in drawing up short-term plan of funding - annual SFTI budgets. **In case that there occurs transfer of railway buildings and related property from České dráhy, a.s., to state organization RIA, it will be necessary to financially strengthen this package with an equivalent amount which is paid today to carriers within the scope of an order of public transport** (payment of the order would be decreased by this amount). An alternative solution being introduction of such a component of the fee for the use of the railway transport route that would be paid by all carriers directly to RIA. Package C.3 is not paid from the sources of the Ministry of Transport - paid by state enterprises - Povodí.
- General group of packages D quantifies a necessary financial share of the state in the implementation of projects of important infrastructure at the regional or town level due to a need of the securing of more effective functioning of transport infrastructure as a whole. Costs of package D.7 are not allocated separately, for improvement of these parameters will be continuously secured within the scope of investment packages and within the scope of the securing of operability of the infrastructure (B.2 + other investment funds for individual measures). Package D.8 (Support of maintenance, repairs, and renewal of class II and III roads) serves solely for removal of emergency conditions limiting the area transport services through road transport due to failure of respective administrators, or due to non-securing a sufficient amount of funds on the side of these administrators.
- Within the framework of the general group of packages E, there are allocated only sources for financing regional projects of recreational waterway transport with which there is expected utilization of the sources from the Integrated Operational Program, with the concurrent securing of preparation and implementation of these projects from the level of an entity operating state-wide. Neither national nor IROP sources are stated with respect to 2nd and 3rd class roads, that can be expected to be co-financed from IROP, because they have to be secured/balanced from the level of regions as the administrators of this infrastructure.

- From investment costs there were earmarked separately the costs of project and investment preparation (proprietary preparation and engineering activity) which are considered with regard to a proved need of further development of transport infrastructure as quasimandatory. In connection with an adopted amendment to Act no. 416/2009 Sb. (Coll.), which is effective from 1/ 2/ 2013, there is expected a considerable decrease of prices which are connected with the proprietary preparation. Upon evaluation of really achieved costs of this activity, reduction of these amounts by an equivalent difference is admissible in the following period. However, there should not be reduced amounts for project and engineering activities.

A detailed overview of the content of these packages is provided by the prepared Book 6 of the Transport Sector Strategies 2nd Phase project which will be used when deciding on the securing of financial coverage in drawing up short-term financial plans - annual SFTI budgets.

Package	Item	Annual expenditures (bil. CZK/year) (price level 2012)		
		2014 -2020	2021 - 2035	2036 - 2050
	Project and proprietary preparation	3,5	3,5 -> 2,5	2,0
A.5	Development of transport terminals	0,1 – 0,3	0	0
B.1	Introduction and development of ITS for road transport on motorways, motorways and Ist class roads	4,0 – 3,8	3,8 – 3,5	3,5
B.2	Safety and the environment	0,2 – 0,3	0,2	0,2
B.3	Equipment for traffic control on the railway infrastructure	1,6 – 2,4	2,3 – 0,3	0,3
B.4	Traffic control of water infrastructure	-	-	-
B.5	Air traffic control	-	-	-
B.6	Equipment of transport terminals	0,2 – 0,3	0,3 -> 0	0
	Management and operation	2,0 –> 1,8	1,8	1,8
	Railway transport operation	-	-	-
C.1	Securing of system funding of maintenance, repairs, reconstruction of the railway transport infrastructure	8,2 -> 12	12,5 -> 15,2	15,2
C.2	Securing of system funding of maintenance, repairs, reconstruction of the state road infrastructure	6,7 -> 10,2	11,0 -> 16,0	16,0 -> 16,5
C.3	Securing of system financing of maintenance, repairs, and renewal of waterways	-	-	-
C.4	Limitation of the impact on the environment and public health	0,3 – 0,4	0,4 - 0	0
D.1	Support of development of infrastructure of public transport	0 – 0,2	0,2	0,1
D.2	Modernization of technical infrastructure of important public regional airports with international operation	-	-	-
D.3	Building of cycling infrastructure	0,2 – 0,3	0,2 – 0,3	0,2 – 0,1
D.4	Introduction of intelligent transport systems in towns	0,1	0,8	0,8
D.5	Improvement of safety of road infrastructure in towns	0,1 – 0,2	0,2 – 0,3	0,2
D.6	Making public transport accessible to persons with a limited ability of movement or sense of direction	0 – 0,1	0 – 0,1	0 – 0,1
D.7	Limitation of the impact on the environment and public health	-	-	-
D.8	Maintenance, repairs, and renewal of the IInd and IIIrd class roads	0,2 – 0,7	0,2	0,2
D.9	Support of development of ports and logistical centres in private ownership	0,1	0,2	0
E	Regional projects expected for funding from Operational programmes in the period of 2014 - 2020	-	-	-
	Mandatory packages (Administration and operation without operating the railway, B 1.3, C.1, C.2, C.3)	23,8 -> 30,7	32,3 -> 41,0	41,4 -> 43,0
	Investment packages A.5, B besides B 1.3, C.4, D	4,7 -> 9,0	8,3 -> 4,1	3,9 -> 3,7

Note: Apart from development packages A.1 – A.4 and apart from special project packages - Proposal variant of funding (fixed prices of the year 2012). A dash means a range of average allocation in the given period, an arrow (->) means a trend of expenditures in the given period.

Table 58.91 – Annual financial needs for packages of measures

One of the basic requirements of the Transport Strategies being **the securing of a gradual increase of expenditures for the securing of operability of transport infrastructure - securing systematic maintenance, repairs, and reconstructions of a road and railway network (packages C.1 and C.2)**. For this purpose, there is attached - within this Book 10 - a detailed analysis quantifying the necessary increase along with its reasoning (selection from Book 7).

Proposal variant of funding	Mandatory expenditures in 2013 – 2023 (price level 2012)										
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Mandatory costs in total	**23,4**	**23,8**	**23,8**	**26,9**	**27,9**	**28,3**	**29,7**	**30,6**	**31,8**	**33,5**	**35,0**
System maintenance and repairs of motorways and class I roads	6,5	6,7	6,7	8,8	9,0	9,5	9,9	10,2	11,1	12,1	13,0
System maintenance, repairs and revitalization of railways	7,9	8,2	8,2	9,2	10,0	10,5	11,4	12,0	12,5	13,3	13,8
Project preparation and preparation referring to proprietary rights	3,5	3,8	3,8	3,8	3,8	3,8	3,8	3,8	3,8	3,8	3,8
Operation of the toll system	3,5	3,5	3,5	3,5	3,5	3,0	3,0	3,0	3,0	3,0	3,0
Administration and operation of organizations	2,0	2,0	1,9	1,9	1,9	1,9	1,9	1,9	1,7	1,7	1,7

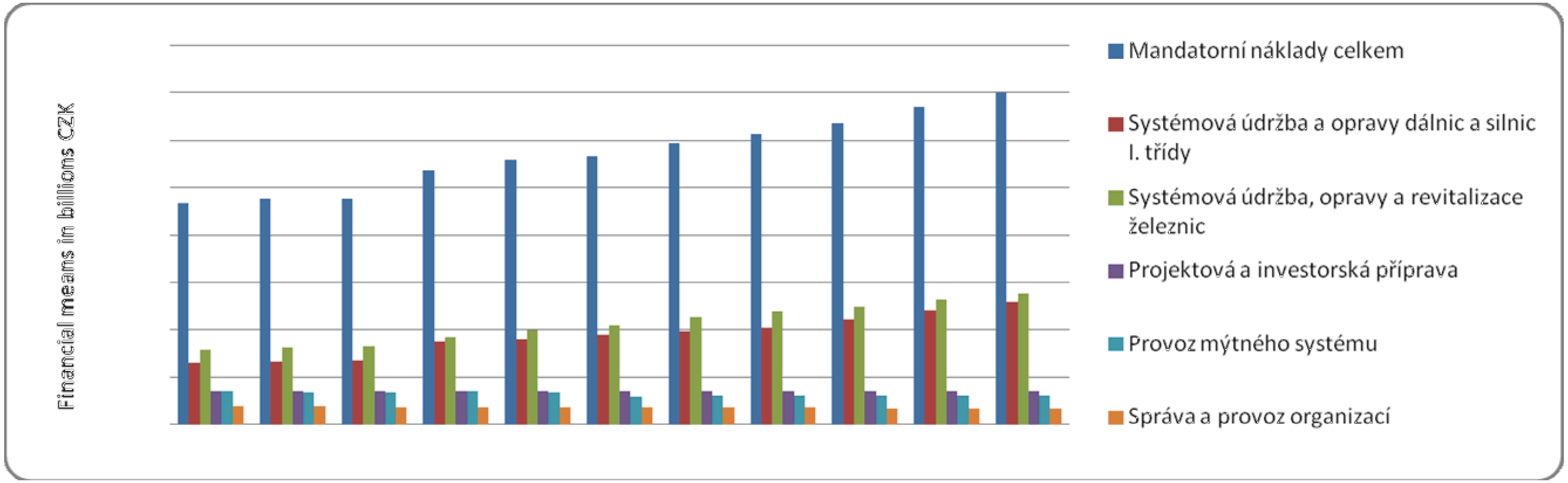


Table 58.92 – Mandatory expenditures in 2013 - 2023

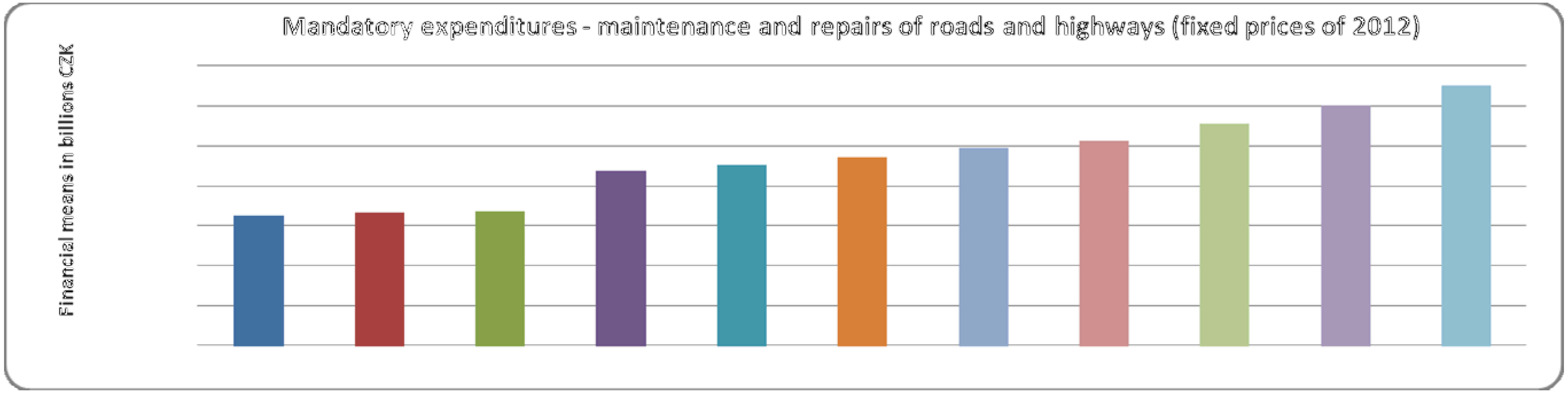


Figure 58.27 – Graph of development of mandatory costs for maintenance and repairs of roads and motorways

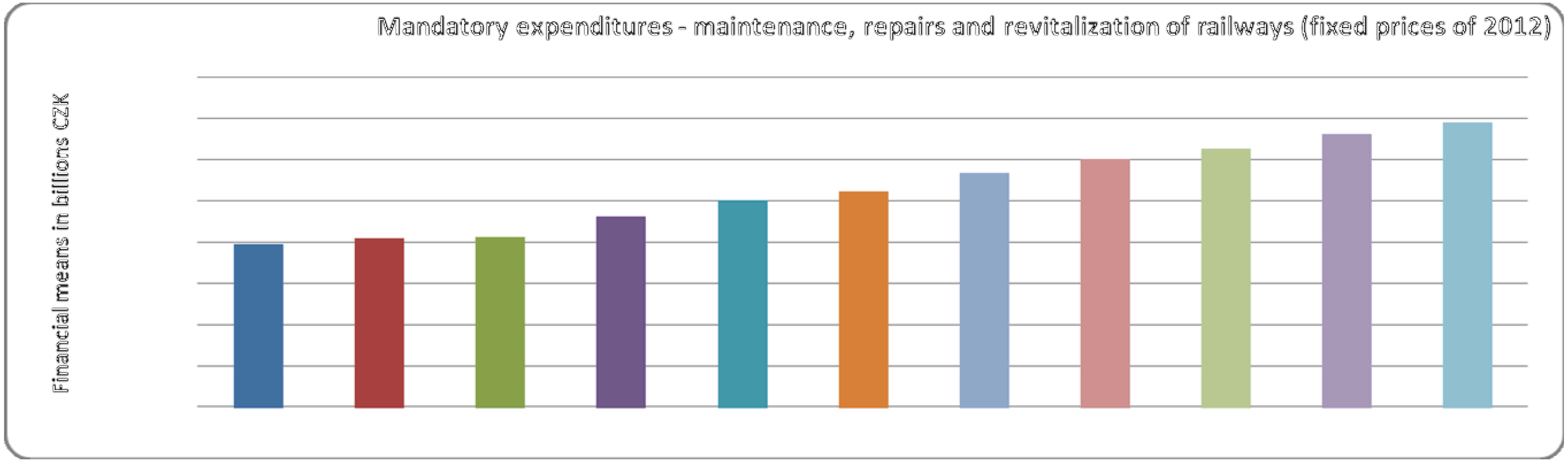


Figure 58.28 – Graph of development of mandatory costs for maintenance and repairs of railways

58.5 Solutions to implementation of development projects and suggestions

In the category of packages A.1 – A.4, there were defined - in the process of preparation of Transport Strategies - projects and suggestions (Book 6), for projects and some suggestions there were calculated investment costs (Book 7), these were subsequently - upon recalculation into building costs - the subject of the placing of the projects and suggestions into the Simulator of construction of projects, the output of which being a schedule of implementation of the Transport Strategies.

From the viewpoint of evaluation via multilevel multi-criteria evaluation (MMA) there are important development measures included in the general group of packages A. These measures are - for the purpose of assessment - included in the so called clusters of projects, i.e. coherent sets of constructions or transport routes. These measures are further divided into projects and suggestions, and in the same way are divided individual databases of measures contained in Book 6 and evaluated in Book 8:

Projects - designed infrastructure measures for which there is detailed information available, e.g. from documents that have already been drawn up. Projects are considered for implementation especially in the short-term, medium-term and/or long-term horizon.

Suggestions – Proposed infrastructure measures further not specified (e.g. in the area of technical parameters, investment and operating costs, etc.), the implementation of which may be expected usually in the long-term horizon and in the near future. With regard to the medium-term horizon, suggestions are considered in terms of their further preparation if meaningfulness of their implementation according to the principles of economic return is justified. Only in cases of problem-free project and proprietary preparation or such that is procured speedily but in a high quality, there may be also considered implementation of suggestions in the period by the year 2020.

Package	Item	Investment costs (billion CZK)[21] (Fixed prices of the year 2012)
A.1	Development of motorways, expressways and Class I roads.	760
A.2	Development of the railway infrastructure	950
A.3	Development of the infrastructure of waterways	24.0
A.4	Development of the air transport infrastructure	8,7 (not paid by SFTI)

Table 58.93 – Financial costs of development packages identified in Book 6.

Investment costs also include costs of project and preparation referring to proprietary rights which, however, are earmarked separately (see chapter 4.4), and in the schedule of the implementation of Transport Strategies only building costs and costs directly relating to the construction are allowed for.

Apart from the above-mentioned packages - which financial coverage will be secured within the scope of allocation of a preponderant part of available financial resources on the basis of results of transport modelling and multilevel multi-criteria evaluation in Transport Strategies - there are also proposed four more financial packages for measures associated in clusters which could not be the subject of transport modelling - the so called project packages. The purpose of creation of project packages being to enable implementation of measures which could not be the subject of multilevel multi-criteria evaluation or to enable implementation of measures with which the assessment within the scope of MMA does not provide a sufficiently credible picture of need of their implementation due to adjustment of parameters of methods of MMA. Content of these project packages follows from previous Books. To these additional financial packages there was allocated a particular amount which is included in total available resources for the funding of new investments in transport infrastructure. Development measures which were not the subject of transport modelling, MCA and CBA were joined into project packages Junctions, Ports, Intersections and Bypasses and relocations of class I roads for which there is proposed annual allocation in the total amount of CZK 105 billion for the period of 2014-50 (it concerns a part of investment costs from a number of all identified measures - see Table 58.95 – Project packages in the group of packages A).

[21] It concerns those projects or suggestions with which there were quantifiable expected investment costs. However, in many cases, especially in the area of railways - the investor submitted such suggestions with which it was not possible to objectively determine the amount of costs due to absolute absence of any detailed information about such suggestions - oftentimes their preferred version is not even known. Therefore, it is necessary to further elaborate the individual suggestions (in the area of roads and railways) and to justify especially their technical-economic parameters according to the principles contained in this Transport Strategies, and to further elaborate the suggestions with a potential, and in case of further update of the Transport Strategies to repeatedly evaluate along with other projects about which the information is already known at this time.

Project package		Allocated annual funds according to the Proposal variant (billion CZK) (Fixed prices of the year 2012)		
		2014 -2020	2021 - 2035	2036 - 2050
ad A.2	Railway junctions	1,85	0,50	0,50
ad A.3	Quay	0,15	0,15 -> 0	0
ad A.1	Intersections on D + R	0,15 -> 0,20	0,20 -> 0	0
ad A.1	By-passes and relocations of Class I roads	1,85 -> 2,0	2,0	2,0
Arrow (->) means a trend of expenditures in the given period.				

Table 58.94 – Project packages in the group of packages A - annual funds.

- Package Railway junctions serves for the securing of financial coverage of implementation of some railway junctions from national sources, for completion of railway junctions - primarily on already implemented sections of railway corridors - proved to be very necessary. Nevertheless, it is probable that within the framework of drawing up annual investment plans - SFTI budgets, significant railway junctions will be also included in the period of 2014 - 2020 for the co-funding from the EU funds - a principle of mutual interchangeability of sources if enabled for such sources by conditions stipulated.
- Package Quay is intended for the financing of projects supporting implementation of small projects for recreational navigation in case that obtainment of funds from the Integrated Operational Program for the implementation of these measures - within the framework of support of tourism - would not be successful and if at the same time efficiency of their implementation was proved.
- The first project package for road constructions being a package "Intersections on D+R". Package for the implementation of intersections on D+R is singled out due to provable benefits of the construction of new MÚK at the place where new concentration of important economic activities is planned and where at the same time any other nearest MÚK is not utilizable. Concurrently, a necessary condition for preference of individual measures is expected to be willingness of the investor to at least partly participate financially in the implementation of the required MÚK. At the same time there must be observed parameters of safety and continuity of traffic within the meaning of ČSN 73 6101 – designing of roads and motorways. In addition to construction of new MÚK the rebuilding of existing and from safety perspective not satisfactory grade-separated intersection can be reimburse from this package.
- **The second fundamental project package in the area of roads being a package "Bypasses and relocations of class I roads“**. Financial coverage for satisfaction of needs of users and transport-affected inhabitants on class I roads besides TEN-T is generally the biggest negative aspect of the

Proposal variant of funding, for available sources for such measures are highly insufficient - with respect to such defined resources - for the coverage of the implementation of all necessary measures. Within a period by the year 2020 it is possible to utilize only ERDF sources and sources from this project package for the implementation of measures on class I roads. **The fact is that in case of road constructions on class I roads besides the TEN-T network there is not secured source coverage for the implementation of all those projects which may be considered to have high priority.** To satisfy the need of faster development of class I roads, it is advisable to strive, within the nation-wide debate on the amount of the ERDF share for individual OP, for a considerably higher share. The amount of ERDF sources stated in the Proposal variant of financing needs to be considered to be the absolute minimum. A higher ERDF share for OPD II would then enable more measures to be implemented on class I roads where the financing needs are insufficiently covered to a considerable extent in the Proposal variant of financing. Among measures on class I roads, there belong those which were not modelled (not having zCBA evaluation nor any bands of evaluation), but also part bypasses of smaller places which were modelled, but their importance is purely local and in the strategic transport model their effect could not be fully assessed. These measures were further classified - from the viewpoint of their importance - according to results of the 1st and 2nd pillar of MMA, but there was also taken into consideration a type of communication according to classification carried out within the scope of Report Z.6.1, and with bypasses also their importance from the viewpoint of classification into groups created during works on the same Report. Within the framework of assessment of their possible implementation into the schedule of the implementation of Transport Strategies with secured financial coverage only in the extent of the Proposal variant of funding, there were further taken into account factors, such as the state of their preparedness, but also their function in the transport system from the viewpoint of continuity with respect to further measures, even from the viewpoint of time. For instance, measures on the existing I/3 road will have the main benefit in the period before putting D3 motorway in the territory of the Central Bohemian Region into operation, and therefore it is purposeful to implement them in the shortest possible time, for commencement and completion of the construction of this part of D3 motorway cannot be expected - with the amount of sources according to the Proposal variant of funding - earlier than in the period of 2020 - 2035. Similar being - for instance - a case of construction of I/16 road in the section of Slaný - Velvary in relation to sections of Pražský okruh /Prague Ring Road/ 518 and 519. However, it must be said that concrete measures included into this package may be implemented in practice only in case of proving their economic efficiency through detailed assessment. On the basis of results of these detailed analyses (prepared for instance as an annex to the project plan) there may occur - in future - operative changes within the scope of the list of these measures, or part time shifts in the implementation thereof.

Project package		Cumulative costs in the periods according to the Proposal variant of funding (billion CZK)		
		2014 -2020	2021 - 2035	2036 – 2050
ad A.2	Railway junctions	13,0	7,5	7,5
ad A.3	Quay	1,1	0,8	0
ad A.1	Intersections on D + R	1,1	1,0	0
ad A.1	By-passes and relocations of Class I roads	13,0	30,0	30,0

Table 58.95 – Project packages in the group of packages A

Defined measures for satisfaction of the need of development of transport infrastructure are contained in Book 6. In Book 8 there is - with clusters which were modelled in terms of transport - carried out evaluation; with the evaluated clusters there is determined their order according to the achieved band of evaluation which was drawn up on the basis of achieved results in all three pillars (transport-social, environmental and economic) and achieved points (scale 1-10). With clusters where there could not be carried out economic evaluation, the order is determined only on the basis of results of the transport-social and environmental pillar and achieved points.

With many suggestions it was not objectively possible to calculate expected investment costs. In many cases, especially in the area of railways - the investor submitted such suggestions with which it was not possible to objectively determine at present the amount of costs due to absolute absence of any detailed information about such suggestions - oftentimes their preferred version is not even known, but only a name and purpose a theoretically given suggestion could serve for. Therefore, it is necessary to elaborate individual suggestions in the area of roads and motorways, but mainly in the area of railways, in more detail and to justify particularly their technical-economical parameters according to the principles contained in the Transport Strategies. Subsequent step being elaboration of potentially effective suggestions into more details so that these suggestions could be repeatedly evaluated in the next update of the Transport Strategies along with other projects about which the information is already known at this time.

Defined **clusters on the railway network** evaluated in Book 8 reach the number of 146 sets of constructions (the total of 423 measures of which a number of them is not classified into clusters) with the total identified investment costs of approx. 950 billion CZK. In relation to this total financial resources, however, there applies the said above. The subject-matter of full evaluation in Book 8 being only clusters containing projects. For partial financing of non-evaluable railway junctions there was proposed an additional package Railway junctions. In the issues of high-speed lines, or lines of fast connections, there must first take place verification when the construction of VRT/RS may be commenced and in what extent. Lack of supporting documents for the evaluation of these suggestions on the side of RIA results in situation when it is not possible to include them in the Transport Strategies even if they could be necessary and efficient, which subsequently leads to further postponement of preparation and subsequently to postponement of the implementation of concrete projects. Without a key change in this approach under the supervision of MoT) one cannot expect any considerable change in future, either.

Road clusters were evaluated in the number of 264 and contain 354 projects and 261 suggestions. There were mutually assessed variants of clusters observed by investors, supplemented by the consultant, created from proposals of citizens' associations and NGOs or capacity-optimized proposals (KON) proposed by the consultant of the Transport Strategies. After the analysis of variants, there were recommended for implementation clusters containing constructions of motorways at 90 billion CZK of investment costs, constructions of expressways at 310 billion CZK, and constructions of class I roads at 330 billion CZK of which 135 billion CZK goes to measures which were not the subject-matter of transport modelling. Capacity-optimized proposal (KON) being an indication for verification of parameters of the prepared structure in a separate process, this issue is dealt with in detail - with individual measures - in Chapter 7. Reason for such verification of selected projects is especially not corresponding proportion of costs and benefits of implementation of the given measure in the form expected by the investor in a drawn-up database of measures.

Concrete mode of verification of measures KON will be decided in practice individually for individual projects in dependence on the level of preparation and other related circumstances.

Road constructions are divided into "capable of being modelled" and "not capable of being modelled" among which there are, for instance, bypasses of small places, part relocations, but also selected measures in localities where the strategic transport model cannot be too exact (e.g. agglomeration of big towns).

With **constructions on waterways** there was put 89 projects into the plan (including projects of recreational navigation) in 6 clusters with the total investment costs of 24 billion CZK. From sources of the Ministry of Transport it is necessary to implement primarily those measures which contribute to improvement of navigation conditions for bigger freight ships.

Within the framework of Transport Strategies, there was not evaluated the Dunaj – Odra – Elbe canal, for its theoretical implementation or commencement of factual project and investment preparation and preparation referring to proprietary rights must be preceded by many separate administrative steps. Particularly, it concerns preparation of a comprehensive feasibility study which should prove whether the project is or is not economically efficient and whether the funds invested in its preparation and subsequent implementation have a potential return. In case of positive results of this evaluation, there must follow separate SEA evaluation of this suggestion which must be - within the meaning of Act No. 100/2001 Sb. (Coll.), on assessment of influences of construction on the environment - considered as a separate concept. Only in case of proving an economic benefit and obtainment of a positive opinion of SEA, it will be possible to commence project and investment preparation and preparation referring to proprietary rights of this suggestion with concurrent assessment of feasibility of financial securing of this investment within considered time horizons.

58.6 Rules of allocation of financial resources for development measures

Not all identified available sources for financing TI are freely utilizable for the funding of any needs within the scope of maintenance and development of TI. This particularly applies to resources from EU funds which are intended nearly solely for development of TI. Moreover, for projects financed from EU funds it is necessary to secure relevant national sources for the co-funding thereof.

Possibility of use of expected sources of funding for individual transport modes may significantly influence institutional arrangement of the transport sector. With respect to the fact that the future development of institutional arrangement is not known up to now, other national funds are considered here as a whole, with possible use for the funding of any identified needs. Below, there are described proposed rules for allocation of financial resource:

Step 1 Possibility of use of the resources from EU funds for the funding of TI (OPD I, OPD II, FS, ERDF, CEF)

Operational program Transport 2007 – 2013 (**OPD I**) enables, with the use of rule n+2, funding of investment projects even in years 2014 and 2015. OPD I resources comprise resources from the Cohesion Fund and ERDF, see herein under. Need and possibility of using up allocation of OPD I overlap with the medium-term proposal period of Transport Strategies 2014 – 2020. Using up allocation of OPD I in the years 2014 and 2015 must be considered to be of priority. Therefore, within the framework of the schedule of implementation of Transport Strategies it is also allowed for the implementation of these projects. At the same time, it concerns projects which were - in most cases - part of assessed clusters which - within Book 8 - proved to be important; or rather it concerns measures for those parts of the infrastructure which are important from the viewpoint of their transport importance. With part of big projects of OPD I which will not be successfully completed by the end of the year 2015, it will be necessary to use a possibility of their phasing - i.e. construction of the coherent phase of the project with the funding from OPD I and completion of the construction of the remaining phases of the project with the use of resources of FS under OPD2 in the period starting with the year 2016 or with the use of national sources according to current budget possibilities of the given years.

Cohesion Fund – CF /FS/ will constitute in the period of 2014 – 2020 a major part of available EU funds for the CR under OPD II. It will be possible to finance projects on the whole Trans-European transport network (core and comprehensive TEN-T network), in case of railways it is possible to also finance projects outside of TEN-T. Effective rate of the proportion of the EU resources is expected, on the basis of experiences from 2007 – 2013, in the amount of 70%, i.e. need of national resources for the co-funding in the amount of 30%.

European Regional Development Fund – ERDF is another of the EU funds the sources of which make a part of OPD I, or will be a part of OPD II. It can be used to finance development of any transport infrastructure, also outside the TEN-T network, including transport infrastructure projects to support tourism and recreation.

To satisfy the need of faster development of class I roads, it is advisable to strive, within the nation-wide debate on the amount of the ERDF share for individual OP, for a considerably higher share. The amount of ERDF sources stated in the Proposal variant of funding needs to be considered as the absolute minimum. A higher ERDF share for OPD II would then enable more measures to be implemented on class I roads where the financing needs are insufficiently covered to a considerable extent in the Proposal variant of financing.

The table below summarizes predictions of possible financing sources from the EU funds for subsequent programme period of 2014-2020. According to the up-to-date information from May 2013, about 125 billion CZK (using the current rate of 2.5 CZK/EUR) could be available for the Czech Republic from the EU funds to be used in the transport sector. In case the CZK/EUR rate does not strengthen (contrary to the long-term prediction of MF), it will mean the possibility to implement a slightly higher degree of investment projects than as matched with the available financing resources according to the Proposal variant of financing which is however based on the long-term prediction of MF. To eliminate the risk of exchange rate development, it is therefore substantial for complete exhaustion of all earmarked funds to start preparation of large projects, including “substitutive” projects, in time so that a sufficient absorption capacity is secured for all projects that will not be open to doubt when discussed with DG REGIO. For this purpose, it is necessary to accelerate procedures aiming at quality preparation of key projects according to the results of their comparing done under the Transport Strategies.

Connecting Europe Facility – CEF, which is newly being created, will serve the possibility to finance projects of the core TEN-T network in railway and waterway transport. In the case of road projects, they must have the cross-border character. The cohesion part of CEF in the value of 10 billion EUR (about 1/3 of the total CEF budget), that has been transferred from the Cohesion Fund, representing one of the most important innovation of the future programming period 2014-2020. The resources from the cohesion part of CEF will be divided on the basis of national envelopes to the Member States eligible for financing from the Cohesion Fund. The conditions for drawing the national share will be governed by the conditions stipulated in this fund. The efficient rate of support for the remaining part of the CEF budget, i.e. for the non-cohesion part of CEF, will be significantly lower depending on the type of a project (20 % to 40 %). Despite that, it is advisable that the Czech Republic strive for those funds too. The CEF funds will not be a part of OPD II.

European Regional Development Fund – ERDF is another of the EU funds the sources of which make a part of OPD I or, as the case may be, will be a part of OPD II. It may be used for the funding of development of any transport infrastructure, even outside of the TEN-T network, including projects of transport infrastructure for support of tourism and recreation.

In the table below there are **summarized prerequisites of possible sources of funding from the EU funds for subsequent program period of 2014-2020.** According to current information from May 2013, the Czech Republic could have at its disposal the total of up to approx. 125 billion CZK (according to the current exchange rate: 25.8 CZK/EUR) from the EU funds for the use in the transport sector. The definite allocations between individual operational programmes within ESIF (European Structural and Investment Funds), under which the allocation for the Operational Programme Transport 2014-2020 will be definitively allocated (both in the part co-funded from the Cohesion Fund, and in the part co-funded from ERDF), will be determined after the discussion on the content of individual OPs has been closed and consensus over any unclear items of the Agreement on Partnership, which can be definitively approved after respective directives have been adopted by the European Parliament, has been reached. Undoubtedly, conclusions from the Council concerning EU funds, which should be held in September 2013, will be significantly reflected in this allocation. The main criteria, according to which the definite allocations should be determined, are, according to the MLD, the distribution of allocations in the current programming period (2007-2013), parameters determined by the new legislative framework, utilization of new forms of implementation, measurability of interventions, existence of the intervention logic, and compliance with the principle of functioning market and the quality of underlying strategy. The definite approval of the allocation for the Operational Programme Transport 2014-2020 at the national level will represent approval of this Operational Programme by the government that should take place in December 2013.

	CEF		OPD 2014 - 2020		IROP
	European	Cohesion	Cohesion Fund	ERDF	ERDF
Available source - CR	26.5 billion CZK (cohesion part, envelope 2014-16)		87 billion CZK*	10 billion CZK**	1.5 billion CZK
Amount of EU subsidy*	20-50 %	60-70 %	70 %	70 %	70 %
Subject of subsidy	Only Core TEN-T on the railway and water	Only Core TEN-T on the railway and water, in case of roads only cross-border sections, by 2016 a national envelope, afterwards a competition between cohesion states	Comprehensive and core TEN-T, railway outside of TEN-T, MHD	Transport projects outside of TEN-T, support of connection to TEN-T network of tertiary and secondary junctions	Support of tourism - projects of recreational navigation

** Expectation of a EU funds which will be available for the funding of DI dealt with within the framework of Transport Strategies, using the current rate of 25.8 CZK/EUR (May 2013).*

*** In the case of ERDF, it is advisable to strive for a considerably higher share within the national debate on the amount of the share for individual OPs. The stated ERFD funds must be considered to be the absolute minimum. A higher share of ERDF for OPD II would then enable more measures to be implemented on class I roads where the financing needs are insufficiently covered to a considerable extent in the Proposal variant of financing.*

Table 58.96 – Possible sources of funding of DI (EU funds)

In case that the exchange rate CZK/EUR does not strengthen (in conflict with long-term prediction of MF), it will mean a possibility of implementation of a slightly increased volume of investment events than is matched to available sources of funding according to the Proposal variant of funding which is based just on the long-term prediction of MF. Due to elimination of the risk of development of a rate of exchange, it is essential for using up all earmarked funds that preparation of big projects be timely commenced, including substitute projects so that sufficient absorption capacity of projects which will not be open to doubt in negotiation with DG REGIO is secured. For this purpose, there must be accelerated procedures leading to quality preparation of key projects according to results of their comparison carried out within the framework of the Transport Strategies.

With resources from the cohesion part of CEF it is expected that 25% will be used for road constructions of a border character (of which 5% for ITS) and 75% will be used for waterway constructions and railways. By the end of the year 2016, the Czech Republic will be able to make use of the funds in the amount of 1 billion EUR which will be earmarked for it within the framework of the so called national envelope; the remaining financial resources which will not be allocated on the given data will be then competed for among cohesion states on a project basis. In the proposal of allocation of financial resources to concrete projects in the following chapters of Book 10, there is not allowed for - due to uncertain guarantee - the profit of funding from CEF besides allocations in the national envelope, nevertheless it is desirable to pursue such funds. It will be desirable to also pursue resources from the European part of CEF, even knowing that the proportion of EU funding with respect to such projects will be significantly lower than in case of a cohesion part and that the given projects will have to stack up to the competition of projects from the remaining EU member states.

Process of acquisition of Transport Strategies clearly proved - in the medium-term horizon - a need of higher allocation of financial resources to development of a road network with regard to a considerable amount of inhabitants today directly affected by transport on fully utilized class I roads passing through communities. Allocation of sources from FS and ERDF, however, must respect the allocation according to the Operational Programme Transport for the years 2014-2020, which **initial proposal** proceeds primarily from objectives defined from the EU level and expects division of the EU sources among types of transport infrastructure as follows:

- priority axis 1 – railway + water + multimodal transport+ traffic management + development of low-carbon transport systems 49.1 %
- priority axis 2 – motorways and roads of TEN-T 39.6 %
- priority axis 3 – motorways and roads outside of TEN-T 10 %

Reason of the given division being a primary need to support from the EU level ecological types of transport and thus to help to achieve the objectives of the European transport policy which, however, will not manage and cannot encompass either the specifics of individual member states. With respect to the fact that within the above-defined axes also fall railway investments - from the viewpoint of satisfaction of needs of users and securing elimination of influences outside of transport infrastructure considered within Transport Strategies - in the planning of financial resources there is not allowed for the total expected resources allocated from FS and ERDF for the period of 2014-2020 for the Czech Republic. In the scenario - if there does not occur any strengthening of the rate CZK/EUR - there would be possible to make use of the total of up to 87 billion CZK from the Cohesion Fund and 10 billion CZK from ERDF for development of class I roads outside of TEN-T.

In the case of ERDF, it is advisable to strive for a considerably higher share within the national debate on the amount of the share for individual OPs. The stated the ERFD funds must be considered to be the absolute minimum. A higher share of

ERDF for OPD II would then enable more measures to be implemented on class I roads where the financing needs are insufficiently covered to a considerable extent in the Proposal variant of financing.

Especially, for railway and waterway projects + border road sections of the core TEN-T network there is expected use of resources of CEF primarily from its cohesion part within the framework of the national envelope. CEF resources will not be part of the operational programme Transport 2014 – 2020. By awarding a considerably higher allocation from CEF to railway and waterway projects there de factor occurs - within the scope of the given division - stronger preference of these projects over road projects (in the total financial expression of the EU proportion). However, it will be desirable to also pursue resources from the European part of CEF, or to compete for resources from the cohesion part of CEF which the individual states will not divide among themselves within the scope of the national envelope. Part of them may be used for needs identified in the group of packages B and in project packages according to the principle of mutual interchangeability of allocated sources in case that their purpose enables it. Some projects of recreational navigation could be, moreover, co-funded from ERDF via the Integrated Regional Operational Program (IROP). Such resources in total being - currently known (May 2013) - considered in the amount of 1.4 billion CZK.

Commencement of projects within the program period of 2014-2020 is conditioned primarily by the date of approval of operational programs, or by announcement of concrete calls for submission of applications for resources from CEF, including concrete conditions for eligibility of expenditures of projects which will be implemented within the scope thereof.

Step 2 Earmarking national resources for the European co-funding

With all EU funds we expect a flat-effective rate of co-funding of 70% as a lump sum on the basis of experience from 2007 – 2013. With the European part of CEF the EU co-funding will be lower, and also with measures where there is expected a higher yield, e.g. from tolls, there is considered lower co-funding. The remaining funds up to the amount of 100% must be earmarked from national sources. Need of the national sources for co-funding projects is particularly big in the years 2014 and 2015 when there is an overlap of two program periods with regard to the drawing of the EU funds. If the sources for the co-funding from the state budget are not definitely secured, there is proposed in Book 9 use of debt financing payable from own sources of the Transport Ministry. However, involvement of debt financing is not allowed for in the Proposal variant of funding contained in this Book 10, nevertheless it concerns an appropriate instrument, for the price of the debt financing will be balanced by benefits from continuous start-up and profile of the implementation of EU funds in the period of 2014-2020.

Step 3 Earmarking funds to groups of packages B, C, D (maintenance and repairs, development of ITS, etc.)

Identification of financial resources for implementation of packages of measures was the subject of Book 7 and these are summarized in the previous chapter. Above all, the emphasis is put on the securing of funds for sufficient and quality maintenance and repairs of the existing network. Most of these measures will have to be financed from national sources, nevertheless, as already mentioned above, there is a possibility to implement part of the group of packages B (or D) with a subsidy from the EU funds. Against ideal needs for maintenance and repairs as follow from results of previous Books, there occurred - with regard to objective circumstances (contrast of objectives and available resources according to the Proposal variant of funding) mitigation of the profile of growth of funds for these packages in time (administrators of transport infrastructure must be able to absorb such increase and use in an effective manner). Amount of allocation to individual packages in time is contained in a simplified form in part 4.4.

Step 4 Selection of projects for the financing from project packages Quay, Railway junctions, Bypasses and intersections

Financial resource for the implementation of non-evaluated projects will be used from allocated funds in newly supplemented the so called project packages, but also from sources for the group of packages A after the putting of these cluster into logical relations or due to their evident and objectively justified need in relation to outputs of other Books of Transport Strategies.

Step 5 Allocation **of financial resources for development of DI according to transport mode**

In the period of 2014 – 2020 there will be proceeded primarily according to EU rules for individual funds while respecting predominance of railway projects. For division of **national sources** in all three periods, there is proposed in the strategy for free national sources for the period of 2014 - 2020 a compensation proportion Road : Railway : Water 60 : 35 : 5, which equalizes higher allocation to railway and waterway projects in the EU funds and takes into consideration a need to complete construction of the road core network of TEN-T by the year 2030, and at the same time - even though still in an insufficient extent - to secure necessary measures on the network of class I roads outside of TEN-T. The result being a proportion of road projects in the period of 2014 – 2020 in the amount of 44%.

With regard to approx. five times higher transport performance carried out in the Czech Republic on the road infrastructure, and the fact that fundamental sections of the network of motorways and expressways is still missing, the optimum division among modes should approximate the rate of 83 : 15.5 : 1.5 in favour of roads. However, for a higher proportion for railways speaks lower emission production and noise burden arising from railway transport and also an emphasis on the support of development of railway transport given by the European and the Czech transport policy.

Although, evaluation of the project as contained in Book 8 enables - with regard to compatibility of methods for road, railway and water measures - direct comparison, such result is not entirely objective and the question arises whether simple comparison of sections of various modes brings answers to the question of priorities of modes. Impact of the implemented measures will be shown only on the whole routes (clusters) or compact corridors and motorway routes. Strategy is therefore focused on the implementation of compact sets of constructions which will bring substantial improvement of the infrastructure within a short period. Actual allocation of financial resources to types of transport infrastructure may be variable in individual years and will proceed from actual preparedness of measures for the implementation and from actual availability of sources.

Overall a lower need of financial resources for the implementation of key railway projects in the medium-term horizon thus enables - unlike the area of road transport - to satisfy a higher amount of indicated needs within a period by the year 2020.

Within the scope of the TSS project two working variants of allocation of funds among types of transport were prepared:
Variant 1: Continuation in allocation according to OPD II[22]:

- Roads: 49.6 %
- Railways: 46.5 %
- Waterways: 2.6 %

Variant 2: Allocation according to transport performances in the horizon of 2020, 2035 and 2050:

- Roads: 83.0 %
- Railways: 15.5 %
- Waterways: 1.5 %

After detailed assessment of work-assigned projects via the Simulator of construction of projects it was ascertained that in case of variant 1 there would be built up - already in the period of 2014 - 2020 - most preferable and necessary conventional railway and water projects, on the contrary, from road projects there would not be even completed implementation of entirely fundamental measures indispensable for reduction of current highly negative impacts on the environment and in particular on public health in cities burdened today by transit road transport.

In case of division according to variant 2, there would be satisfied by the year 2020 (2023) a higher part of needs to the extent of class I roads, however, it would not be concurrently possible to implement on the railway all measures for completion of corridors, securing interoperability and efficiency improvement of operation management.

[22] The remainder completing the sum of 100 %, i.e. 1.3 % is the prediction of allocation for the Technical Assistance OPD II.

After consideration of results of working simulations of construction, the following **proportion of division of national sources for period of 2017 – 2020** not attached to the co-funding of EU sources was proposed. According to that there were allocated resources to individual projects within the scope of the schedule of the implementation of Transport Strategies:

- Roads: 63.5 %
- Railways: 35.0 %
- Waterways: 1.5 %

The total assumed allocation of all the resources earmarked for development measures under package category A for 2014 – 2020 (2023) in constant prices is as follows:

- Roads: CZK 180 billion (47.8%)
- Railways: CZK 181 billion (48.1%)
- Waterways: CZK 15.45 billion (4.1%)

It concerns a proposal of allocation, actual allocation will depend on preparedness of individual investors and their projects for the implementation in the given years. Actual allocation may be different in each year, according to actual priorities, procedure of preparation and possibility of use of funds and within the scope of individual modes there will be put an emphasis on maximum possible respecting of necessity of projects according to Book 8. In the period after the year 2020 there may occur different allocation of sources to modes than is expected at present, for into the update of Transport Strategies there will enter, especially, detailed railway suggestions which may be a serious reason for a change in an approach to allocation of available national sources.

Step 6 Allocation **of financial resources possibly beyond the scope of the Proposal variant of funding.**

Within the cross-departmental comments procedure, the Ministry of Industry and Trade submitted a fundamental comment concerning the requirement for an alternative variant of financing that would count on a higher degree of national sources because the Proposal variant of financing according to the submitted opinion does not sufficiently contribute to the possibility to meet the objectives of the Strategy of the International Competitiveness of the Czech Republic for the Period of 2014 – 2020. The Ministry of Transport fully identifies itself with this opinion. Therefore the principles for steering the possibly increased degree of financial resources are described in the following chapters.

When the degree of resources is increased as compared to the Proposal variant of financing, it is absolutely essential for the increase not to be just one-time but to be guaranteed in the budget forecast because in the case to the contrary it is not possible to guarantee that launched projects will be financially covered in the following years. The approach when one-time increase was allocated only for the upcoming year would not be very conceptual and would represent a considerable risk from the point of view of the strategy sustainability..

In the period of 2014 - 2020, possible financial resources – allocated beyond the scope of the Proposal variant of funding - should be directed mainly into development of the road network, for the deficit in financial coverage of needs is highest just with this part of the network and limits fulfilment of needs within the time expected by all society. With this segment of the network, the principle of allocation of financial resources beyond the scope of the proposal variant is recommended to be governed by principles contained in chapter 60. Recommended prioritization of projects in case of allocation of funds beyond the scope of the Proposal variant of funding in the period of 2014 – 2020 is contained in chapter 61.1.

To satisfy the need of faster development of class I roads, **it is advisable to strive for a considerably higher share within the national debate on the amount of the ERDF share for individual OPs**. The the ERFD funds stated in the Proposal variant of financing must be considered to be the absolute minimum. A higher share of ERDF for OPD II would then enable more measures to be implemented on class I roads where the financing needs are insufficiently covered to a considerable extent in the Proposal variant of financing. It is also desirable to make use of the fudns allocated beyond the scope of the Proposal variant of funding for removal of accident places, solution of emergency situations, improvement of parameters of unsatisfactory important sections, even in case of the road and railway network.

Proposal variant of funding	Expected resources in total									
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Total sources (national + EU)	65,7	72,0	69,9	69,1	69,0	70,1	69,6	70,9	68,9	67,7
National funds for the coverage of mandatory costs	23,8	23,8	26,9	27,9	28,3	29,7	30,6	31,8	33,5	35,0
OPD I (EU proportion)	17,3	13,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
OPD II + CEF (EU proportion)	3,7	7,6	17,6	16,5	15,2	14,5	12,0	11,8	8,3	5,7
National funds for the EU co-funding	10,9	10,8	9,2	8,6	7,9	7,5	6,2	6,1	4,3	3,0
National funds (national events, project packages)	10,0	16,6	16,3	16,1	17,6	18,4	20,8	21,2	22,8	24,1

Table 58.97 –expected resources in total in the period of 2014 – 2023 and calculation of individual allocations on the expenditure side according to the Proposal variant of funding.[23]

Development of the total EU resources considerably depends on development of the rate of exchange of CZK/EUR, for with respect to reimbursement of costs there is always allowed for the current rate of CZK/EUR at the time of payment[24]. In April 2012, the rate was 25.3 CZK/EUR, whereupon it decreased to 24.4 CZK/EUR in the half of September 2012 only to repeatedly reach in April 2013 25.8 CZK/EUR. For reasons of the selected conservative approach in drawing up the Proposal variant of funding, it is more responsible to predict rather long-term strengthening of the Czech crown. It is also in accordance with the long-term prediction of the Ministry of Finance. Within the framework of matching (=pairing) available resources to individual development projects - drawing up a schedule of implementation - there was thus used an exchange rate at the level of an average of long-term prediction of MoF for the following period. With this prediction of strengthening of the exchange rate, the tying of national sources necessary for the co-funding of EU sources is even lower than in case the rate of CZK/EUR was weaker over a long period than predicted. Graphical representation of the tying of individual sources is carried out in the graph on the next page. Inter alia, to eliminate a risk of development of the exchange rate it is therefore responsible to prepare a wider portfolio of constructions than is expected according to the schedule of implementation of Transport Strategies.

[23] Source side in detail -
[24] simplified description of the issue

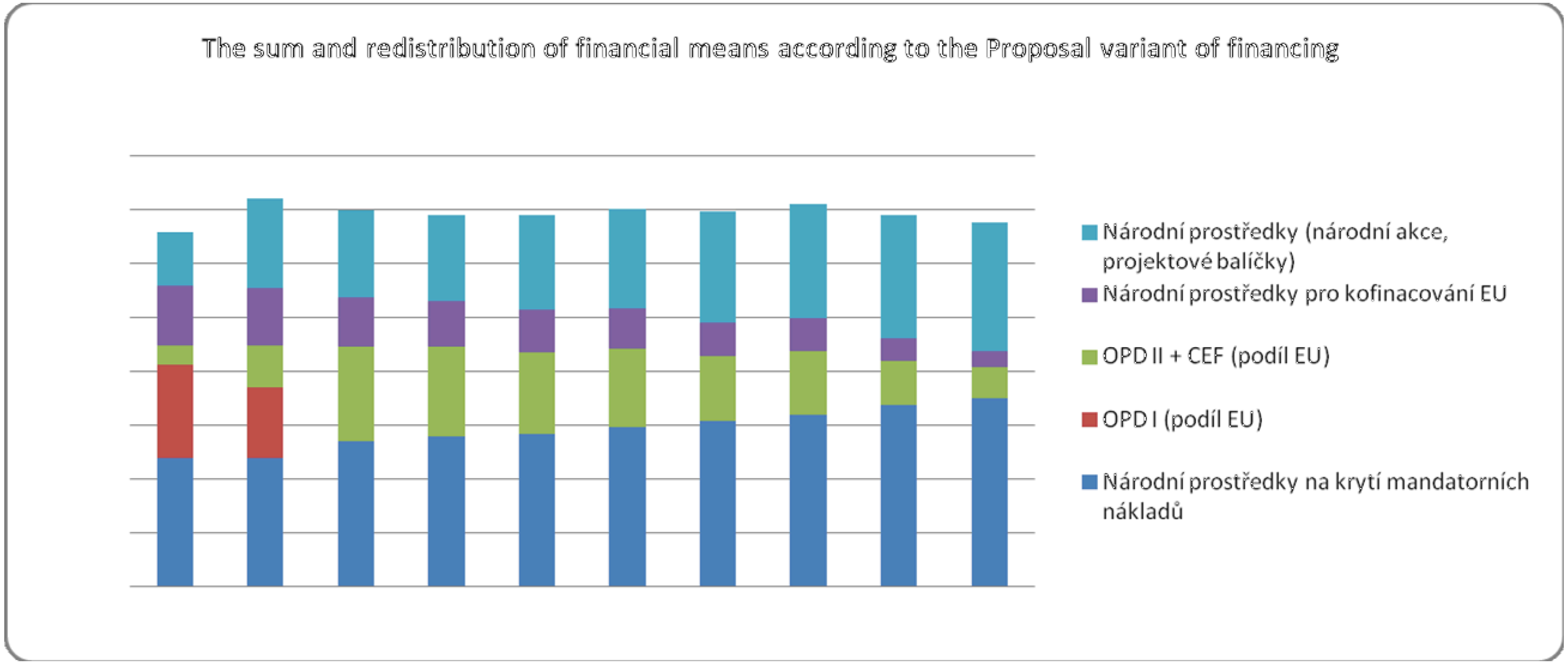


Figure 58.29 – Graph in the course of annual sources and total investments (including investment and project packages) - Proposal variant of funding

59 Securing sustainability of strategy

Transport Strategies proceed from determined principles and objectives (Book 5), defined packages of measures, analysis of bottleneck and a list of proposed development measures (Book 6), financial needs (Book 7), order of measures according to MMA (Book 8) and financial possibilities (Book 9).

A very important starting point for the drawing up of a schedule of implementation of Transport Strategies (contained in chapter 6) being areas of development plans, information from individual investors, i.e. information contained in aggregate in Book 6 and Book 7. However, for objective of mutual evaluation of clusters, it is, crucial that the information about individual projects contained in the defined clusters be at a comparable level. Unfortunately, this state was not achieved due to missing information especially with individual suggestions (especially the railway ones, see further). From this viewpoint, it is crucial for sustainability and future quality improvement of Transport Strategies that the information to individual development plans is comparable.

Prepared development plans put into the schedule of implementation of Transport Strategies must concurrently comply with stipulated conditions without fulfilment of which their future financing will not be possible. **Therefore, the Ministry of Transport - already in the course of works on Transport Strategies - adopted - during the years 2012 and 2013 - concrete measures through which there will be secured - in the future period - a responsible approach of the** Ministry of T**ransport (including investors) to prepared development plans which will subsequently become an entry for the update of Transport Strategies.**

The document Transport Sector Strategies, 2nd phase is an essential groundwork for fulfilment of ex-ante conditionality of the Transport Operational Programme for period 2014-2020. European Commission or in reality Jaspers Agency has not specified yet all conditions that have to be accomplish at latest till 2016. During the inter-ministerial observation procedure there was an agreement that further update of TSS2 will occur after termination of Transport Operational Programme for period 2007-2013, it means in 2016. In the framework of this update all new requirements for definitive fulfilment of ex-ante conditionality will be covered. This could be done for example by elaboration of the Action plan describing in detail procedure for preparation and implementation of individual measures in time (tractive studies, pre-feasibility studies, feasibility studies including CBA, risk studies, EIA and further follow – up procedures). During elaboration of TSS2 robust database of projects and suggestions were produced that will be further use with the aim to achieve following goals.

Economically efficient projects

To basic conditions of the possibility of implementation of a development plan belongs economic efficiency. Benefits including society-wide arising from the implementation of a development plan must exceed costs connected with its implementation and with its operation. These are basic principles based on objective preparation of CBA analyses with individual development plans. For this purpose, the Ministry of Transport adopted - with effect from 1/ 1/ 2013 *"Directive regulating procedures of the Ministry of Transport, investment organizations and State Fund of Transport Infrastructure in the course of preparation and implementation of investment and non-investment events of transport infrastructure, financed without participation of the state budget".* This Directive (with number V-2/2012) replaced procedures used to apply in the Ministry of Transport earlier which, as shown by history, was not entirely effective. By observance of procedures according to this directive it will be secured that preparation of a project which would be economically inefficient will not continue. Among fundamental elements of this directive ranks a duty of the investor to have a feasibility study prepared before commencement of preparation of the development plan and subsequently the so called project plan (formerly designated as investment objective/project).

59.1.1 Feasibility study

With each development plan which is not - for the time being - clearly justifiably defined, as regards the final version of a technical solution (and thus financial demandingness) in relation to generated benefits for the user, it is necessary to prepare a feasibility study. Within the framework of feasibility studies, the development plan must be seized as a functional unit (cluster) and possible technical solutions must be compared with the aim of finding such that will prove achievement of expected benefits in the necessary time. Within the framework of feasibility studies there must always be realistically evaluated risks of preparability of the given variants in time with regard to valid legal regulation by which preparation of projects in the CR is governed. Within the scope of preparation of feasibility studies it is deriving from the "Guide to COST-BENEFIT ANALYSIS of investment projects" prepared by DG REGIO of the European Commission. Within the framework of feasibility studies, it is necessary to reflect - with follow-up investment measures which relate to a concrete project recommended for early implementation – funding possibilities for their implementation in the proposal time horizon.

59.1.2 Project plan

Detailed information about a concrete part of a clearly defined development measure is contained in the so called project plan. Within the project plan there must be provably shown economic benefit for the economy of the Czech Republic. The economic efficiency of the project plan is then proven in accordance with Directive No. V-2/2012 of MoT as well as the implementing regulations for the evaluation of investments developed or approved by the Ministry of Transport. A project is approved or declined on the basis of a decision of the Central Commission of MoT. Part of the approval process according to Directive V-2/2012 being also securing a professional external examiner's opinion on individual project plans or on other materials of a fundamental character which the Central Commission discusses and approves according to this directive. On the basis of consideration of the project plans and their registration there will thus be gradually secured quality improvement of information about development plans and the situation that the costs of projects will not change at the same price level without knowledge of institutions co-responsible for their preparation, implementation and subsequently financing of own implementation. Prices will however change due to inflation.

59.2 Management of budgets intended for investment preparation

In the past, preparation of projects - from the level of individual investors - was made not according to their actual necessity. In the preparation there were preferred, especially, those projects with which preparation took place without fundamental complications and on the preparation of which it was possible to further expend financial resources . On the contrary, projects of a significant importance as confirmed by results of prioritization of projects from Book 8 were not prepared so intensively as was desirable and a solution to complications of preparation was postponed in time. However, a number of stated facts had its objective reasons, for preparation of constructions is subject to a very complicated legal regulation. As a result, for the horizon of 2014 - 2020 not all projects which were evaluated as most appropriate within Book 8 are prepared for implementation.

For this reason, the Transport Strategies must be a key binding document for individual investment organizations and also the Ministry of Transport while preferring to expend effort and financial resources on investment preparation of individual projects.

For this purpose, the Ministry of Transport adopted - with effect from 1/ 12/ 2012 *“Directive for breakdown of global items intended for preparation of constructions"* according to which the allocation of financial resources from the SFTI budget for preparation of concrete projects is governed and at the same time there is controlled 3times a year according to it - from the level of the Ministry of Transport - a procedure of investors in fulfilling defined tasks which are to be implemented on individual projects for the allocated funds.

The purpose of adoption of the directive is to primarily secure preparation of the most important events so that their preparation takes place smoothly, is not limited e.g. due to insufficient budget coverage and the procedure in the preparation is controllable from the level of the Ministry of Transport.

Within this activity, guaranteed by the Strategy Departments – Transport Analysis Unit, for each project where investment or pre-investment preparation is in progress there is an annually made plan of activities to be done if the preparation should continue. On basis of above mentioned checks of keeping this plan the Ministry of Transport gains up-to-date information on the development of individual projects and is able to certain extent influence their preparation.

59.3 Implementation of concrete measures

Implementation of concrete measures is subject to the securing of their funding, i.e. inclusion in the SFTI budget. Due to sustainability and applicability of principles of Transport Strategies in practice, it is necessary that the Strategy Department of the Ministry of Transport, or rather a department responsible for implementation of Transport Strategies, participates in discussing the SFTI budget from the beginning of its preparation to the time of its approval. It is also desirable that this department has an opportunity to express its opinion on individual proposals of budget measures prepared by investors and adopted in the course of the current year by the SFTI Committee.
Only with this procedure it is possible to professionally contribute to maximization of transfer of principles of Transport Strategies into practice, even though it is evident that with the current legal regulation of an approval process of a SFTI budget the department responsible for implementation of principles of Transport Strategies will not have a final word with respect to the form of the SFTI budget, for such form is approved by the Chamber of Deputies. However, a crucial thing is that the department responsible for implementation of Transport Strategies is able to give its professional opinion on the issue of inclusion and of financial coverage of individual measures.

Since 2011, a coordinating department - at the Ministry of Transport - cooperating in preparation of the SFTI budget being the Strategy Department upon discussion of a proposal with the Infrastructure and Structure Planning Department. Finance and Economy Department stipulates binding financial indicators in relation to consideration of a state budget. The given principles may be fulfilled without any fundamental system change.

60 Construction of strategy

In chapter 58.3 there is presented a **Proposal variant of funding** which quantifies necessary financial sources enabling fulfilment of the main objectives and observance of international obligations of the CR. From these sources are deducted financial needs of individual packages of measures (defined in Report Z.6.1 of Book 6 and financial needs defined in Book 7). Apart from need of administration, operation, and maintenance defined in Book 7, also financial needs for the equipping of transport infrastructure (groups of packages B) and for financial support of regional and local measures (groups of packages D) were allocated in individual years for the drawing up of a strategy. There were also determined allocations for the building of measures which were not the subject of transport modelling and are necessary for the functioning of transport infrastructure (reconstruction of railway junctions, construction of bypasses of small places and transport solution to through roads of class I roads via built up areas of towns, construction of quays, construction of intersections on existing motorways and expressways) - summarized in chapter 4 of this Book 10. As the result there is quantification of financial sources for the building of those parts of transport infrastructure which were evaluated by a multi-level multi-criteria assessment and by a transport model. The basic output for definition of the implementation schedule of Transport Strategies is available financial sources for building according to the Proposal variant of funding. Reallocation of sources of

the Proposal variant of funding to individual above-described packages is contained in table 4.11.
Overall, the following financial allocations - available funds are at disposal for implementation of these fundamental development measures in the Proposal variant of funding - after deduction of mandatory expenditures - in the following amount:

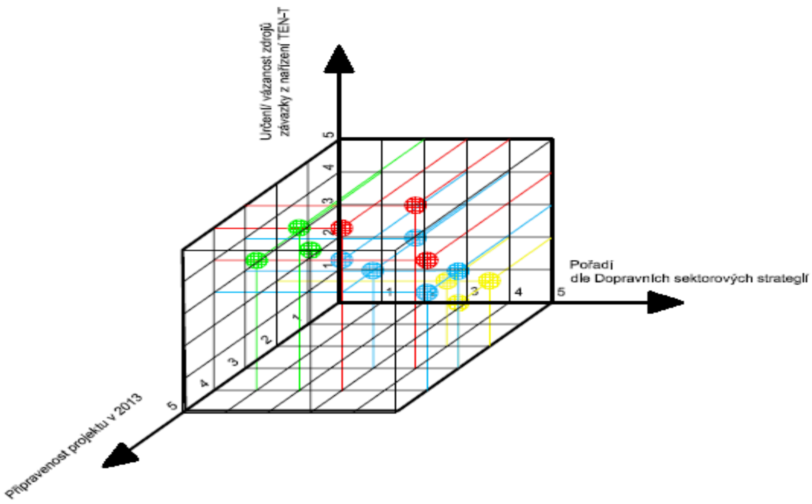
billion CZK	Total	2014-2020	2021-2035	2036-2050
EU funds + co-financing	218	179	39	-
Other national sources	2371	307	987	1077
Total	2589	486	1026	1077

Table 60.98 – Total sources of financing of DI - Proposal variant of funding, exchange rate of CZK/EUR according to long-term prediction - strengthening, fixed prices of the year 2012

Within the framework of works on Book 10 there was created the so called simulator of construction - flexible software tool by which individual available sources - according to a concrete variant of funding (here the Proposal variant of funding) - are assigned to individual concrete projects. Thus, this tool constitutes a basis for creation and subsequent continuous maintenance and evaluation of the schedule of implementation of Transport Strategies.

Allocation of resources to individual projects is controlled by the following logic:

- <u>State of preparedness in the year 2013:</u> Implementation in the short-term (2014 – 2015), or rather medium-term (2016 – 2020) horizon may be commenced only with projects which are already now well prepared in terms of investment or which preparation will be successfully completed by this period.
- <u>Priority according to Transport Strategies:</u> Projects which are of high priority according to results of Book 8, however, at the same time the state of their preparation does not enable to commence their implementation in the short-term to medium-term horizon, must be primarily prepared with responsibility so that they could be implemented as fast as allowed by the process of project, proprietary and investment preparation.
- <u>Predetermination of sources and obligations arising from TEN-T regulation:</u> Constructions are included in the schedule of implementation in the third iterative step according to individual available resources of which a greater part (of the EU source) is subject to a possibility of use only on the TEN-T network, see description of determinateness of the EU sources in chapter 9. In this step there is also taken into account a need to complete implementation of the main TEN-T network by the year 2030, or a comprehensive network by the year 2050. In this respect, a duty arising from the Proposal for the Regulation being considered as a key aspect of prioritization of inclusion in the schedule of implementation.



In green – projects OPD 1	**Preparedness in 2013:** 1 – insufficient (initiation phase of preparation), 5 – very good (prepared for selection of a contractor)
In red - CEF projects	**Order according to Transport Sector Strategies:** 1 – worst, 5 – best
In blue – projects OPD II 2014 – 2020 (FS and ERDF)	**Determination / commitment of resources, and obligations from TEN-T Regulation:** 1 – fixed-tied sources, predetermined, 5 - sources more freely distributable among projects, however, at the same time forthcoming duty to fulfil obligations from TEN-T
In yellow – projects of the period of 2020 - 2035	

Figure 60.30 – Graphical representation of the principle of allocation of sources to individual projects

In the following chapters - part strategies for individual horizons, there are proposed concrete approaches for the given time periods. For the period of 2014 – 2023 (use of rule n+3), there are stipulated schedules of construction of concrete projects and their financial coverage from individual sources which availability is expected in this period. A condition for the use of concrete EU sources for specific projects being, of course, their approval by responsible bodies at the national and European level on the basis of a submitted application. Further, for the period of 2023 – 2035 there are contained key clusters which implementation should be secured in this period with priority, and thus in the period of 2014 - 2020 there must take place their intensive project and proprietary preparation and related investment activity. For the period of 2035 – 2050, concrete clusters are not assigned to available financial sources any more, for this period it will be necessary to specify the concept of development especially in the area of railway infrastructure of VRT/RS (see a separate subchapter in chapter 7), and to determine another schedule of development of a road network on the basis of evaluation of effects of actually implemented measures.

Preparation of constructions is influenced by a considerable amount of risks which may lead to non-completion of preparation of essential projects within the expected time, which subsequently significantly influences the schedule of implementation of Transport Strategies. On the side of the investor, a special emphasis must be put on precise preparation of such projects.

Schedule of implementation of Transport Strategies may be concurrently influenced considerably by the state when there comes to release of other financial resources for the implementation e.g. in case there are achieved - within the scope of public contracts for implementation of a structure - other savings in building costs against the expected price of the investor. Of course, there cannot be excluded an opposite scenario when with individual measures there may be approved - at the level of the project plan - a more investment-demanding variant than is expected by the investor at present in supporting documents from which the Transport Strategies follow.

For the purpose of elimination of such risks and with regard to the need of completion of the TEN-T network within required periods, it is necessary to prepare projects in a larger extent than are available sources intended for their implementation in the medium-term and long-term horizon. By this approach, there may be applied a principle of possible mutual substitution of projects in the medium-term horizon in case that the given risks occur. However, in case of mutual substitution of projects, the substitute project must always represent a solution of some of priority needs identified in TSS2. These projects - in case that the given risks do not occur - would be implemented in a later period to which they are situated according to the proposal of the schedule of implementation of Transport Strategies in its updated proposal.

In the schedule of implementation of railway infrastructure there are also included projects with which there cannot be excluded reassessment of the extent of the whole project with regard to their efficiency as the basic condition of funding from the EU funds and state budget.

Especially, the following constructions are concerned:

- Modernization of line Nemanice I – Ševětín, new line
- Ústí nad Orlicí – Choceň, new line
- Railway junction Brno
- Modernization of line Prague - Kladno with connection to Václav Havel Airport Prague

These constructions are respected in the proposed schedule of implementation according to supporting documents of the investor valid at the time of processing Book 6. Expected costs of these four constructions are - according to supporting documents of the investor - approximately 75 billion CZK. However, it concerns sections which must be dealt with in terms of investment and priority due to functionality of clusters of which these projects are part, or to which these projects directly relate. In case of reduction of investment demandingness of implementation of the given projects, there may be released financial resources for the implementation of other measures. For that reason, it is necessary to decide as soon as possible on the basis of detailed assessment of these protects within the framework of feasibility studies on such cases and to take into account results of such verification in the schedule of implementation of Transport Strategies in further update, for supplementation of information about the pursued variant will have a significant influence on the schedule of preparation and implementation of a number of other projects.

There cannot be entirely excluded a situation when project and proprietary preparation is not timely completed, or rather related investment activities crowned by issuance of a building permission enabling implementation of an economically effective solution to these fundamental investment projects (or possibly others) are not finished. In case that such unwanted situation occurred, it will be necessary to secure functionality of the given sections of railway network in a different manner - e.g. by economically justifiable restoring investment to the extent of the current territorial enclosures.

With some road projects/suggestions, assessed within the scope of Transport Strategies, the results of MMA do not provide a relevant picture of the state which must be respected within the framework of drawing up a schedule of implementation, and/or to evaluate separately.

- Brno – south-west and south tangent line – to assess whether not sufficient a six-lane section of D1 Kývalka - Holubice,
- Přerov – to check whether upon completion of D1, it will be necessary to implement in full extent projects with respect to through roads via the town.
- Náchod – to prepare a study which will recommend solution of a critical situation on I/33 - i.e. whether it is more appropriate to complete first the bypass of Náchod and then R11 road, or on the contrary, to make use - for calming down on I/33 - of expressway R11 which as part of the TEN-T core network must be implemented by the year 2030 at the latest. At the same time, it is necessary to deal with "confluence" of two bypasses on roads I/14 and I/33, which together with a nearby expressway does not show to be fully effective solution.
- Section R 43 Svitávka - R35 – transport-engineering assessment of an economically more effective solution, i.e. increase in capacity, and part relocations on the existing road and building a relocation near Svitavy as a temporary solution until possible completion of R43 in the long-term horizon, for this section R43 shows bad results of economic evaluation in zCBA (and other MMA pillars).
- In the section of road I/35 Úlibice - Ohrazenice - to propose an optimal solution for class I road with such a number of traffic lanes and with minimum influences on the environment which will be maximally transport-functional with regard to expected intensity, for a four-lane communication shows to be in the long-term horizon as unsubstantiated in terms of capacity.
- Road I/56 between Ostrava and Opavou was not on the basis of the carried out capacity analysis recommended for rebuilding to an expressway, for there is already implemented gradual modernization and increase in capacity of parallelly running road I/11. Study should show solutions at the place of connection of I/56 on D1 and also to deal with cooperation of both roads which economic efficiency is considerably influenced by the confluence.
- The town of Bílina is a principal point defect in otherwise complete four-lane running of road I/13 in the section of Chomutov – Most – Teplice –

Ústí nad Labem. For the time being, there is no technically appropriate and economically efficient solution, necessary to further check possibilities of a solution.

- Within Book 7, there were adopted in relation to road projects - investment-demanding and in terms of capacity not entirely corresponding with a demand of users (negative results of evaluation of MMA and a potential of bad results of economic efficiency) - a series of recommendations for further procedure in preparation of these projects. Individual recommendations, however, must be elaborated outside of the project of Transport Strategies. Individual approach to individual parts of the superior road transport infrastructure is described in the next chapters.
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61 Partial transport strategies for the periods

Transport Strategies (proposal of implementation) has a different distinguishing level for direffent time horizons, given especially by diffrent accuracy of prognoses and available technical documentation for individual proposed measures:

- for the period of 2014 to 2020 at the level of individual measures (projects),
- for the period of 2020 to 2035 at the level of compact packages of measures (clusters of projects and suggestions),
- for the period of 2035 to 2050 at the level of financial resource in total.

61.1 Transport strategy 2014 – 2020

F**inancial framework** of resources was defined in chapter 4.3 within the scope of drawing up the Proposal variant of funding. For determination of the schedule of implementation of projects in this period, there is an expectation of relatively stable financial framework.

Strategy for this period is focused on concrete measures, needs of maintenance and development of the transport network. Implementation of measures is determined according to output of Book 7, on the basis of results of their evaluation according to Book 8, according to principles of construction of strategy described in chapter 6 of Book 10 with the matching (=pairing) to financial sources of the Proposal variant of funding (chapter 4.3 of Book 10).

EU funds are recalculated with a relatively strong rate of CZK/EUR according to long-term prediction of MF, see chapter 4.6. In case that the exchange rate CZK/EUR does not develop according to long-term prediction of MoF - it would not strengthen - it would be theoretically possible to implement slightly more projects with the use of EU sources than mentioned by this concrete schedule of implementation of Transport Strategies.

Due to a possibility of use of rule n+3 which will enable to draw resources from the program period of 2014 - 2020 up to the end of the year 2023, individual measures of projects are worked with in this horizon until the end of the year 2023.

Strategic objectives of the proposal horizon:

- *Earmarking of necessary resources for maintenance, repairs, and reconstructions which will lead to improvement or at least non-worsening of the current state*
- *Completion of unfinished constructions, particularly from the program OPD for the period of 2007 – 2013, and maximization of using up allocation of this program*
- *Assessment of prepared constructions with concluded contracts*
- *Preference of constructions appropriate for co-funding from EU sources within the scope of new OPD for the period of 2014-2020, especially TEN-T*
- *To improve accessibility of regions and to remove bottleneck*
- *To systematically increase efficiency of use of the existing infrastructure and to reduce external costs caused by transport*
- *Preparation and implementation of PPP pilot project, or in combination with EU funds*
- *Selection of other development projects on the basis of evaluation of Book 8, including "reserve" projects, in division according to packages and modes*
- *Carrying out of institutional modifications according to chapter 6*
- *Setting the schedule of preparation of projects for the following period, including the plan of transfer of suggestions to projects - determination of further procedure in the matter of FC/HST*

These objectives is a guideline for the setting of concrete measures in defining needs and allocation of financial sources for transport infrastructure.

On the basis of evaluation of clusters, there is stipulated an order in the detail of individual projects with consideration of the order of clusters according to preparedness. Principle of preparedness is used with constructions commenced before the year 2018. **The principle being that preparation of constructions is to be governed for the following period by outputs from Transport Strategies, not vice versa.** Thereby there is determined an expected possible start of building, end of building proceeds from time limits for the funding of projects from European funds, using a principle n+3 at the latest by 31/ 12/ 2023/ Commencement of operation will always be directed - with the whole cluster - to the same time, there will be preferentially built compact routes, separate projects may be included only in the form of substitute projects in case of insufficient preparedness of projects in compact clusters.

Financial allocation of **national sources** which is not necessary for coverage of packages of group B, C, D and for the co-funding of EU sources is used in the rate of 60 : 35 : 5 (road, railway, water). Thereby, there is partially balanced predominance of sources from the EU for railways in a situation when there is clearly a higher need and preparedness of road projects.

In case of evaluation of the cluster in the 2nd pillar by marks D or E, very careful preparation of measures with respect to compensation of influences is necessary and it is necessary to discuss the project with bodies of protection of the environment and involved citizens' associations. Construction with low marking in all pillars will not be probably carried out. In case of conflict between needs and risks of non-discussibility, only fundamental modification of the project being a solution in some cases while keeping its basic transport functions.

Railway junctions and intersections on D+R enter into the schedule of implementation from separate lists, for they are not always objectively evaluable according to MMA. Junctions are added according to affiliation with completed or carried out routes (primarily corridors). Intersections on D+R will be capable of being implemented according to importance of infrastructure which they complement, and the area which they attend to. Not insignificant factor in both cases being also preparedness.

In the separate list there are also measures on class I roads, for class I roads are mutually evaluable with difficulty on the basis of outputs of a transport model and MMA. Limited financial resources according to the Proposal variant of funding do not enable - within a period of 2014 – 2020 - to implement all necessary bypasses and relocations of class I roads. Therefore, there must be selected those measures in the schedule of implementation which are in a very good stage of investment preparation and at the same time they deal with an important function on backbone national routes (according to results of the transport model), or they constitute bypasses of towns affected most by transit transport**. In case that there are increased in the period of 2014 – 2020 available funds of the** Ministry of T**ransport beyond the scope of the Proposal variant of funding, it is just the measures on class I roads that should be implemented with priority, for the EU sources can be utilized for these events only in a very limited extent. This also applies to necessary measures on expressways R4 and R7 which are not part of the TEN-T.** Another suitable measure in the case of allocation of an increased degree of national resources is to use the sources for pre-financing projects eligible for funding from the EU where invested resources can be refunded subsequently if needed. For example, the financing of modernization of D1 Mirošovice – Kývalka from national sources could lead to providing sources from the Cohesion Fund for other priority development measures.

A higher extent of construction of bypasses cannot be taken into consideration until obligations arising from the TEN-T regulation have been fulfilled at least in the extent of the TEN-T core network (need of completion by the year 2030). Results of assessment of clusters of Transport Strategies clearly prefer construction of compact backbone routes within the TEN-T. In the period until

2020 there are earmarked for the implementation thereof the strictly necessary financial resources. Decision on implementation of a concrete event, however, must be always supported in practice by a positive result of evaluation of economic efficiency.

The most important projects on class I roads may be thus implemented already in the period until 2020, particularly, e.g. measures on road I/3 where it is not possible to objectively determine the date of completion of preparation of motorway D3, and the need of improvement of the given connection is very urgent (even though with the use of temporary - not entirely ideal in the long run - solution). For a similar reason, there is also considerably preferred expedited construction of the Slaný bypass on road I/16 which may temporarily serve for diverting transit transport in relation D8 - D1 outside of the built-up area of the capital city of Prague (with the use of R7 and the southern part of Pražský okruh "Prague ring road"). Within 2014 - 2020, it is necessary to further concentrate especially on completion of those clusters which are part of routes built only partially and which completion has a significant influence on benefits (efficiency) of already finished constructions.

Implementation of projects of railway infrastructure in the period of 2014 - 2020 proceeds from a justified need (Book 8) and most financial resources is directed at the completion of transit railway corridors including railway junctions so that the railway corridors are compactly functional by the year 2020. Another key task in this period being completion of project preparation and commencement of implementation of priority projects of railway infrastructure on the TEN-T network, which are Upgrade of the line Brno - Přerov, Upgrade of the railway junction Brno and Upgrade of the line Praha - Kladno with connection to Václav Havel Airport Prague. It concerns projects demanding in terms of finance and time, which completion and putting into operation is expected in 2020 – 2025. The issue of further direction in the matter of high-speed lines/fast connections is devoted to in chapter 7.1.5.

In the area of operation of railway vehicles, it will be necessary to evaluate advantages, disadvantages and financial demands of possible unification of the railway electrification system on the whole territory of the Czech Republic, taking into account electrification systems in the neighbouring countries.

Constructions are put into the period of implementation. In case of their co-funding from the EU funds, there is stipulated an expected amount of their cofinancing in the simulator of construction of projects, and total expected costs according to supporting documents of investment organizations are mentioned.

It is possible to make use of mutual interchangeability of individual financial sources during the concerned period if rules governing their utilization enable so. Thus, it is admissible to implement some events proposed to be financed from national sources as EU events and the other way round in case sources are allocated above the limit of the Proposal variant of financing.

Transport mode	Total [billion CZK]	OPD I (EU share)	CEF cohesion (EU share)	OPD II-FS (EU share)	OPD II-ERDF (EU share)	National co-funding	Solely national financing
Roads and motorways	**157.8**	11.0	6.5	27.2	8.0	31.6	73.5
Railway	**127.1**	19.3	16.2	22.8	-	28.3	40.5
Waterways	**10.3**	0.2	2.6[25]	0.9	3.2	1.7	1.7

It does not concern the total allocation of the EU sources from the program period of 2014 – 2020, for with regard to the possibility of use of resources from this period until the end of the year 2023, the part of the resources is also drawn at the beginning of the following period of 2021 – 2023.

Table 61.99 – Division of available sources into investments according to transport modes in the period of 2014 – 2020

For the period 2014-2020 the methodically selection of projects was done from such clusters that on the basis of evaluation of national demand through the traffic model seems to be a key one for the removal of bottlenecks within the network. Bottlenecks were evaluated from the capacity point of view as well as from the perspective of current impacts on the environment. For realization are therefore recommended in particularly projects adressing finalization of interconnections between all economic centres of national importance (regional cities and further significant urban and industrial agglomerations). The approach of the processor of this document as regards evaluation of demand was conceived with the respect to mutual demand of users between such centres. The evaluation of options meeting the demand was carry out on multimodal basis. Therefore projects for removal of bottlenecks are suggested both in case of road and rail transport. In localities with navigable rivers the potential of inland waterways was also evaluated In order to improve overall modal split.

[25] The issue of use of CEF sources for hydraulic constructions is dealt with in detail in chapter 7.1.6, within the scope of hydraulic constructions there is expected a possibility of use of sources from the so called European part of CEF.

61.1.1 Road projects with the commencement of implementation by the year 2020 with financial coverage according to individual available financial resources in the Proposal variant of funding

Projects for TEN-T implemented within OPD I in the years 2014 – 2015 with possible division into phases (completion of the part phase of the project after 2015)				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
D1 Přerov - Lipník	3	7,300	2014 – 2017	The project is part of assessed cluster CS004P (Říkovice – Přerov). The Implementation start is conditioned upon the successful completion of contractor selection. The project will have to be divided into phases. In case phasing is not applied to this project, it will have to be executed completely using the FS resources in the following period. The project deals with the completion of the D1 motorway around the city of Přerov, where all the traffic today has to pass right through the city centre with all the adverse impacts on the environment and the public health. The capacity of the existing road is entirely used. LOS assumption after completion: C. After the completion of the D1, the area will offer a major potential for further economic development – urbanised development axis.
Modernization of D1 Mirošovice	-	3,000	2013 – 2015	Main motorway artery of the CR - part of the TEN-T core network. Considerable need to improve technical parameters of the obsolete

- Kývalka		(only the segments implemented under OPD I)	(only segments implemented under OPD I)	motorway. It was not evaluated in MCA - need is unquestionable. There are stated only costs of sections the implementation of which is allowed for within OPD I. Within the framework of OPD I it concerns sections 4,7,12,21 (contractor already selected) and in 2014-2015 implementation of sections 3 and 18 is expected. Other sections with the use of the Cohesion Fund or with the use of national resources-principle of mutual interchangeability of sources with priority projects.
D3 Veselí nad Lužnicí - Bošilec	9	1,534	2013 – 2015	Part of the important cluster CS006P (Veselí nad Lužnicí – Třebonín). Deals with a capacity increase on the existing I/3 road and bringing the D3 motorway from the completed section closer to České Budějovice. Traffic safety and fluency will increase. LOS assumption after completion: B. Implementation of other parts of the cluster is expected with the use of FS resources in the following period.
D3 Borek - Úsilné	9	1,430	2013 - 2015	
D3 Bošilec - Ševětín	9	2 746	2013 - 2017	Part of the important cluster CS006P (Veselí nad Lužnicí – Třebonín), which will bring the D3 motorway to České Budějovice from the north and, together with the other sections executed with EU support, will contribute to the completion of an uninterrupted segment of the D3 in the South Bohemian Region. The projects deal with capacity increases on the existing I/3 road, traffic safety and fluency increases. LOS assumption after completion: B.
R6 Lubenec - Bošov	14	2000	2013-2015	A trunk road feasibility study for the entire missing portion of the R6 has been elaborated, including a proposal for the capacity optimisation of the design parameters of selected projects in the section Nové Strašecí – Karlovy Vary based on a recommendation of the Transport Sectoral Strategies. These design parameters will form a basis for further examination of the projects in terms of project design and ownership settlement preparation. The capacity optimisation of

				the component projects of the R6 brings them inside the assessment zone that justifies their execution, including the section Lubenec – Bošov. This specific section deals with a capacity increase on the existing I/6 in a steep climb behind Lubenec, where the possibility and access to the Karlovy Vary Region from Prague is worsened especially in winter. LOS assumption after completion: A.
R35 – MÚK Opatovice nad Labem - completion of the construction of an elevated motorway	4	1,560	2013 - 2015	The project is a condition for problem-free operation of the follow-up - very important - cluster CS023P (Opatovice nad Labem – Ostrov) and implementation of other parts of the cluster is expected with the use of FS resources in the following period. Deals with the necessary grade-separated crossing of the R35 with the I/37 connecting Hradec Králové and Pardubice.
I/11 Oldřichovice - Bystřice	8	3,354	2014 - 2016	The projects are part of important cluster CS046P (Třanovice – Bystřice) with a cross-border importance, which is part of the TEN-T according to the TEN-T regulatory draft. Contractor selection started in 2013. Project phasing is also expected. The current I/11 road runs through a heavily urbanised environment; its width parameters are totally unsatisfactory for the traffic that the road carries. High proportion of heavy freight traffic, negative impacts on population, frequent congestion, high accident rates. LOS assumption after completion: B.
I/11 Nebory - Oldřichovice	8	2,366	2014 - 2017	

Within the framework of need of using up maximum proportion of allocation of OPD I by the end of the year 2015, there is also continually evaluated the state of preparedness of other sections of the TEN-T network which could be appropriate for the using up of the allocation. Thus there is evaluated the state of possible commencement of projects which are well prepared for commencement, are of a priority character for the period of 2014 – 2020 according to results of Transport Sector Strategies, and at the same time they are provably economically efficient. There cannot be excluded a situation when other projects than mentioned above are started with the use of the OPD I funds. However, it will always concern implementation of a certain phase of the project which - in case it is not included within the framework of OPD I - would be implemented with the use of the Cohesion Fund in the following period.

Projects for TEN-T implemented in the years 2014 – 2015 with the coverage from national sources				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
D8 Bílinka - Řehlovice	-	4,300	2007 - 2015	Construction was not evaluated in the cluster. It concerns an unquestionable need of completion of a motorway which is part of the TEN-T core network. At the same time, it concerns the last missing part of the motorway connection of Praha – Drážďany. Implementation of the project being problematic over a long period from the viewpoint of disputes about legal validity of individual acts in investment preparation. Many building constructions in the whole section are, however, in an advanced phase of implementation (tunnel and bridge constructions). From the conceptual viewpoint and from the viewpoint of influences on the environment, and especially on public health, definitely the most appropriate variant being completion of the unfinished construction. By this approach, there will be transferred - within a short period - transit transport/traffic to parametrically corresponding communication by the implementation of which there are concurrently sufficiently protected individual components of the environment. Traffic from densely populated areas where today´s traffic goes through (class I road I/8, or I/30) will be

				transferred. Road I/8 and road I/30 go through the environmentally much more sensitive areas, and there is no protection of individual components of the environment or public health secured on them. Implementation of an entirely different technical solution to the transfer of traffic between two existing parts of motorway D8 would have considerably higher negative impacts than completion of motorway D8 in the unfinished section of Bílinka – Řehlovice would have. The remaining costs of completion excluding costs of landslide rehabilitation are quoted.
D11 Osičky – Hradec Králové	3	1,500	2013 - 2016	By implementation of this project there will be enabled connection of the operated part of motorway D11 from Prague with the cluster CS008P the implementation of which is expected with the use of CEF resources (cohesion part) from 2015. Due to evaluated risks, the construction is not expected to be included as the OPD I project. The project completion will enable heavy freight traffic along the entire section of the D11 between Prague and Hradec Králové, which is impossible at the moment due to the makeshift termination of the D11 at Praskačka. LOS assumption after completion: B.

Projects outside of TEN-T implemented within OPD I in the years 2014 – 2015

Project name	Band of evaluation of a cluster according to Book 8	Costs [mio CZK inclusive of VAT]	Implementation expected from - to	Note, importance of the project, risks
R4 Skalka – křižovatka II/118	-	900	2014 - 2015	Considerable point defect at the place of the current termination of expressway R4 (outside of TEN-T). Passage through Dubenec – formation of major congestion in peak times, negative impacts on population, impaired safety due to connection of adjacent plots to the thoroughfare. Long climb behind Dubenec towards II/118, difficult possibility in winter, common congestions on the climb. Project not evaluated in the cluster but following-up on cluster CS4015P which is recommended for capacity optimization (see further). The project deals with important quality improvement of possibility within the scope of this route and is within technical-economic acceptable parameters, thus recommended for implementation.
I/11 Mokré Lazce – border of districts Opava / Ostrava	-	4,346	2009 - 2015	The project was not evaluated within the cluster. Nevertheless, it concerns significant and necessary increase in capacity of connection between Opava and the regional capital Ostrava with direct connection to motorway D1 - TEN-T core network). The existing I/11 is totally unsatisfactory for the traffic volume it carries. Passage through many villages, long climbs on the existing road. What is more, the project completion will be a major relief not only for the I/11 but also the parallel I/56. LOS assumption after completion: B.
I/11 Prodloužená Rudná – border of districts Opava / Ostrava	-	2,998	2013 - 2015	
I/44 Vlachov - Rájec	-	1,018	2010 - 2015	The project was not evaluated within the cluster, nevertheless, it

				concerns a section constituting a significant part of connection to a remote area of districts Šumperk and Jeseník by which quality of connection of this region to the TEN-T network (expressway R 35) will be considerably increased. The current passage through the villages of Zvole and Vlachov will be eliminated at the same time; the current 1st class road parameters are totally unsatisfactory for the traffic volume it carries. LOS assumption after completion: A. The project is sized as part of the comprehensive future rerouting of I/44 with an assumption of greater traffic increase in the future.

Constructions on TEN-T of a border character proposed for implementation with the use of the CEF fund - cohesion part in the period of 2014 - 2020				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
D11 Hradec Králové- Smiřice	3	8,066	2015 - 2018	Projects of a border character (connection of CZ - PL) serving as a substitute of capacity-insufficient road I/33 which, moreover, goes through many communities where it considerably burdens the environment and public health. Congestions are frequent and the safety level is low. The capacity of the existing I/33 road is used fully. Part of the TEN-T core network with a very good band of evaluation. These two projects are part of a definitive solution of connection with Poland in the border point Královec - Lubawka which implementation is expected in the first half of 2020 – 2035. Already these parts of the project, however, increase very substantially the quality of transport in the border section, for they secure connection to the current border crossing in Náchod which will be used until the definitive route to the new border point Královec - Lubawka has been completed. LOS assumption after completion: B. **State of preparation May 2013:** taking place - update of DSP, buyout of land lots and engineering activity for SP
D11 Smiřice - Jaroměř	3	4,026	2015 – 2018	

Constructions on TEN-T proposed for implementation within the scope of projects of the Cohesion Fund in the period of 2014 – 2020				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
Modernization of D1 Mirošovice - Kývalka	-	11,000	2016 - 2022	Main motorway artery of the CR - part of the TEN-T core network. Considerable need to improve technical parameters of the obsolete motorway. It was not evaluated in MMA - need is unquestionable. Continuation in modernization of other sections which will not be implemented within OPD I. Use of resources of the Cohesion Fund in case that there is not preferred use of national sources according to a possibility of implementation of events to which such resources are - for the time being - preliminarily allocated (see further).
D1 Říkovice - Přerov	3	7,576	2015 - 2018	The Project is part of the evaluated cluster CS004P (Říkovice – Přerov). It concerns - together with section Přerov - Lipník nad Bečvou - the last section of motorway D1 by which there will be completed a significant part of the TEN-T core network in the axis Vídeň – Katowice. The project deals with the completion of the D1 motorway around the city of Přerov, where all the traffic today has to pass right through the city centre with all the adverse impacts on the environment and the public health. The capacity of the existing road is entirely used. LOS assumption after completion: C. After the completion of the D1, the area will offer a major potential for further economic development – urbanised development axis. **State of preparation May 2013:** taking place - update of DSP, buyout of land lots and engineering activity for SP

D3 Ševětín - Borek	9	2,615	2015 – 2017	Part of the important cluster CS006P (Veselí nad Lužnicí – Třebonín). Deals with a capacity increase on the existing I/3 road and bringing the D3 motorway from the completed section closer to České Budějovice. The projects deal with capacity increases on the existing I/3 road, traffic safety and fluency increases Traffic safety and fluency will increase. LOS assumption after completion: B. **Planning status as of May 2013:** A tender for the elaboration of tendering documentation for the project contractor selection is being prepared. Land purchases and building permit negotiations are underway.
D3 Úsilné – Hodějovice	9	6,586	2016 – 2021	Part of the important cluster CS006P (Veselí nad Lužnicí – Třebonín) which within the scope of motorway D3 creates a bypass of the regional town of České Budějovice - which is a significant defect point on the route Praha - Linz and where transit transport currently running via the town considerably burdens the environment and negatively influences public health. Within the framework of a designing solution of this section, there were adopted many compensation measures which minimize negative influences of newly built communication on inhabitants. The travel times along the north-south axis will be reduced substantially and all the environmental parameters in question will improve. LOS assumption after completion: B. The bypass will also be used for suburban transport. **State of preparation May 2013:** DSP being prepared, to be followed by buyouts of land lots and engineering activity for obtainment of SP. Preparation of tender documentation for selection of a contractor of construction - the carrying out of which will take place after issuance of SP /building permit/.
D3 Hodějovice - Třebonín	9	7,422	2016 – 2021	
R3 Nažidla – state border CZ/AUS	38	1,140	2018 - 2020	The results of the assessment of the cluster Třebonín – national border do not permit priority implementation of the entire section with the technical design proposed so far. Nevertheless, it is necessary to secure functional cross-border connection to the Austrian superior road network (S10) and to coordinate construction of these sections

				in terms of time. Therefore, cross-border section 0312/II was proposed into the schedule of implementation. Technical solution of section 0312/II will adapt to a mutual international treaty with Austria and to the technical solution of sections 0312/I and 0311 which must be prepared and subsequently implemented within technical-economic adequate parameters (KON) upon repeated evaluation within the scope of update of Transport Sector Strategies.
R35 Opatovice – Časy	4	6,123	2015 – 2018	Projects are part of the important cluster CS023P (Opatovice nad Labem – Ostrov). It concerns one of the clusters with the highest priority, with one of the best results within the scope of evaluation of needs. It concerns continuation of construction of the second capacity-parallel connection between Bohemia and Moravia when previous subparts of R35 (in the direction of connection to D11 to Prague) were built up with the EU support in the last period, or their implementation is still expected to be within the scope of OPD I (R35 – MÚK Opatovice nad Labem, completion of the construction of an elevated motorway). The cluster implementation will relieve the cities of Hradec Králové and Pardubice from through traffic. Major user time savings, major environmental and health improvement in both the cities, as well as villages along the current I/35, the capacity of which is used fully. Congestions are frequent. High share of through freight traffic. LOS assumption after completion: B. **State of preparation May 2013:** DSP being prepared, to be followed by buyouts of land lots and engineering activity for obtainment of SP. Preparation of tender documentation for selection of a contractor of construction - the carrying out of which will take place after issuance of SP /building permit/.
R35 Časy - Ostrov	4	5,014	2015 – 2018	

R48 Frýdek Místek, bypass incl. connection to R56	9	6,133	2015 – 2018	This project is the most significant missing section of expressway R48 in the Moravian-Silesian Region - part of the TEN-T comprehensive. By implementation of the project there will be completed the second capacity connection of the CR and Poland. By implementation of the project, the route which predominant part before the town and behind the town was built in the past period with the use of the EU funds will become consolidated. The project creates a bypass of the town of Frýdek Místek (approx. 60,000.00 inhabitants) and also connects a significant capacity communication R56 between Frýdek-Místek and the regional town of Ostrava. Transit transport currently runs through the centre of the town and considerably burdens the environment and negatively influences public health, by implementation of the project such considerable negative influences will be eliminated. Within the framework of project preparation there were adopted many measures for reduction of impacts of implementation of this construction on the environment. LOS assumption after completion: B. **State of preparation May 2013:** There are being completed buyouts of land lots, there is being prepared tender procedure for the preparation of tender documentation for the selection of a contractor of construction, there are being finished engineering activities for obtainment of a building permit. The Ministry of Finance promised to announce in 2013 a tender procedure for removal of a dump site of dangerous waste (the so called "Skatulův aluminium"). Before removal of this dump site, there cannot take place any construction in the part of the structure, nevertheless, it concerns just a very small section which is settled and adjusted in terms of property and it does not have to block commencement of construction in next parts.
R49 Hulín - Fryšták	13	7,211	2014 – 2018	The first part of the cluster CS029P. It concerns an important part of the TEN-T core network in the axis West (CZ) – East (SK). The implementation of the first part of the cluster alone will contribute to an improvement of the transport services for the regional capital Zlín and,

				together with the adjacent section planned for completion after 2020, it will completely take through traffic away from the present-day city centre thoroughfare, which is burdening the environment and public health considerably. LOS assumption after completion: B. **State of preparation May 2013:** There is being finished engineering activity with respect to the possibility of filing an application for a building permit. Update of formerly issued opinions of the bodies involved and obtainment of missing documents. There has already been selected a contractor for the construction. Within the framework of conclusion of an amendment to the contract which will enable to start implementation of the construction, it is necessary to minimize possibilities of occurrence of non-allowable costs.
R55 Otrokovice, bypass JV	13	1,077	2016 – 2019	Continuation of implementation of gradual construction of R55. By constructing this section, there will be made short extension of the expressway behind the town of Otrokovice when today´s provisional termination implemented with the EU support in the past period is entirely insufficient in terms of capacity and transport going further in the southern direction along I/55 must still go through the town of Otrokovice where it very negatively influences the public health of inhabitants. By implementation of this section there will not be forecast any further running of the route R55 via Bzenecká Doubrava. It will still be possible to make a link to this construction by a different alternative routing of R55 in case that a change of such routing is unavoidable. LOS assumption after completion: B. **State of preparation May 2013:** There are being finished buyouts and carried out engineering activity leading to the possibility of issuance of a building permission.
I/68 Třanovice - Nebory	8	2,693	2016 - 2018	The project is part of the important cluster CS046P (Třanovice – Bystřice) with the border importance which is - according to the TEN-T Regulation - already part of this network. Previous two projects of this cluster will be commenced within OPD I and their further phase will be finished with the use of OPD II funds. Thus, it concerns a project by

				which there will be finished implementation of the compact cluster. The existing I/68 road runs through a heavily urbanised environment and its width parameters are totally unsatisfactory for the amount of traffic it carries. High share of heavy freight traffic, negative impacts on population, frequent congestion, high accident rates. LOS assumption after completion: B.

Constructions on TEN-T being prepared for implementation as part of the Cohesion Fund projects in the period of 2014 – 2020 as projects to increase the absorption capacity in case of a) decreases of tender prices for projects with higher priority b) delays in preparation of projects with higher priority c) weakening of CZK – development of the CZK/EU exchange rate different from what was expected				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
R3 Třebonín – Kaplice, railway station (KON)	-	-	2017 - 2020	After the capacity has been optimized in accordance with recommendations of Transport Strategies, the costs of this technical solution will be determined and the band of evaluation of the whole R3 will be recalculated. The need for implementation of this cluster is justified by very poor parameters of the current situation of the existing class I road and follow-up to the previous clusters (D3) with high priority. Completion of interconnection with the motorway network of Austria is also of a key importance for the CR. In order to increase the absorption capacity of the projects eligible for FS under OPT II, the costs of the optimised design are estimated at CZK 6.25 billion (version KON R3 as per Book 7). This amount will be refined under the detailed capacity optimisation proposal, including a conversion for the attainable assessment zone.
R3 Kaplice, railway station – Nažidla (KON)	-	-	2017 - 2020	
R6 Nové Strašecí - Řevničov	14	1,420	2016 - 2019	A trunk road feasibility study for the entire missing portion of the R6

R6 Řevničov, bypass	14	1,850	2016 - 2019	has been elaborated, including a proposal for the capacity optimisation of the design parameters of selected projects in the section Nové Strašecí – Karlovy Vary based on a recommendation of the Transport Sectoral Strategies. These design parameters will form a basis for further examination of the projects in terms of project design and ownership settlement preparation. The capacity optimisation of the component projects of the R6 brings them inside the assessment zone that justifies their execution. The capacity optimisation will be studied especially in the less busy sections of the entire R6 trunk road. The projects listed here have been recommended as part of the recommended alternative of the feasibility study for examination in the four-lane arrangement (R25.5/100 or R25.5/120). LOS assumption after completion in the capacity-optimised sections: C; in the four-lane sections: B, locally even A.
R6 Lubenec, bypass – Phase I	14	1,620	2017 - 2019	

Constructions on TEN-T with expected financing from national sources in the period of 2014 – 2020, with available allocation possibly included for the funding from OPD II				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
R1 511 Běchovice – D1 incl. increase in capacity of R1 510 Běchovice - Satalice	3	11,500	2018 - 2021	It is absolutely essential to primarily solve the interconnection of individual motorways in the south-east segment of Prague (D1 – D11). Project R1 511 has been evaluated as the most important road project in terms of the needs assessment – need to take traffic away from parts of Prague that suffer serious adverse impacts of traffic, where the traffic is carried by roads not sized for its amount. Possibility of commencement of its implementation is, however, conditioned by many administrative steps which time demandingness is considerable. Therefore, there cannot be anticipated earlier commencement of its implementation (year 2017 being an optimistic date). **For the implementation of the contruction, there are not - within the scope of matching (=pairing) of sources to projects - earmarked resources of the Cohesion Fund, but resources from the available framework of national sources.** In case development of implementation of projects within the Cohesion Fund (priority projects of the Cohesion Fund) proceeded in the way that absorption capacity of the Cohesion Fund enables to include and implement this project with the use of such sources, then it is a possibility which should be made use of and taken into consideration in further updates of the schedule of implementation of the Transport Strategies. The possibility to implement the construction in this form is subject to the condition of stabilization in the Principles of Territorial Development of the Capital

				City of Prague.
R35 Ostrov – Vysoké Mýto	3	4,100	2017 – 2020	From the viewpoint of evaluation, it concerns the **most needed sections within the framework of the TEN-T comprehensive network**. Traffic will be diverted from the existing I/35 along with part of the current volume of the D1 – a parallel connection between Bohemia and Moravia will be made. This will result in major time saving and environmental and public health improvement along the existing route, which passes through many villages and major towns of Vysoké Mýto and Litomyšl. The capacity of the existing I/35 is now totally used up, and substantial congestion is frequent. The current state of preparation does not enable, unfortunately, to expect an earlier term of commencement of implementation than the year 2017. Date of commencement in 2017 is optimistic, from the side of the investor and state administration bodies involved it is necessary to do the maximum for speed-up of preparatory works at this date. Within the framework of matching (=pairing) of sources there is expected financial coverage from national sources with the financing of the rest in 2021 after the expected earliest possible putting into operation in the year 2020. However, the projects will be prepared in the way that they could be possible included in OPD II and EU sources could be used for them in case that on the date of implementation there is - within OPD II - available allocation.
R35 Vysoké Mýto – Džbánov	3	2,340	2017 – 2020	
R35 Džbánov – Litomyšl	3	1,300	2017 – 2020	
R35 Litomyšl - Janov	3	7,300	2017 – 2020	
R35 Janov - Opatovec	3	5,000	2017 – 2020	

Constructions outside of TEN-T proposed for implementation within the scope of projects co-funded from ERDF in the period of 2014 – 2020				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
I/3 Mirošovice - Benešov	-	551	2015 - 2016	It concerns upgrading of the most utilized part of the existing road I/3 which - until construction of the Central Bohemian part of motorway D3 - will serve as a transit artery to the area of the South Bohemian Region. At the same time, it concerns a very significant feeder road from Benešov to Prague. Current safety parameters and capacity of the communication do not comply with the current transport flows at all. For this reason, it is necessary to approach solution to this situation in the short-term horizon and to improve the safety and level of quality of transport on this communication until construction of the Central Bohemian part of motorway D3. It concerns partial reconstruction which will enable to mark on the road - by turns - 2+1 lane in each direction. However, even upon completion of the construction of the Central Bohemian part of motorway D3, road I/3 will remain in this section to be a very significant road with high transport intensities.
I/11 Opava, northern bypass, eastern part	21	1,135	2016 - 2018	Significant part of the bypass of the important big town in the Moravian-Silesian Region which indirectly follows up to implemented parts of I/11 constructions between Opava and Ostrava. By implementation of the construction, it will be enabled to divert transit transport outside of densely built-up areas of the town of Opava.
I/14 Kunratice – Jablonec n. Nisou	31	556	2014 - 2016	The contruction deals with relocation of road I/14 between towns of Liberec and Jablonec. It concerns the last section of the set of relocations of which the predominant part was already implemented

				in the past. By completion of the construction of this section there will occur a possibility to transfer transport from the current unsatisfactory communication run through the built-up valley with a number of negative influences on the environment and public health.
I/16 Slaný - Velvary	92	2,017	2016 - 2019	Construction constitutes an important bypass of the town of Slaný in the Central Bohemian Region. Within the framework of evaluation, however, the project does not show - in coexistence with constructions of the north-west segment of the Prague ring road - a good band of evaluation. Nevertheless, it is necessary to perceive the fact that there are very high risks of approval processes with such entirely fundamental constructions of the Prague Ring Road (R1). Not good transport situation in the capital city of Prague thus leads to the need of implementation of a solution which will enable to divert transit transport in relation of D8 - D1 outside of the built up area of the capital city of Prague (with the use of R7 and the southern part of the Prague ring road) already in the medium-term horizon. With the long-term absence of constructions of the north-west segment of the Prague ring road - which implementation will not most probably be commenced before the year 2020 (regardless of availability of sources), the implementation of this section shows a considerable added value for the functioning of a transport system in the neighbourhood of the capital city of Prague. At the same time, upon completion of the construction of the given segments of the Prague ring road, the implementation of this project will have its substantiation. In connection with the implementation of this measure, it will be necessary to carry out adaptations to expressway R7, or road I/7 between Prague and Slaný so that there is secured safety due to the expected increase of traffic (especially, adaptations - MÚK, removal of the level crossing, etc.)
I/26 Staňkov, relocation	61	472	2014 - 2016	Defect point on considerably utilized road I/26 connecting the Plzeň region with Germany. By implementation of this bypass there will be significantly improved transport accessibility of the Domažlice region

				towards Plzeň and accessibility from Plzeň to border areas of Germany (Cham). Strategic transport model did not evaluate - with regard to the extent of its detail - this point defect as significant. In spite of this fact, this project - which autonomously shows good results of economic evaluation - is recommended for implementation.
I/27 Přeštice, bypass	11	728	2017 - 2019	Part of a very well evaluated cluster near the regional town of Plzeň. By implementation of this project which represents the most important part of this cluster outside the territory of the town of Plzeň there will be removed a fundamental defect point on the route between Plzeň and Klatovy and considerably there will be improved accessibility of the Klatovy region to the TEN-T network.
I/33 Jaroměř, bypass	11	928	2016 - 2017	Bypass of the town of Jaroměř directly follows up to motorway D11 which implementation is expected with the use of resources of the CEF fund (cohesion part). Construction of this bypass is a condition for the launching of traffic on motorway D11, for until the completion of the construction of the follow-up parts of the border section R11 to the border on Poland it will enable to divert traffic from the newly completed D11 to the current class I road towards Náchod. Upon completion of the construction of R11, this communication will continue to have its importance for transport services of the Náchod region and passenger traffic to border areas of Poland (Klodzko).
I/34 Božejov – Ondřejov - Pelhřimov	-	750	2014 - 2016	By implementation of this measure, there will be removed a fundamental defect point (2 communities with inappropriate directional and width alignment with respect to the current class I road) on the important route between regional towns of Jihlava and České Budějovice. However, the strategic transport model did not evaluate - with regard to the extent of its detail - this fundamental point defect as significant (therefore there is no band of evaluation). In spite of this fact, this project - which autonomously shows very good results of economic evaluation - is recommended for priority implementation.

I/35 Lešná - Palačov	14	2,340	2017 - 2020	Construction obtained the given band of evaluation in a reduced form against the long-term observed solution (carrying out of capacity reduction at the place of crossing with expressway R48). By implementation of this relocation of road I/35 there will be significantly improved transport accessibility of the whole Walachian region, for by the implementation thereof it will assume transport load from two current class I roads (I/35 Hranice – Valašské Meziříčí and I/57 Nový Jičín – Valašské Meziříčí. At the same time, the project directly follows up to two constructions implemented within OPD I and thus it secures their full utilization. By implementation of the project, there is concurrently improved transport accessibility of the important town of Vsetín to the TEN-T network.
I/36 Časy - Holice	12	237	2017 – 2018	By implementation of this project there will occur capacity-connection of expressway R35 (implementation from resources of the Cohesion Fund) to the south-eastern part of the Hradec Králové region.
I/36 Sezemice, bypass	12	680	2017 - 2018	By implementation of this project there will occur capacity connection of the regional town of Pardubice to the eastern part of R35 towards Moravia (implementation from the resources of the Cohesion Fund).
I/37 Pardubice - Trojice	-	756	2014 - 2016	It concerns a very significantly utilized - in terms of transport - part of the through road of I/37 via the peripheral part of the town of Pardubice when it is necessary to urgently deal with capacity problems arising there daily. By implementation of the project the quality of transport in the north-southern direction between the Pardubice and Hradec Králové Regions will be significantly improved. The project follows up to sections I/37 implemented within OPD I.
I/42 Brno VMO Žabovřeská I.	-	2,385	2015 - 2018	The project is part of the Big municipal ring road in Brno and is the last missing part in its western segment. By implementation of this project, there occurs considerable improvement in the whole town of Brno. Traffic from densely populated parts of the town will be transferred to capacity communication respecting in the maximum possible extent protection of the environment at the place of its running. Until the construction of R43 between D1 and Kuřim, it will

				also serve for transit transport in the direction to north on road I/43 with the use of other already existing parts of the infrastructure. The project does not have a band of evaluation, as the strategical transport model does not provide - in the municipal environment - sufficiently relevant results for determination thereof.
I/43 Hradec nad Svitavou - Lačnov	31	788	2017 - 2020	With regard to prioritization of measures, results of economic evaluation, available financial sources and complexity of approval processes, it will not be probably possible - within a period by 2030 - to finish construction of expressway R43 in the section of Svitávka - Staré Město. Traffic situation on the current I/43, however, is not satisfactory already at present. A critical point being especially the running of traffic via the centre of the town of Svitavy. Therefore, it is appropriate - already in the short-term horizon - to implement this project and improve the given situation. At the same time, it is desirable to also prepare and implement individual sub-measures for improvement of safety of traffic on the remaining parts of road I/43 from the relevant packages intended for this type of measures.

Constructions outside of TEN-T proposed for implementation from available national resources in the period of 2014 – 2020				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**Implementation expected from - to**	**Note, importance of the project, risks**
I/9 Dubice – Dolní Libchava	22	1,196	2016 - 2018	Follow-up to I/9 MÚK Sosnová, implemented within OPD. Diversion of a significant part of traffic from the town of Česká Lípa.
I/9 Dolní Libchava – Nový	22	1,969	2019 - 2023	Follow-up to the previous section. By implementation there would be completed a compact - well evaluated - cluster creating the bypass of

Bor				the town of Česká Lípa. However, a decision on the implementation will be possible after the more detailed verification of economic efficiency.
I/20 Píštín – České Vrbné	-	1,688	2018 - 2021	Preliminarily recommended for implementation after the carrying out of capacity optimization. Necessary detailed preparation of the evaluation of economic efficiency and optimization of a solution. Communication will secure important connection of the western part of the South Bohemian Region to motorway D3 (along with implementation of Severní spojka).
I/20 Severní spojka /northern connecting road/, České Budějovice	-	1,363	2019 – 2023	Important connection of motorway D3 to the western part of the South Bohemian region outside of densely built-up area of the town of České Budějovice through which the current road I/20 passes.
I/27 Šlovice - Přeštice	11	1,530	2016 - 2018	Part of a very well evaluated cluster near the regional town of Plzeň. By implementation of this project there will be completed the part of the cluster in question outside the territory of the town of Plzeň. Follow-up to the bypass of Přeštice recommended for implementation from ERDF. Improvement of accessibility between Plzeň and Klatovy - improvement of accessibility of the Klatovy region to the TEN-T network. In case of sufficient absorption capacity of ERDF, possible merging with the bypass of Přeštice project if possible to coordinate in terms of time.
I/38 Znojmo bypass I	54	355	2014 – 2016	Completion of long-term built (only) partially project of the bypass of Znojmo, at least in the extent of these constructions, shows as entirely necessary, for it concerns a fundamental defect point on road I/38 between Jihlava and state border with Austria. The structure has been complicated for a long period by administrative matters. Its factual importance is, however, entirely unquestionable after the carrying out of local assessment.
I/38 Znojmo bypass II	54	460	2014 - 2016	

I/38 Havlíčkův Brod, bypass JV	52	1,773	2017 - 2019	It concerns a fundamental defect point on backbone class I road. At the same time, the north-east part of the bypass had already been implemented in the past and its completion proves to be desirable within the scope of homogenization of route I/38. However, economic evaluation being very problematic with the structure. In case of positive results, recommended for implementation.
I/37 Chrudim bypass, section Medlešice - inters. I/17	-	1,515	2013 - 2016	It concerns removal of a serious point defect on backbone road I/37 in its most utilized part near the regional town of Pardubice - removal of the passage via the town of Chrudim. Implementation of the structure follows up to previous sections I/37 between Hradec Králové and Pardubice which were homogenized within OPD I, or directly follows up to section I/37 Pardubice - Trojice which is recommended for implementation from ERDF within OPD II. The construction has a selected contractor and its implementation was commenced in 2013 by construction of part building constructions.
I/37 Chrudim bypass, section inters. I/17 - Slatiňany	-	756	2016 - 2018	Completion of the bypass of Chrudim and removal of the passage via the community of Slatiňany. By completion of this section, the whole section I/37 from Hradec Králové behind Chrudim will be completely upgraded.
I/57 Semetín – Bystřička, 2nd construction	11	1,214	2018 - 2021	The contruction will significantly improve the quality of transport connection of the Walachian region (the Vsetín region) to the TEN-T network (with the use of Palačovská spojka recommended for implementation within ERDF). The structure is recommended for implementation after the carrying out of capacity reduction against the hitherto followed proposal. Necessary separate checking of economic efficiency and adjustments of a technical solution. Valašské Meziříčí - the bypass of which must be intensively prepared for implementation in the following period - will thus remain the last fundamental point defect in transport connection of the Walachian region (the Vsetín region).

Constructions of class I roads (incl. express) outside the TEN-T network, recommended to be implemented in case national resources are allocated beyond the scope of the Proposal variant of financing or in case of a higher degree of ERDF in OPD II than expected in the Proposal variant of financing				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**The aerliest possible year of commencement of implementation**	**Note, importance of the project, risks**
R4 II/118 - Mirotice	33	8,686	2015	The cluster is used for a major quality increase in the accessibility of the Strakonice district and the Šumava mountains from Prague. Until the completion of a comprehensive D3 in the Central Bohemian Region, this trunk route will also continue to carry a considerable portion of the traffic between Prague and České Budějovice. The trunk road needs to attain economically effective parameters, which is difficult when assessing the projects in the assumed extent and in the context of the assumed completion of the D3. From the point of view of network completeness and the required high-quality access to regions, however, the construction of a four-lane R4 is the only solution that makes sense. The cluster will have to look for a more economic four-lane arrangement than the one proposed so far.
R7 Slaný - Bítozeves	14	10,220	2015	The current I/7 road already mostly runs outside of villages and towns (the sole exception being the settlement of Lotouš-Písky in the Central Bohemian Region). However, the TSS2 results for the long term indicate the need to increase the road capacity to four lanes. It is therefore advisable to funnel any resources beyond the Proposed Funding Alternative into improvement of parameters of this trunk road subject to attainment of required affirmative results of the

				economic assessment.
I/9 and I/16 Mělník, 1st construction	31	244	2014	4th construction to be also supported in the preparatory phase.
I/9 Dubá, bypass	-	640	• 2014	An under-contract construction, was not a subject-matter of the evaluation; the biggest settlement on route I/9 between Mělník and I/38, that does not have any bypass. The transport model evaluated the potential of road I/9 in the concerned segment between road I/38 and Mělník as less perspective. However, negative externalities on the territory of the municipality will be eliminated by its implementation.
I/11 Doudleby nad Orlicí, bypass	-	231	2015	A black spot on the Hradec Králové – Rychnov nad Kněžnou route
I/11 Opava, bypass, western part	46	1,640	2020	Continuation of the eastern part of the bypass & follow-up in the direction towards Poland
I/11 Komárov, bypass	-	1,450	2020	An interconnection between Opava and the following relocations: I/11 Mokré Lazce – district border of Opava/Ostrava – Prodloužená Rudná implemented from OPD I. The last substantial transport fault on the Opava – Ostrava route. Preparation needs to be solved in a conceptual manner.
I/12 R1- Úvaly	21	6,230	2018	The follow-up part to the implemented constructions of the Prague ring road (necessary for all, incl. alternative, variants of SOKP)
I/13 Kladrubská connecting road	-	2,125	2016	An improved interconnection between two parts of road I/13 near

				Teplice.
I/13 Bílina - bypass	-	3,520	2020	It is still necessary to look for an economically efficient solution. The costs are related to the variant with EIA consent, which is however not economically efficient.
I/16 Nová Paka, bypass	51	2, 120	2016	A significant black spot on the connecting road between Prague and the recreational area of the Krkonoše Mountains.
I/19 Kámen bypass	-	454	2016	A black spot on the České Budějovice – Humpolec link with importance for traffic. Increased loading is expected after D3 has been put to operation in the Tábor – Veselí n. L segment.
I/19 Chýnov	-	673	2016	A black spot on the České Budějovice – Humpolec link with importance for traffic. Increased loading is expected after D3 has been put to operation in the Tábor – Veselí n. L segment.
I/20 Jasmínová - Plaská	-	535	2018	Cluster CS073P I/27 Plzeň – border of the Plzeň Region was assessed. It comprised project S159 “I/20 and II/231 Plzeň Plaská - Na Roudné – Chrástecká”. The project is part of one of the three important north-south links within the Plzeň urban transport system “I/20 section Jasmínová – Plaská”. In the adjacent section “Na Roudné – Rokycanská”, the project has to be coordinated with the railway construction project “Plzeň Junction, Stage 4”. Decision on another convenient phasing of the entire section of the I/20 in question cannot be ruled out. The costs are related to this project only, not the entire Jasmínová – Plaská section of the I/20.

I/21 Nová Hospoda – Kočov relocation, 2nd construction	91	390	2015	A missing part in the mostly homogenised route I/21 between D5 and Karlovy Vary, with its modernization funded from the resources of OPD I.
I/21 Trstěnice - Drmoul	91	852	2016	
I/21 Planá – Trstěnice relocation	91	1,288	2020	
I/27 Klatovy, relocation, 1st construction	-	2,277	2016	A significant spot where intracity and transit operations are combined on a through road running through the city centre.
I/37 Velemyšleves, bypass	-	825	2015	An under-contract construction, was not a separate subject-matter of the evaluation. The CS074P Žatec – Most cluster was also evaluated by of the weighted sum of point scores of 3.9. Making a part of the connections of the towns of Most and Žatec to the Triangle industrial zone near R7 or the Joseph industrial zone near Most respectively. The horizontal and vertical alignment parameters of the current road are very unsatisfactory.
I/27 Žiželice bypass and bridging	-	598	2016	It is a part of CS074P cluster, for description see I/27 Velemyšleves, bypass.
I/27 Třemošenský Rybník - Orlík	-	342	2016	Improvement of parameters of the feeder to the regional city of Plzeň. Follow-up to the Třemošná construction, a bypass implemented from OPD I.
I/34 Lišov - Vranín	77	1,358	2018	A significant black spot on the České Budějovice – Třeboň – Humpolec route. Very high intensities on the through road with respect to frequent commutation journeys to the regional city of České

				Budějovice.
I/38 Církvice bypass	-	826	2016	A part of road I/38 between D1 and D11, when a bigger part of this road, which is very important in terms of transport and has a very high share of transit traffic, was already homogenized in the past, partially also with utilization of resources from OPD I (a bypass of Kolín and Nymburk).
I/38 Luštěnice - Újezd	46	963	2016	
I/38 Malín – Kuchyňka, relocation	-	153	2015	
I/38 Želetava, bypass	-	1,420	2020	A part of road I/38 between D1 and Austria with importance for transport; the municipality of Želetava is a considerable black spot, while a significant part of I/38 in this segment was already homogenized in the past.
I/42 Tomkovo náměstí	-	1,320	2017	A significant part of the Outer City Ring Road Brno
I/44 Bludov - bypass	32	4,120	2018	A part of the feeder from Mohelnice up to Šumperk and to the remote area of the Jesenicko region. Follow-up to the Vlachov – Rájec construction implemented from OPD I.
I/44 Červenohorské sedlo, south	-	611	2014	Crossing of the mountain saddle between Šumperk and the remote area of the Jesenicko region. The threatening emergency conditions of the existing road is advisable to be solved not by repairs, but by this investment which will concurrently improve its parameters in the same manner as it was done on the north side of the saddle in the past.
I/46 Olomouc –the east	46	2,770	2019	Elimination of the passage of road I/46 through the regional city of

tangent line				Olomouc. It is necessary to review the proposed capacity arrangement.
I/46 Šternberk, bypass	46	1,069	2018	Routing through traffic away from the city.
I/49 Vizovice - Lhotsko	-	273	2014	A critical black spot on road I/49 that will also serve international transit traffic for a long time until the construction of R49 is completed. R49 in this segment cannot be expected to be completed before 2030.
I/50 Bučovice, relocation	-	1,138	2018	A critical black spot on the existing road used as a connection between the CR and Slovakia.
I/53 Lechovice, bypass	-	394	2015	An under-contract construction that was part of evaluation of the evaluation in cluster CS112P Znojmo – Pohořelice, without reaching the band of evaluation. It is a critical black spot on a loaded route.
I/55, MÚK (split level junction) with the Přerov – Předmostí railway	-	667	2015	Connection of the town of Přerov to D1.
I/57 Krnov, bypass, the north-east part	91	1,941	2014	A black spot on the Ostrava – Opava – Poland route. The construction also solves the flood defence system for the town.
I/57 Valašské Meziříčí - Jarcová	21	2,908	2019	A critical black spot on the connection of the Valašsko region (Vsetín) to the TEN-T network. A bypass of the town of Valašské Meziříčí, which is significantly loaded with through traffic. Needs to be intensively prepared for implementation. Follow-up to the constructions implemented under OPD I and proposed for

				implementation under OPD II.
I/61 Kladno, bypass, Phase I	91	1,216	2020	Portion constituting a feeder road from the R6, which will also be the bypass of Velké and Malé Přítočno.
I/62 Děčín - Vilsnice	52	534	2015	An under-contract construction; was not a separate subject-matter of the evaluation. I tis a part of the future feeder from the town of Děčín to motorway D8, which was evaluated as a part of the clusters (CS135N).
I/67 Karviná, bypass	31	536	2016	A bypass of the town critically burdened with emissions.

Projects included in Government Resolutions on support to industrial estate development (only shows projects not included in any of the above categories)				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK inclusive of VAT]**	**The aerliest possible year of commencement of implementation**	**Note, importance of the project, risks**
D1 připojení Brněnské průmyslové zóny (BPZ) Černovická terasa	37	1,342	2016	Project under preparation to improve connection of BPZ Černovická terasa to the D1. Very difficult cumulation of multiple connections over a short section of the D1: requires collector roads. The BPZ is relatively well connected via existing Exit 201 off the D1.

R48 Rybí – Rychaltice	38	4,354	2015	This is a reconstruction of the four-lane road I/48 without a median strip to one with a median strip. The project benefit will be in a considerable traffic safety increase. It is also true, however, that the capacity of the existing road is sufficient and that the traffic will decrease even further after the Polish A1 connecting to the D1 is fully opened for all traffic, including freight, and that traffic safety increase is possible using other methods than a complete reconstruction (physical separation of opposing traffic lanes).
I/58 Příbor - Skotnice	-	1,250	2016	The rerouting of the I/58 is an induced investment in the event of the construction of the section R48 Rybí – Rychaltice, because the design for the reconstruction of the existing I/48 includes omission of the Příbor Centrum interchange, which connects the existing I/58. The existing thoroughfare of the I/58 along the margin of Skotnice does not show any major transport defects – it is a historical rerouting of the previous through road.
I/58 Mošnov, obchvat	-	1,132	2016	The project in preparation connects to the previous rerouting I/58 Příbor – Skotnice and is intended as a new route for the I/58 outside of Mošnov-Malá Strana, through which the historic rerouting of the original road runs; it used to run right through the centre of Mošnov on the other bank of the Lubina. With respect to the D1 motorway built and the feeder road to it (rerouted II/464), however, the traffic routes in the area have changed, with the part towards the D1 being busier and the importance of the I/58 for traffic towards Ostrava diminishes. Therefore, the technical design for the Mošnov area can change at the point of termination of the project I/58 Příbor – Skotnice.
R48 Bělotín - Rybí	38	4,345	2017	This is a reconstruction of the four-lane road I/48 without a median strip to one with a median strip. The project benefit will be in a

				considerable traffic safety increase. It is also true, however, that the capacity of the existing road is sufficient and that the traffic will decrease even further after the Polish A1 connecting to the D1 is fully opened for all traffic, including freight, and that traffic safety increase is possible using other methods than a complete reconstruction (physical separation of opposing traffic lanes). The I/35 rerouting (so-called Palačov Link) will connect near Dub; its technical design will be modified, and the I/48 reconstruction project will have to adapt to that.

It is a fact that an **increase in the national-level resources by up to CZK 10 billion a year** **compared to the Proposed Funding Alternative would enable the Ministry of Transport to execute the construction projects at a pace that would match the society-wide expectations and needs to improve the parameters of new transport infrastructure and construction of new infrastructure.** In addition to the enumerated road construction projects, this framework would enable a **much larger extent of revitalisation and safety measures on the railway network** than those enabled by the Proposed Funding Alternative. These projects will be prepared regardless of the fact that their implementation is not covered sufficiently under the Proposed Funding Alternative.

However, it is **absolutely inevitable from the point of view of strategic sustainability that this increase be of a longer-term nature, because failing that** (only one-year increase without support to the outlook or successive budgetary cuts in the following years compared to the budgetary outlook assumptions), **the funding for starting construction projects – which are longer-term by nature – could not be ensured. In such a case, construction projects commenced would have to be mothballed, with all the resulting adverse consequences**, including those resulting from contracts for multiple-year project execution.

It is also true that in the event of allocation of funds beyond the Proposed Funding Alternative in 2015-2018, these increased resources cannot be used to execute the highest-priority measures, because their state of readiness will not enable the start of implementation by then.

In case the Government of the Czech Republic decides to increase and stabilise the long-term funding frameworks beyond the Proposed Funding Alternative, this fact will be understood by the Ministry of Transport as a major impetus for an immediate update to the Transport Sectoral Strategies.

61.1.2 Access to other parts of the road TEN-T network and other expressways without concrete awarded financial allocation in the period of 2014 – 2020 according to the Proposal variant

Motorway D3 in the Central Bohemian region (cluster CS005P, projects S187 – S191): At present, the projects in this cluster are not prepared to such an extent that their implementation could be considered in the period of 2014 – 2020. This cluster logically connects one of priority clusters - "D3 in the South Bohemian Region" (CS006P) which is proposed for the period of 2014 – 2020 for implementation to a motorway network in the area of Prague. Evaluation of cluster CS005P - „Motorway D3 in the Central Bohemian Region" ended - in comparison with other suggestions and projects - relatively positively (band of evaluation 14). Therefore, it is crucial that investment preparation continues and the project is - in the following updates of the schedule of Transport Strategies - included for implementation within concrete dates, taking into account the state of implementation of other higher-priority clusters. At present, implementation of this cluster is expected in the period of 2020 – 2035. With regard to a remoter horizon of implementation and with regard to actual very bad condition of traffic on the current road I/3 - especially in the section Mirošovice - Benešov, which D3 temporarily substitutes, in the period of 2014 – 2020 there is allowed for implementation of traffic-safety measures on this section (measures for traffic in the regime 2+1 lane).

Ring road around Prague (SOKP, Pražský okruh, R1): Project R1 511 Běchovice – D1 (cluster CS010P, project S200) obtained within the scope of Transport Strategies, within the scope of evaluation of road measures, one of the best bands of evaluation (3). However, this project has not been included in the schedule of implementation for the time being as the project with preliminarily awarded allocation of resources of the Cohesion Fund, but its financial coverage is matched (paired) to the available national sources. The reason being uncertainty regarding a possible date of commencement, for preparation of this project has been encountering many administrative complications over a long period. Currently (May 2013), the nearest possible commencement is expected in 2018 (optimistic expectation). Implementation of the project is therefore expected in the Proposal variant of funding from national sources from 2018. In case development of implementation of projects within the Cohesion Fund (priority projects of the Cohesion Fund) proceeded in the way that absorption capacity of the Cohesion Fund enables to include and implement this project with the use of such sources, then it is a possibility which should be made use of and taken into consideration in further updates of the schedule of implementation of the Transport Strategies.

Similarly complicated approval processes are also in other parts of SOKP, especially in the section of Březiněves – Suchdol (cluster CS012P, projects S198 and S199). Even though this cluster obtained a good band of evaluation (9), commencement of its implementation cannot be expected - for the said reasons - before 2020.

Currently, the route of the ring road around Prague is not determined in the Principles of territorial development of the capital city of Prague (legal proceedings for lawfulness of the determination stated in the ZÚR /Territorial Development Policy Document/ of the Central Bohemia Region, which the ring road partially stretches to, are now pending). The routing is being reviewed by the Municipal Authority of the Capital City of Prague as part of review no. 1 of ZÚR that is currently being prepared. At the moment when the route is determined in ZÚR, it is necessary to immediately and intensively prepare individual parts of Prague ring road in relation to the procedure in approval processes. For the purpose of diverting at least a part of transit transport from the area of Prague in the short-term horizon, there will be - in the period of 2014 – 2020 - implemented with priority the structure of „I/16 Slaný – Velvary“, which will enable to divert strong transit in the direction of D8 – D1 outside of a built-up area of Prague with the use of other already existing parts of infrastructure even without existence of such necessary parts of Prague ring road (R1).

Expressway R3 (cluster CS4007P, projects S134, S135, S136): This cluster - evaluated in the section of Třebonín - state border - follows up to one of the priority clusters „D3 Úsilné – Třebonín“. By implementation of this cluster there would occur necessary improvement of quality of connection of the whole of the South Bohemia region to an economically important area of Horní Rakousko /Upper Austria/ . The very evaluation of this cluster, however, in comparison with other evaluated clusters within the scope of the CR, did not show a necessary priority in the proposed technical solution and amount of costs which are currently followed/pursued (R 25,5/120). For this purpose, to enable implementation of the cluster, its technical-economic parameters must be reassessed so that it could be repeatedly evaluated with the potential of better results in the subsequent update of Transport Strategies. Currently (May 2013), they are already in the public procurement process with respect to designing and engineering works for sections 0311 and 0312/I (Třebonín – Kaplice, nádraží /station/– Nažidla). Performance of these public contracts is prepared in the way that in the first phase technical-economic parameters will be reassessed within the Technical-economic study and subsequently detailed designing - at the level of DSP - of a technical solution corresponding with the economic efficiency will be done. In selecting the technical-economic efficient variant, it will be necessary to assess more positively those proposals which will enable to make use of already issued planning permissions for such constructions. Border section 0312/II (Nažidla – state border CZ/A) must be adjusted - in technical aspects - especially by coordination with Austria. For this purpose it is appropriate, after the issuance of the planning permission, to coordinate - in technical aspects - the projects on both sides of the border and subsequently to prepare an international treaty on a border point (concrete border stones). In case that the Austrian side is interested in implementing the border section in the near period, then it will be necessary - within R3 - to implement with priority at least the section of 0312/II (approx. 3.5 km) by which both countries will be interconnected in a definitive point which does not correspond with the position of today’s border crossing. Technical solution of the section of 0312/II will be adapted to a mutual international treaty with Austria and to a technical solution of sections 0312/I and 0311. Implementation of individual parts of R3 in provably economically efficient technical parameters may be considered - with regard to provable relation to priority cluster "D3 in the South Bohemian Region" and its cross-border importance - as another potential projects in case of sufficient absorption capacity of the Cohesion Fund (in case of any different development of prices of priority projects or in case of any different development of the CZK/EUR exchange rate).

R4 Skalka – Mirotice (cluster CS015P Skalka – intersec.II/118, project 131, cluster CS4015P intersec. II/118- Mirotice, projects S129, S130 S132, S137): By implementation of this cluster, there will be interconnection of two existing capacity parts of road R4 and road I/20 (implemented in the section of Nová Hospoda - Písek also in a directionally separated four-lane arrangement). Evaluation of the cluster, however, in comparison with other needs did not show a necessary high band of evaluation for enabling priority implementation of this cluster. The cluster, moreover, is not part of TEN-T and resources for the implementation thereof are thus very limited. Previous parts of R4 and follow-up construction of road I/20 were implemented in the category of R22,5/100. The missing parts of R4 are currently prepared as R 25,5/100 (with the exception of section R4 Skalka – II/118 which is also prepared for implementation as R 22,5/80). With regard to the achieved band of evaluation, it will be necessary to proceed - in missing sections of R4 - to an economically more efficient solution consisting e.g. in implementation of missing parts in a newly introduced norm category of R 21,5/100 according to valid ČSN 73 61 01/Z2, as implementation of these sections in other than four-lane variant would not bring provable improvement against the current state and would not improve sufficiently necessary connection of the Strakonice and Šumava regions and the western part of the South Bohemian region to Prague. Moreover, it is necessary to perceive a fact that higher user of R4 will persist until complete completion of the construction of the Central Bohemian D3 (remoter time horizon). However, even upon this completion of the construction - with regard to expected growth of intensities - expressway R4 in four-lane directionally divided profile will be utilizable, although with objective capacity reserve. For the funding of this cluster it will be necessary to make use of sources awarded beyond the scope of the Proposal variant, since the sources in this variant are not sufficient for the coverage of its construction within 2014 - 2020.

R6 Nové Strašecí – Karlovy Vary (cluster CS4016P Nové Strašecí – intersection with I/27, containing projects S139, S140, S141, S142 and cluster CS4017P intersection with I/27 – Karlovy Vary containing projects S143 – S148, S371). Evaluation of these clusters in category R25,5/120 did not turn out sufficiently positively in comparison with other clusters within Book 8 in order to justify priority implementation of the projects herein mentioned over implementation of other, better evaluated plans. For the purpose of enabling implementation of the cluster, a feasibility study has already drawn up for the whole route in parallel with development of Transport Strategies, recommending the variant with an optimized capacity for preparation and implementation. After its technical-economic parameters had been reassessed, band of evaluation 14 was reached which justifies implementation of individual parts of the concerned clusters in the period of 2014 – 2020. Whole missing section R6 between two of its already operated parts is a part of the TEN-T comprehensive network. Concurrently, it stands that the current class I road has a number of point defects. Partial parts of route R6 are thus monitored as another potential projects in case of sufficient absorption capacity of the Cohesion Fund (in case of any different development of prices of priority projects or in case of any different development of the CZK/EUR exchange rate). For the purpose of reassessment of technical-economic parameters, there has already been assigned a feasibility study of the whole route R6 in this missing section. On the basis of its results, there will be reassessment of the clusters involved within the scope of the next update of Transport Sector Strategies in an attempt to enable to commence implementation before 2020 of at least a part of measures for improvement of parameters of the current connection. Implementation of measures on R6 is not financially covered within the scope of awarding the finances according to the Proposal variant.

R7 Slaný – MÚK Bítozeves (cluster CS019P, projects S149, S150, S151, S152, S153 and S375): The cluster showed within the scope of evaluation of Transport Sector Strategies a relatively good band of evaluation (14), which would justify its implementation in case of increased financial frames. With regard to the fact that expressway R7, however, is not part of TEN-T, and concurrently there are projects with a better band of evaluation, these results do not enable coverage of implementation from available resources according to the Proposal variant of funding. However, the fact being that this communication improves quality of connection of structurally affected regions of the Chomutov, Žatec and Most regions to Prague, and implementation of the expressway may be - in combination with the whole number of other necessary measures outside the transport sector - one of the tools within the impulse for economic development of this region. Currently, the missing route is predominantly designed in category R25,5/120, since a lower category of the expressway was not admissible at the time of designing. Predominant part of road I/7 in this section, however, was already built in the past as a half profile of the expressway of category R 22,5/100 which does not comply wholly - in terms of capacity and safety - with requirements. Through a study it will be checked whether by redesigning to a newly introduced norm category R 21,5/100 according to valid ČSN 73 61 01/Z2 it would not be possible to better use the existing built-up half profile and to achieve other effective savings. Individual parts of expressway R7 are a suitable candidate for being implemented in case finances are awarded beyond the framework of the Proposal variant of financing. The segment between the existing end of R7 near Slaný and MÚK (split level junction) with I/16, taking into account the plan to route the transit transport in relation D8 – D1 along this road (for details see the summary of recommended projects herein above).

Measures to increase safety in the Praha – Slaný segment of R7 (especially adaptations of MÚK without any slip and turn-out lanes) also show to be necessary.

R11 Jaroměř – state border (cluster CS4021P, containing projects S185 and S186): Evaluation of the cluster in comparison with other needs did not show a necessary high band of evaluation for enabling priority implementation of this cluster only on the basis of results of MMA. At the same time, its preparedness does not enable commencement of implementation earlier than in the year 2018. The cluster was evaluated in Book 8 within considered technical parameters of R25,5/120 (in 2010 already reduced from R27,5/120). The cluster is concurrently a part of the TEN-T core network. Interest of the CR - according to the schedule of implementation of Transport Strategies - being to implement in 2014 - 2020 the previous immediately following part of motorway D11 with the use of CEF resources (in case of award of support) - implementation of the section of motorway D11 already according to the prepared proposal of a CEF regulation falls under the border section. Within the framework of an application for CEF resources for D11, postponement of implementation of expressway R11 indefinitely (within a period after 2030) will not be tenable, for thereby there would not be completed the whole border section D11/R11 as is defined in the proposal for CEF Regulation. Knowing these facts, there was proceeded already in 2012 - in relation to the missing section R11 - to study verification of technical economic parameters of expressway R11 with the aim of achievement of provably tenable economic efficiency of the whole border section Hradec Králové - state border - Nowa Sól (PL). Not insignificant fact being that preparedness of the follow-up project S3 in Poland is better than in case of Czech R11, and thus there may be expected an increased interest in the implementation also on the Czech side. Concurrently it pays that road I/16 which is situation at the place of the future border crossing and copies de facto the future R11, does not enable - in case of non-completion of the project of R11 on the Czech side - to divert to this road - even temporarily - freight transport above 12 tons. Parameters of the current road I/16 in the section of the state border - Trutnov are not satisfactory for this traffic at all, nor can any part adaptations on this road change the given condition. According to available funds, it is thus desirable - in case of their lack - to implement with priority the section R11 1109 Trutnov – state border. The current road I/37 in the section Trutnov - Jaroměř which is to be replaced by the section R11 1108 would enable diversion of traffic of heavy freight transport during a very limited time after the carrying out of part technical measures. With regard to these facts stated, the implementation of the cluster of expressway R11 is expected in the first half of the years 2020 - 2035 within such technical parameters which will enable to prove the economic efficiency of its implementation.

R35 Ostrov – Staré Město – Mohelnice (cluster CS237P Ostrov - Opatovec, projects S295 – S298, cluster CS2385P Opatovec – Staré Město, project S299 and cluster CS184N Staré Město – Mohelnice, project S343): Evaluation of clusters turned out - in comparison with others - very positively especially in the section Ostrov - Opatovec where there is achieved a band of evaluation 3 - the best achieved band of evaluation of the cluster from the viewpoint of needs. In the section Opatovec - Staré Město there is achieved a band of evaluation 13, or in the section Staré Město – Mohelnice the band of 14. A relatively lower band of evaluation with these sections is given primarily by qualitative parameters of the current class I road which the expressway is to replace. In spite of this fact, however, priority implementation of R35 in the whole section is provably justifiable from the viewpoint of the need of completion of the parallel route between Bohemia and Moravia. Currently, however, the projects contained in these clusters are still in the initial stage of preparation, especially with regard to the longer discussion of the EIA process which, however, was successfully completed in 2012 in the section Ostrov - Staré Město by issuance of a consenting opinion of MŽP. In the section Staré Město – Mohelnice, the EIA process is not still completed. For the said reasons of insufficient investment preparedness of these sections it is not possible to reserve financial allocation of EU sources for implementation of all these projects in the period of 2014 - 2020, for the drawing of available EU sources must be primarily commenced in the first half of this period. With regard to prove priority need of implementation of the said projects, it is, however, necessary that their financing is secured immediately after completion of preparation with priority before implementation of other sections (follow-up of these projects to previous cluster Opatovice n. Labem - Ostrov which are proposed for funding within the Cohesion Fund). In case of sufficient absorption capacity of the Cohesion Fund at the time these projects are prepared, it is possible to secure the funding with the use of this source. Otherwise, it will be necessary to secure the funding of the projects in a different manner.

Tentatively, the Proposed Variant of Funding includes allocated national-level resources from 2017 onwards – the optimistic readiness date. The possibility of debt financing or a PPP project cannot be ruled out entirely.

R35 Hradec Králové – Úlibice – Turnov (clusters CS022P Hradec Králové – Jičín, projects S154, S287, S288, S289; CS182N Jičín – Turnov, project S478): Activity is in progress in the sections between Hradec Králové and Úlibice towards gradual acquisition of all the zoning decisions and justification of the economic effectiveness of the entire trunk road. However, the existing I/35 road in this section does not show any major transport defects, with the exception of the connection to the I/16 in the Úlibice area and the Ostroměř through road. Due to other, more important priorities in terms of needs and the inclusion of this section in the TEN-T comprehensive network, the implementation of the comprehensive cluster in 2014-2020 is not expected. The existing I/35 road between Úlibice and Turnov is routed inadequately, but the traffic volumes on it, including the long-term outlook, do not justify the construction of a four-lane road. A feasibility study will therefore be built to assess alternative technical design in terms of territorial possibility and expected user demand. As a follow-up on the outcome of the feasibility study, investment preparation will continue to allow implementation in the longer term. Until then, the suitability of implementation of some partial measures on the existing I/35 in this section cannot be ruled out (such as elimination of at-grade railway crossings, safety improvement elements).

R43 Troubsko – Staré Město (clusters CS025P Troubsko – Kuřim, project S165; CS4199aN Kuřim – Svitávka, project S322; CS199bN Svitávka – Staré Město, project S321): In relation to these clusters, or projects, it is necessary to primarily secure their unquestionable territorial stabilization in the Principles of territorial development of the South Moravian Region. In the northern part in the territory of the Pardubice region, the route is territorially stabilized. After that, it is necessary - within the scope of territorially defined corridors - to carry out evaluation of concrete routing within the EIA process. Consenting opinion of MŽP within the EIA process was issued for the time being only in relation to project S322 (Kuřim – Svitávka). With regard to expectable complications in the course of investment preparation of these projects and with regard to results of evaluation of the clusters concerned in Book 8, it is not allowed for the implementation of these projects in the period of 2014 – 2020. Within the scope of preparatory works, it is necessary to choose a tenable technical-economic solution of the whole route. Traffic defects of the current class I road, however, require a solution in the short-term horizon. For the said reason, there are preferred - within the schedule of implementation for the period of 2014 - 2020 - two projects which will help to temporarily improve a bad traffic-safety situation on the current network before implementation of the very expressway R43, or individual parts thereof. It concerns implementation of projects S310 (I/42 Velký městský okruh /Big municipal ring road/, Žabovřeská I.) and S058 (I/43 Hradec nad Svitavou – Lačnov, which will form the bypass of the town of Svitavy). Unquestionable in this respect is also a need to carry out part traffic-safety measures within the framework of the whole route of road I/43 in the section Brno - Svitavy.

R43, at present, cannot fulfil the role of a project to increase the fund absorption capacity, because it is not ready for investment. Due to that, other projects that are more ready are proposed for the absorption capacity increase, although their importance within the system is found to be less than the need for a new road route between the D1 and the I/35 (R35).

R48 Bělotín – Rybí – Rychaltice (cluster CS027P, projects S156, S157): Evaluation of this cluster in comparison with other clusters within Book 8 did not show sufficiently good results that would justify priority implementation of the projects herein mentioned over implementation of other, better evaluated clusters (band of evaluation 38). This also applies in case there is proved economic efficiency of their implementation with the said projects. For the purpose of increase of traffic-safety parameters, it is necessary to propose in the initial phase other measures for the implementation within this route than is reconstruction of directionally undivided four-lane communication I/48 to directionally divided expressway within technical parameters of R 25,5/120. Priority needs of improvement of parameters of transport infrastructure of the CR being on other sections of the network. For the said reasons the implementation of these projects is not proposed for the period of 2014 – 2020 in Proposed Variant of Funding.

R49 Hulín – state border (cluster CS029P Hulín – Lípa 2nd stage, projects S379, S214, S215 and cluster CS030P Lípa – state border, projects S216, S217, S218): Cluster CS029P has a relatively good band of evaluation (13) enabling its priority implementation. Cluster CS030P showed in Book 8 even in case of evaluation of a capacity-limited proposal (against the project-followed variant of expressway in parameters of R25,5/100) a band of evaluation 23. The whole section R49 is, however, a part of the TEN-T core network with the need of completion by 2030 according to the proposal for the regulation. Project Hulín – Fryšták is before termination of investment preparation. For the implementation of the project there has already been selected a contractor. With regard to the said facts, the projects of this cluster are included in priority ones for the period of 2014-2020. Expectation of commencement of implementation of the project Hulín - Fryšták is from 2014 according to rules for eligibility of expenditures within the Cohesion Fund for the years 2014 - 2020. For the purpose of enabling implementation of cluster CS030P Lípa – state border by the year 2030 (TEN-T core network) , its technical-economic parameters must be reassessed so that it could be repeatedly evaluated with the potential of better results in the subsequent update of Transport Strategies. In sections Fryšták – state border there may be expected according to the current proposal for the CEF Regulation possible co-funding of these constructions from the cohesion part of the CEF fund (border section)[26].

It was agreed with the Slovak party in the cross-border negotiations under the SEA process that the specific environmental impacts of this section (migration corridor for large mammals) will be handed at the EIA project level.

R52 Pohořelice – state border (cluster CS031P, projects S002, S003, S004): Evaluation of construction in this cluster did not turn out in comparison with other clusters positively (band of evaluation 24). However, when evaluating the capacity-limited proposal, the project already shows evaluation 14, which would justify its implementation. Judgement of the Supreme Administrative Court by which there were cancelled Principles of Territorial Development of the South Moravian Region confirmed that following this corridor due to quality road connection with Austria is correct, as it is in accordance with the Policy of Territorial Development of the CR 2008 (judgement 1 Ao 7/2011 – 526). On the basis of Government Resolution No. 735 of 9 June 2008 there was concluded an international treaty with Austria on 23 January 2009 on the place of connection of the communication of the motorway type in the area of the border crossing Mikulov (Collection of international treaties No. 40/2009). The last resolution of the government confirming the routing of R52 being resolution No. 713 from 6/10/2010. Currently, it is necessary to territorially stabilize the future route of the expressway, which predominantly makes use of the corridor of the current road I/52, in the Principles of Territorial Development of the South Moravian Region. Until then, it is not possible to fully continue in investment preparation. In relation to results of evaluation of the cluster in Book 8 and in relation to technical-economic parameters which are hitherto followed (R 25,5/120), it is necessary - until further update of Transport Strategies - to check possibilities of the implementation of the project in cost-saving parameters so that such reassessed proposal of the cluster could be repeatedly evaluated with the potential of better results. Route is part of the TEN-T core network, and therefore it will require improvement of parameters corresponding with requirements of the proposal for a TEN-T Regulation by 2030. Current road I/52 in the section Pohořelice - state border is with its parameters a very quality class I road which was put into operation in 1996. In this respect, it is not desirable to follow implementation of construction of any other provisional solution. Within the

[26] amount of means in the cohesion part of CEF intended for the funding of sections of the main road network of TEN-T with a border character is, however, considerably limited and all is allocated to construction of D11 Hradec Králové – Jaroměř. However, it is desirable to prepare Project R49 in the Fryšták – Lípa segment as a substitute one.

framework of the route study which will verify technical-economic parameters, it is therefore necessary to assess solely a possibility of construction of the definitive four-lane, directionally divided communication, e.g. in parameters of the newly introduced norm category R 21,5/100 according to valid ČSN 73 61 01/Z2. The subject-matter of the proposal of the technical-economic study should also be an approach to the possibility of crosswise phasing of the implementation of the cluster which will enable to remove with priority the point defects of the current route (level intersections, through road via suburb of Mikulov), or rather will enable to separately implement that section by which R52 will be interconnected with the Austrian motorway A5 at the place of the definitive border point in mutually agreed technical parameters.

For the said reasons, priority implementation of this section in the period of 2014 - 2020 is not proposed. However, it is necessary to intensively continue in the preparation of individual projects with the aim of enabling implementation of such measures by which the route will comply with the requirements of the proposal for a TEN-T Regulation in the period by 2030 (TEN-T core network). The cluster, or its individual projects, could be financed from the cohesion part of the CEF fund with regard to the fact that it concerns a border section. However, the precondition is timely and valid readiness of these projects.

R55 Olomouc – Přerov – Hulín – Otrokovice – Staré Město – Břeclav (cluster CS032P Olomouc - Přerov, projects S204, S205; cluster CS033P Otrokovice, bypass JV – Moravský Písek, projects S062, S206- S209; cluster CS034P Moravský Písek – Rohatec, projects S210, S211; CS035P Rohatec – Břeclav, projects S212, S213): In relation to the whole missing section R55, there is being prepared now a route study which will verify technical-economic parameters of the pursued route and will recommend solutions for further elaboration of individual projects. Route R55 is part of the TEN-T comprehensive network with the need for completion by 2050. Cluster CS033P Otrokovice, bypass JV – Moravský Písek is in a good band of evaluation (14). Structure S062 Otrokovice bypass – JV is - with regard to the good state of investment preparation - included in priority constructions in the period of 2014-2020 with the use of the sources of the Cohesion Fund with the planned date of commencement of implementation in 2015. By implementation of the project S062 Otrokovice bypass - JV there is not forecast any running of the route in the next parts of the route R55 lying to the south of Staré Město. Any change of the route in these sections - forced by requirements for protection of the environment - will not be excluded by the implementation of the bypass of Otrokovice, for any such diversion of the route may be dealt with within the framework of a follow-up to other prepared sections.

With projects in other sections of the cluster Napajedla - Moravský Písek, or with clusters CS034P Moravský Písek – Rohatec and CS035P Rohatec – Břeclav, there is expected - with regard to the hitherto non-completed investment preparedness and the available amount of financial resources according to the Proposal variant - implementation of other parts of the cluster during 2020 - 2035, or in the horizon after the year 2035. Cluster CS032P Olomouc – Přerov must be evaluated in further updates of Transport Strategies in the context of completion of sections of motorway D1 around Přerov. Now it is important for the investment preparation to continue in technical-economic tenable parameters while observing provably justifiable requirements for protection of the environment. More specific dates of implementation will be determined in relation to the procedure in implementation of clusters with higher priority, or in relation to completion of preparation of the compact parts of clusters R55.

At present, the R55 cannot fulfil the role of a project to increase the fund absorption capacity, because it is not ready for investment. Due to that, other projects that are more ready are proposed for the absorption capacity increase, although their importance within the system is found to be less than the need for a new road route between Rohatec and Napajedla.

61.1.3 Railway projects with the commencement of implementation by the year 2020 with financial coverage according to individual available financial resources in the Proposal variant of funding

Constructions on TEN-T implemented within OPD I with completion by the end of the year 2015				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Modernization of the line Ševětín - Veselí nad Lužnicí - 1st part section Ševětín-Horusice	8	998	2013-2015	The given projects will be implemented with the use of resources of the current Operational Programme Transport for the years 2007-2013 – priority axis 1. It concerns projects which are already being implemented, and the projects the implementation of which will be commenced. With these events there is expected use of rule n+2, which means that their implementation via the current OP Transport is possible with their expected completion in 2015. It concerns projects which are part of priority clusters analyzed in Transport Sector Strategies. At the same time, on the TEN-T network there will be also implemented other part measures for improvement of parameters of operation of railway transport which either are not at present specified by name, or which financial resources does not reach the amount of 300 mio CZK VAT exclusive These projects are not mentioned herein. The aim of the implementation of these events being primarily to secure to use up allocation of OPD by implementation of measures with an added value for the operation of railway transport on key parts of the network.
Modernization of the line Veselí n.L.-Tábor-IInd part section Veselí n.L.-Doubí u Tábora, 1st stage Veselí n.L. - Soběslav	8	1,550	2013-2015	
Optimization of the line Praha Bubeneč - Praha Holešovice	12	983	2012-2015	
Optimization of the line Cheb (outside) - state border of SRN /Germany/, 1st part	77	537	2014-2015	
Reconstruction of the railway st. Přerov, 1st construction	-	3,967	2009-2014	
Modernization of the line České Budějovice - Nemanice I	-	1,012	2011-2014	
Plzeň passage through the junction in the direction of III. TŽK	-	1,310	2011-2014	
Reconstruction of the railway junction Břeclav 2nd	-	1,032	2012-2015	

construction				
Passage through the railway junction Ústí nad Orlicí	-	1,182	2012-2015	
GSM-R Kolín - Havlíčkův Brod - Křižanov - Brno	-	675	2013-2015	
Reconstruction of station tracks and point switches of the railway st. Strakonice	-	810	2013-2015	
Reconstruction of the railway st. Horažďovice předměstí	-	642	2015	
Reconstruction of track No.2 Brno Maloměřice – Brno Královo Pole	-	681	2014-2015	
Reconstruction of track no.2 Brno Královo Pole – Kuřim	-	620	2014-2015	
GSM-R junction Praha (Beroun - Praha – Benešov)	-	386	2014-2015	

Constructions outside of TEN-T implemented within OPD I with completion by the end of the year 2015				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Modernization of the line Hradec Králové - Pardubice - Chrudim, 1st construction carrying out of double-track line of the section Stéblová - Opatovice nad Labem	1	998	2014-2015	The given projects are prepared for implementation with the use of resources of the current Operational Programme Transport for the years 2007-2013 – priority axis 3. It concerns projects which are already being implemented, and the projects the implementation of which will be commenced. With these events there is expected use of rule n+2, which means that their implementation via the current OP Transport will be also possible
Reconstruction of the line	12	878	2013-2015	

Liberec - Tanvald				with projects the implementation of which will be completed in 2015. With regard to risks of preparation and selection of contractors of building works there cannot be excluded that with some projects it will be necessary to make use of the possibility of phasing or they will be implemented later. There are not mentioned any measures by name with the amount of costs below 200 mio CZK exclusive of VAT the implementation of which is also expected with the aim of securing maximum use up of allocation of OPD with the concurrent use of such resources for important regional routes with the potential of a stable order of transport.
Reconstruction and increase in capacity of the line Studénka-Mošnov	21	429	2013-2014	
Increasing capacity of the line Týniště n.O. - Častolovice - Solnice, 1st part, reconstruction of platforms of railway st. Týniště n.O.	31	210	2014-2015	
Increasing capacity of the line Týniště n.O. - Častolovice - Solnice, 2nd part, reconstruction of railway st. Častolovice	31	467	2014-2015	
Revitalization of the line České Budějovice - Volary	76	1,640	2013-2015	
Electrification of Kadaň Prunéřov - Kadaň předměstí	77	431	2014-2015	
Revitalization of the line Praha Smíchov - Rudná u Prahy - Beroun	-	716	2014-2015	

<table>
<tr><th colspan="5">Constructions on TEN-T proposed for implementation within OPD I with expected phasing and completion in 2016</th></tr>
<tr><th>Project name</th><th>Band of evaluation of a cluster according to Book 8</th><th>Costs [mio CZK VAT exclusive]</th><th>Implementation expected from - to</th><th>Note, importance of projects, risks</th></tr>
<tr><td>Modernization of the line Tábor - Sudoměřice u Tábora</td><td>8</td><td>2,057</td><td>2013-2016</td><td rowspan="9">The given projects will be implemented through the current Operational Programme Transport for the years 2007-2013 – priority axis 1. It concerns projects which are already being implemented, and the projects the implementation of which will be commenced. With these events there is expected use of rule n+2, which means that their implementation via the current OP Transport will be also possible with projects the implementation of which will also take place in 2015. With these projects, however, there cannot be expected with certainty or a large extent of probability completion of implementation by the end of the year 2015. Certain phase of these projects will have to be also implemented after the year 2015 with the use of resources of the Cohesion Fund from OPD II. With regard to risks in preparation of constructions and in selection of contractors there cannot be excluded that implementation of some phases of projects will extend beyond the year 2016. However, there has to be an attempt to minimize the extent of phases which already make use of the resources from OPD II.
These are primarily projects that will contribute to the main objective of the implementation for the period 2014-2020, that is, the completion of the system of transit railway corridors. They are sections of major railway lines not upgraded so far, which constitute bottlenecks within the network causing major speed drops and negative impacts on the theoretical graph of train</td></tr>
<tr><td>Modernization of the line Ševětín - Veselí nad Lužnicí - 2nd part section Horusice - Veselí n.L.</td><td>8</td><td>2,260</td><td>2013-2016</td></tr>
<tr><td>Reconstruction of track no.1 a no.2 Sklené nad Oslavou - Ostrov nad Oslavou</td><td>-</td><td>988</td><td>2014-2016</td></tr>
<tr><td>Modernization of track section Brno Maloměřice (incl.) – Brno Židenice (outside)</td><td>-</td><td>800</td><td>2014-2016</td></tr>
<tr><td>Modernization of track section Modřice (outside) – Brno Horní Heršpice (outside)</td><td>-</td><td>300</td><td>2014-2016</td></tr>
<tr><td>Reconstruction of a safety device of railway st. Lovosice</td><td>1</td><td>673</td><td>2014-2016</td></tr>
<tr><td>Optimization of the line Praha Hostivař - Praha hlavní nádraží, 1st part</td><td>8</td><td>1,214</td><td>2014-2016</td></tr>
<tr><td>Modernization of the track section Praha Běchovice - Úvaly</td><td>12</td><td>2,205</td><td>2013-2016</td></tr>
<tr><td>Optimization of the line Bystřice n.O. - Č. Těšín 2nd construction</td><td>38</td><td>1,399</td><td>2013-2016</td></tr>
</table>

of railway st.Český Těšín				running. The project implementation will increase the line capacity in all the cases, which has been proven necessary in these places based on the Book 6 analysis.
Optimization of the line Český Těšín - Dětmarovice	38	2,798	2014-2016	
Junction Plzeň, 1st construction - reconstruction of the Prague deviated tracks	51	2,943	2014-2016	
Reconstruction of the railway st. Olomouc	-	2,311	2013-2016	
Modernization of the line Rokycany - Plzeň	-	5,630	2013-2016	
Reconstruction of tract Ostrov nad Oslavou - Žďár nad Sázavou, 1st part	-	700	2014-2016	

Constructions outside of TEN-T proposed for implementation within OPD I with expected phasing and completion in 2016				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Increase in capacity of the line Nymburk – Mladá Boleslav, 1st construction	61	727	2014-2016	Same as the phased projects in the TEN-T network. Given the risks, a major shift in the implementation start date and funding only under OPT II cannot be ruled. This is a very important line for freight traffic used for logistics by the Czech Republic's biggest car manufacturer.
Revitalization of the line Klatovy - Železná Ruda	76	900	2014-2016	An important project for regional transport with a potential for increasing passenger traffic.
Reconstruction of the Negrelli viaduct	-	992	2015-2016	An invariant component of the project to upgrade the connection between Prague, Václav Havel International Airport and Kladno.

Modernization of safety and communication devices as a condition of securing interoperability of statewide lines (incl. ETCS / GSM-R and constructions DOZ)				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation from - to**	**Note, importance of projects, risks**
CDP Praha	-	According to the concept of CDP	According to the concept of CDP	In the course of preparation of Transport Strategies there was not available a final version of the concept of the Central Traffic Control Department in Prague and thereto exactly defined track sections on which there will be controlled traffic from this central traffic control department Exact definition of individual track sections for preparation of the relevant project DOZ and thereto given total investment costs and dates of implementation will be known in the course of the year 2014. Preparation and implementation of these projects will take place according to a fixed concept and paid from financial resources from the relevant package D.3 - Device for the control of traffic on the railway infrastructure. In case of acknowledgement of these projects for the cofunding from the EU, it turns out that the use of this source is possible.
DOZ I.TŽK, part Praha – Ústí nad Labem	-	According to the concept of CDP	According to the concept of CDP	
DOZ I.TŽK part Praha – Česká Třebová	-	According to the concept of CDP	According to the concept of CDP	
DOZ I. TŽK part Česká Třebová – Brno	-	According to the concept of CDP	According to the concept of CDP	
DOZ III. TŽK part Praha – Plzeň – Cheb	-	According to the concept of CDP	According to the concept of CDP	
DOZ III. TŽK part Ostrava – Mosty u Jablunkova	-	According to the concept of CDP	According to the concept of CDP	
DOZ IV. TŽK part Praha – Č. Budějovice – st.border	-	According to the concept of CDP	According to the concept of CDP	
DOZ Děčín – Všetaty - Kolín		According to the concept of CDP	According to the concept of CDP	
DOZ outside of TEN-T	-	According to the concept of CDP	According to the concept of CDP	

ETCS TEN-T		According to the national implementation plan ERTMS	According to the national implementation plan ERTMS	In the course of preparation of Transport Strategies, there was not available a final reviewed version of the National implementation plan ERTMS. The Czech Republic has a duty to implement ERTMS systems on lines of the European railway system. Preparation and implementation of these projects will take place according to the National implementation plan that will be in compliance with the Commission decision 2012/88/EC on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system as well as with the future TEN-T Regulation, and paid from financial resources from the relevant package D 3 - Device for the control of traffic on the railway infrastructure. With regard to the important European added value of these measures, it is desirable to apply for the EU resources for their implementation, especially from the CEF fund where introduction and support of development of interoperability is one of the horizontal objectives.
GSM-R TEN-T		According to the national implementation plan ERTMS	According to the national implementation plan ERTMS	

Constructions on TEN-T proposed for implementation with the use of resources from the CEF fund - cohesion part, in the period of 2014-2020 (2023)				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Optimization of the line Praha - Smíchov (outside) - Černošice (outside)	2	2,258	2015-2017	In the list of constructions which should be implemented from the CEF fund (like from its cohesion part) there were included constructions which meet the following criteria: a) the given constructions are situated on the TEN-T core network, and form part of the so called priority projects given in the annex to the proposal for a CEF regulation. b) it concerns projects which are in a sufficient extent of preparedness so that an application for their financing from CEF can be submitted to the European Commission in the course of the year 2016 at the latest (note: With regard to the fact that from 2017 the CR would have to compete for obtainment of the resources from CEF with other cohesion countries, it is necessary to concentrate on the using up of the so called national envelope of CEF in the period until 2016), and to prepare timely - on the basis of announced calls - applications for approval of the projects for CEF. These are primarily projects that will contribute to the main objective of the implementation for the period 2014-2020, that is, the completion of the system of transit railway corridors. They are sections of major railway lines not upgraded so far, which constitute bottlenecks within the network causing major speed drops and negative impacts on the theoretical graph of train
Optimization of the track section Praha hl.n. - Praha Smíchov	2	4,013	2016-2018	
Optimization of the line Černošice (incl.) - Beroun (outside)	2	4,350	2016-2018	
Optimization of the line Beroun (incl.) - Králův Dvůr	2	1,636	2015-2017	
Optimization of the line Praha Hostivař - Praha hlavní nádraží, 2nd part	8	4,750	2015-2017	
Optimization of the line Lysá nad Labem - Praha Vysočany, 2nd construction	12	8,250	2016-2018	
Junction Plzeň, 2nd construction - reconstruction of passenger station, including bridges Mikulášská	51	1,373	2016-2017	
Junction Plzeň, 3rd construction - transposition of the Domažlice line	51	1,737	2017-2018	

Reconstruction of the railway st. Přerov 2nd construction	-	2,283	2016-2018	running. The project implementation will increase the line capacity in all the cases, which has been proven necessary in these places based on the Book 6 analysis.

Constructions on the TEN-T proposed for implementation from the Operational Programme Transport II and from national resources in the period of 2014-2020 (2023)				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Modernization of the line Brno - Přerov, Ist stage Blažovice - Nezamyslice	7	24,213	2019-2023	These projects are - according to results of the Transport Strategies - evaluated as priority ones within the scope of the TEN-T network. Individual dates of implementation of these projects are determined on the basis of the knowledge of the state of their preparedness. Inclusion in the years is given by their priority, their preparedness and availability of financial resources in individual years due to a possibility of their continuous implementation. These events will be implemented through the Operational Programme Transport for the period of 2014 – 2020. As seen from this list of projects, there is a considerable risk that in case these constructions principal in terms of volume could not be implemented for various reasons, it will be necessary to implement a bigger number of events which are smaller in terms of volume. Thus, it is necessary to accelerate preparation of all projects which will serve for achievement of the objective - clearly confirmed by the government - of completion of transit railway corridors, including junctions. At the same time, it is necessary to also prepare substitute projects by detailed elaboration of suggestions with the highest potential up to the level of projects.
Modernization of the line Veselí n.L.-Tábor-IInd part section Veselí n.L.-Doubí u Tábora, 2nd stage Soběslav - Doubí	8	3,510	2015-2017	
Modernization of the line Sudoměřice u Tábora - Votice	8	5,999	2015-2018	
Modernization of the line Nemanice I - Ševětín (new line)	8	12,800	2017-2020	
Modernization of the line Ústí nad Orlicí - Choceň	18	14,924	2021-2024	
Railway junction Brno modernization of passage and Ist part of passenger station	-	20,411	*2018-2024*	

				A considerable risk of all constructions stated being, of course, processes in permitting individual constructions which may lead to postponement of dates of implementation. However, it is desirable that from the side of the investor a maximum has been done for fast preparation of such measures. Some of the projects may see a rethinking of their scope based on the execution of feasibility studies.
Modernization of the line Praha - Kladno with connection to Václav Havel International Airport - Ist stage - 1st construction Praha Veleslavín - Václav Havel International Airport	-	9,600	2019-2022	The scope and phasing of the whole project will be specified on the basis of results of the feasibility study that is currently being drawn up, under which the whole area and transport service for this part of the agglomeration is addressed.

Constructions of railway junctions implemented from the fund of package Reconstruction and repairs of junctions including additional adaptations in the periods of 2014-2020 (2023)				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Passage through the railway junction Ostrava	38	6,000	2019-2021	For the compact functioning of the railway network it is crucial that apart from the main lines also the individual junctions are modernized. According to results of the Transport Strategies these railway junctions were also evaluated as priority ones within the TEN-T network. Individual dates of implementation of these projects are given by their priority and by their preparedness and availability of financial resources in individual years for the possibility of commencement of their
Modernization of the section Praha-Radotín - Praha-Vršovice seř.n.	-	2,125	2015-2017	
Increasing capacity of the line Praha-Libeň – Praha-Malešice – Praha-Hostivař / Praha-Vršovice	-	1,688	2016-2018	

seř.n.				implementation. These events will be implemented through the package Reconstruction and adaptations of junctions including additional adaptations. According to the current development of preparation of projects to which there were awarded - within the schedule of implementation of Transport Strategies - resources of the Cohesion Fund, it will be desirable to take into account a possibility of implementation of some of these measures with the use of these sources in case that these projects were prepared earlier and could make use of the allocation of the Cohesion Fund - principle of mutual interchangeability of the sources with priority projects eligible for financing. A considerable risk being, of course, processes in permitting individual constructions which may lead to postponement of dates of implementation. However, it is desirable that from the side of the investor a maximum has been done for fast preparation of such measures.
Passage through the railway junction Česká Třebová	-	5,994	2022-2024	

Constructions outside of the TEN-T proposed for implementation from the Operational Programme Transport II and from national resources in the period of 2014-2020 (2023)

Project name	Band of evaluation of a cluster according to Book 8	Costs [mio CZK VAT exclusive]	Implementation expected from - to	Note, importance of projects, risks
				According to results of the Transport Strategies these projects were also evaluated as priority ones which are not part of the TEN-T network. Individual dates of implementation of these projects are given by their priority, preparedness and availability of financial resources in individual years for the possibility of commencement of their implementation. These events will be implemented through the Operational Programme Transport for the period of 2014 – 2020. A considerable risk being, of course, processes in permitting individual constructions which may lead to postponement of dates of implementation. However, it is desirable that from the side of the investor a maximum has been done for fast preparation of such measures. The projects have a large potential for increasing traffic in passenger and freight transport, respectively.
Modernization and electrification of the line Otrokovice - Vizovice	26	3,415	2016-2019	
Electrification of the line, incl. PEÚ Brno - Zastávka u Brna	51	4,101	2014-2016	
Increase in capacity of the line Nymburk - Mladá Boleslav, 2nd construction	61	323	2015-2016	
Modernization and completion of railway st. Praha Masarykovo nádraží	-	1,000	2018-2020	
„Optimization of the line Ostrava Kunčice – Fr. Místek – Č.Těšín, incl. PEÚ and optimization of railway st. Č.Těšín, 1st part“(Frýdek-Místek - Dobrá u FM – Nošovice)“	-	2,971	2018-2021	

Substitute constructions for implementation from the Operational Programme Transport II and from national resources in the period of 2014-2020 (2023)

Project name	Band of evaluation of a cluster according to Book 8	Costs [mio CZK VAT exclusive]	Implementation possible from	Note, importance of projects, risks
Modernization of the line Brno - Přerov, IInd stage Nezamyslice - Přerov	7	12,235	2020	According to Book 8, the following projects in question also turned out to be the priority ones. In modelled award of expected available financial resources to individual constructions according to their priorities and preparedness, it was not possible to also secure - in the given period - financial coverage for these projects. With many events with awarded financial allocation in the period of 2014 – 2020(2023) there may occur - with a certain (high) degree of probability - a situation when: • there comes to reduction of the total costs of constructions due to reduction of the extent of a technical solution, • there comes to reassessment of the extent of the project on the basis of the feasibility study, • there comes to reduction of the total costs of constructions due to a lower price of the structure that has arisen from the tender procedure for a contractor of construction, • there is a delay in preparation of these constructions. • The CZK/EUR exchange rate in the concerned period will
Modernization of the line Brno - Přerov, IIIrd stage, Brno - Blažovice	7	7,082	2023	
Electrification and increase in capacity of the line Ostrava-Kunčice – Frýdek-Místek - Č. Těšín, incl. PEÚ and optimization of railway st. Č. Těšín, 2nd part	7	4,596	2018-2020	
Modernization of railway st. Nymburk hl. n.	21	950	2017	
Boskovická spojka (connecting link)	51	1,082	2018	
Modernization and electrification of the line Kojetín - Hulín - Holešov	51	3,500	2018	
Electrification and modernization of the line Olomouc - Uničov	52	1,737	2018	
Electrification of the line Tišnov - Nedvědice	53	560	2018	
Modernization of line Prague - Kladno with connection to Ruzyně Airport - IInd stage	-	4,700	2018	

Completion of Ist Railway Corridor in the track Section Lanžhot (ČR) - Kúty (SR)	-	600	2017	differ from what is expected in the budget For this reason, it is necessary to secure with these substitute events their preparedness so that they could be - in case of the said facts occurred - admitted for implementation.
Passage through the railway junction Pardubice	-	500	2018	
Increasing capacity of the line Pardubice – Hradec Králové, completion	-	2,169	2017	
Modernization of the line Plzeň - Česká Kubice, section Domažlice (incl.) - Furth im Wald (excl.)	-	6,000	2019	They currently include indicated suggestions with a high potential for elaboration during the project preparation. The assessment zone is not defined, because the IEF cannot be determined at present (3rd pillar). After completion of feasibility studies for these major railway lines included in the core TEN-T network, the sections will be executed based on the FS results and readiness of the sections for execution, and they will enter the next TSS2 update in this form.
Modernization of the line Plzeň - Česká Kubice, section Stod (excl.) - Domažlice (excl.)	-	7,000	2019	
Modernization of the line Plzeň - Česká Kubice, section Plzeň (excl.)-Stod (incl.)	-	6,000	2019	
Optimalization of the line Všetaty – Kolín	-	6,000	2017	
Optimalization of the line Děčín – Všetaty	-	6,000	2017	

Constructions by revitalization and reconstruction of regional lines financed from package C1 Securing system financing of maintenance, repair, reconstruction of railway transport infrastructure in the period of 2014-2020(2023)				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Revitalization of the line Veselí n.L. - Jihlava	12	4,000		According to results of Book 8, there also turned out to be as priority ones the events of a smaller extent, predominantly by revitalization and reconstruction of lines, especially regional lines with a considerable extent of ordered transport or operated freight transport. Even though enumeration of these events also includes statewide lines, it concerns - according to importance of lines and operation on them - events of a regional and local importance. It usually concerns events in investment demand amounting to hundreds of millions CZK, which is often - according to experience from economic evaluation of project plans - a maximum limit for the resulting positive economic evaluation of the plan with regard to operated numbers of trains and potential benefits. As appropriate there turns out to be - according to last experience with these projects - implementation of combined measures of investment construction along with non-investment construction, i.e. a measure implemented within the framework of maintenance and operability of the railway infrastructure. Date of implementation of these constructions is - with regard to the focus of required measures and importance of lines on performance of regional requirements - dependent on
Modernization of railway st. Jindřichův Hradec	12	1,100		
Reconstruction of the line Tanvald - Harrachov	12	270		
Revitalization of the line Jaroměř - Stará Paka	36	874		
Revitalization of the line Kostelec - Telč - Slavonice	46	402		
Revitalization (optimization) of the line Rumburk – Dol.Poustevna	46	78		
Revitalization of the line Děčín - Benešov n. Ploučnicí - Rumburk	46	534		
Revitalization of the line Rakovník - Beroun	46	986		
Revitalization of the line Krásný Jez - Horní Slavkov (branch line Sanaka)	46	62		
Revitalization of the line Horní Slavkov - Loket	46	200		
Reconstruction of the line	46	280		

Karlovy Vary - Mariánské Lázně				requirements of regional orderers of the regional public transport through plans of traffic services and on needs of providers of freight transport. Schedule of implementation of these measures should correspond with evaluation of these events in Transport Strategies and at the same time be adapted to requirements of the regions. Financing implementation of most of these projects must be secured through package C.1 - Securing system financing of maintenance, repair, and reconstruction of railway transport infrastructure.
Increasing load capacity Nymburk - Poříčany	47	160		
Revitalization of the line Nymburk - Poříčany	47	330		
Revitalization of the line Čelákovice - Brandýs n.L. - Neratovice	51	600		
Revitalization of Rokycany - Nezvěstice (increase of speed and securing crossings on line 175)	51	801		
Revitalization of the line Týniště nad Orlicí - Meziměstí - Broumov	61	1,716		
Revitalization of the line Červenka - Prostějov	61	779		
Revitalization of the line Olomouc - Senice na Hané	61	361		
Revitalization of the line Liberec - Frýdlant v Č.	61	550		
Revitalization of the line Chlumec nad Cidlinou - Trutnov	61	2,244		
Revitalization of the line Kunčice - Vrchlabí	61	88		
Revitalization of the line Česká Lípa - Litoměřice horní n.	61	546		
Revitalization and increasing capacity of Jičín - Kopidlno	62	350		

Each sub-project is of a specific nature. A detailed overview of the nature of each project is provided in its assessment under the 1st pillar of the MCA, which assessed how the project contributes to meeting the needs identified in Book 6. These detailed overviews are part of separate Reports or Books published on the project website www.dopravnistrategie.cz.

61.1.4 Access to other parts of the railway TEN-T network and other important parts of railway infrastructure without concrete awarded financial allocation in the period of 2014 – 2020 according to the Proposal variant of funding

The Czech Republic should make every effort to achieve the objective of completion of the TEN-T core network within a required time limit of the year 2030. Number of projects of the TEN-T core network will be - according to the schedule of implementation of Transport Strategies - implemented during 2014 - 2020, or it is expected that the projects will be commenced in this period and their implementation will be finished after 2020. This mainly applies to the following projects:

- Modernization of the line Brno – Přerov
- Railway junction Brno
- Modernization of the line Choceň – Ústí nad Orlicí

The remaining plans on the TEN-T core network were assessed in Transport Strategies as the so called suggestions. With these plans, it is necessary to prepare required stages of project documentation on the basis of which there may be determined corresponding proposal parameters of stipulated measures and these plans subsequently evaluated during the next update of Transport Strategies already as concrete projects. The following plans are concerned:

- Upgrading of the line Plzeň – Domažlice – state border CZ/D
- New line Praha – Lovosice
- Optimization of the line Děčín – Všetaty – Kolín
- Upgrading of the line Brno – Břeclav
- Optimization of the line Hranice na Moravě – Horní Lideč – state border CZ/SK

Along with the above-mentioned projects, it is necessary to also responsibly prepare projects on the TEN-T comprehensive network. In this case, it primarily concerns plans of construction of high-speed lines/fast connections, see the following chapter.

Projects of agglomerative and important suburban connections

In the last period, there significantly advanced a process of suburbanization, and thereby there are increasing requirements for the securing fast and capacity suburban transport. According to expectations of further society-wide development contained in Book 3, this trend may be also expected in future, especially in areas of important metropolises and regional cities (Praha, Brno, Ostrava, other regional cities). From the followed measures - with the aim of securing fast and regular capacity suburban transport - there are followed, with MoT, RIAand regions, plans of the type of electrification and increase-in-capacity of suburban lines. When evaluating these projects via the analysis of MCA, the results of evaluation of these plans - both in the group of projects, and in the group of suggestions - were mostly very good. From the viewpoint of transport, it is a logical result, for it concerns very important traffic flows amounting to several thousands of passengers a day. From the environmental point of view, in case of electrification it concerns a measure which has a favourable influence on the environment and in case of increase in capacity it concerns a measure having a relatively small negative influence on passability through the territory. These events are - as for investment demandingness - rather moderately demanding in terms of investment with a relatively good rate of benefits and costs from which follow also relatively good results in this pillar of evaluation. Within the framework of further designing and investment preparation, to these projects there must be paid fundamental attention just in relation to the securing of objectives arising from the European transport policy and a proposal for a regulation of TEN-T (after all, many parts of suburban lines being concurrently a part of TEN-T).

Number of projects of this character will be implemented by the year 2020 (2025) as stated in chapter 61.1.3. After the year 2020, it will remain to be implemented a number of suggestions which was justified by a multi-level multi-criteria evaluation and by the model of traffic prognoses. However, for the next update of Transport Strategies it is necessary to finish elaboration of required stages of pre-project preparation (feasibility study, project plans, see principles in chapter 5). Without securing these supporting documents, there cannot be evaluated all the suggestions at this moment in required detail in Transport Sector Strategies. With regard to very close traffic interconnection of individual suburban lines in relevant railway junctions, it is very desirable to prepare coherent feasibility studies as logical units capable of being financed. This principle has already been introduced in the area of pre-project preparation in the course of preparation of Transport Strategies (see chapter 5).

Railway transport infrastructure adjusted to needs of carriers; opening a market in long-distance and regional transport and related needs of improvement of parameters of infrastructure

System of operation of railways and traffic control must acquire - within RIA- such position that it creates - along with the existing Section of operation of railways - basic business place of RIAselling services of the transport route to carriers in passenger and freight transport and thus influences provision of services to customers. In the period of 2014 - 2020 and subsequently in the period after 2020 there is expected implementation of gradual opening of a market in the long-distance and regional railway transport. For the said reasons, there must be made necessary adaptations of the railway lines well in advance before conclusion of the contract for operation of public railway transport by a carrier selected in the tender procedure, on which such traffic is to be implemented. The meaning is that no fundamental interventions are carried out in railway lines on which there will be operated public railway transport on the basis of selection of a carrier according to principles of an open tender procedure. Necessary adjustment of railway lines - to enable an optimized extent of ordered transport - are mostly of a small character, and therefore it is desirable that such measures are implemented primarily from increased items of operability, or from available national sources which must be assigned to such measures within the framework of preparation of SFTI budgets.

Projects of regional and local railway connections

Regional and local railway lines often have specific importance given primarily by regional specifics and requirements. With regard to the focus of Transport Strategies, particularly on the infrastructure of statewide and international importance, it was not possible to work with these lines in corresponding detail so that it is possible to credibly assess required measures on these lines after the year 2020. Therefor it is necessary to stipulate requirements for these lines after the year 2020. As it concerns lines predominantly of regional importance, the key sources of these requirements will be Plans of transport services, concept of development of regions, concept of tourism and the like. According to these requirements, there will be prepared - with lines with the potential of development, in cooperation with MoT and RIA and regions - corresponding documentation / feasibility studies, on the basis of which there will be assessed feasibility and efficiency of required measures. With these lines, there is usually expected implementation in the form of revitalization, modernization of railway crossings, or reconstruction of stops and stations. In case of non-proving sufficient efficiency of required investment measures, it is - however - further necessary to secure sufficient maintenance and operation of such used lines.

With a number of local and regional lines, their future importance is, however, relatively low. According to the current and prospective trend of the extent of transport and possibility of funding of the order of such transport, there cannot be expected any turn. A number of these lines show a very low utilization of railway passenger and freight transport, in some cases there is even no transport operated on some lines at all. As part of project works, the need for reducing unused railway lines was indicated (Report 6.3 in Book 6). The issue will be addressed in detail in the Public Transport Conception (a follow-up document to Transport Policy) because usability of local lines is based on their possible role in the public transport system. Insufficiently used lines will be therefore identified in detail on the basis of detailed plans of transport service accessibility of regions. In case of proving further uselessness of the lines, it will be advisable to proceed to possible sell-off of the line, or cancellation according to valid rules. In this respect, the government adopted resolution No. 416/2012 defining a procedure in this matter.

61.1.5 Issue of fast supra-regional railway connections (concept of FC/HST)

In this area, the main task of the Ministry of Transport in cooperation with RIA for the period of the years 2014 - 2020 is to set tenable, society-wide acceptable and financially covered concept of development of supra regional railway transport (and the infrastructure necessary for that) for the period after the year 2020.

Implementation of projects of railway infrastructure in the period of 2014 - 2020 proceeds primarily from a justified need (Book 8) of the completion of transit railway corridors including railway junctions so that the railway corridors are compactly functional. In 2020 there should be already terminated a program of implementation of railway corridors in the form in which it was approved in the first half of the 90s of the 20th century.

However, a non-clearcut version, technical parameters and extent of new parts of railway lines did not enable - within the scope of preparation of Transport Strategies - to explicitly compare importance of implementation of concrete new measures outside of corridors. The reason is that there are not mostly available necessary inputs about these suggestions for evaluation (technical parameters, financial costs, influences on the environment, benefits). These parameters cannot be determined within Transport Strategies which serve primarily as a tool for mutual comparison of individual prepared measures and evaluation of their mutual importance.

In case of successful completion and approval of the concept of new railway connections for fast supra regional transport by the government, concrete investment preparation which will enable to objectively assess completed projects within the framework of update of Transport Strategies will be allowed to be commenced in the period of 2014 - 2020. In case of positive results, it will be possible to commence implementation of individual measures after the year 2020.

Territorial tracks for new railway lines - enabling operation with higher speed - have been territorially protected in many parts of the CR since 1995. The last update of the version of corridors of VRT was validly approved by the Ministry of Transport in 2003. Other necessary follow-up works, however, were not completed and successfully discussed.

In an attempt to explicitly grab the future version of the railway infrastructure for faster supra regional connection, the Ministry of Transport in cooperation with RIA - already in the course of preparation of Transport Strategies - proceeded to gradual necessary steps which will enable to create this concept and subsequently justify. The first step must be preparation of the so called Study of opportunities which will definitely check purposefulness of interconnection of individual parts of the CR and foreign countries by railway transport implemented on new railway lines with concrete, economically tenable technical parameters. The Study of opportunities will also reflect the factual condition of utilization efficiency of the existing conventional railway lines with respect to the need to reduce the load on its key segments (e.g. Prague – Pardubice).

In relation to tenability of parameters of new fast railway connections for concrete relations (obtained from the Study of opportunities) there will be subsequently - within the framework of part studies on feasibility with respect to individual transport arms - comprehensively compared also individual possible variants of routes (alternative possibilities of routing against tracks historically territorially protected) according to proposal parameters, including their detailed economic evaluation. For the purpose of obtainment of necessary supporting documents for these studies on feasibility, there was proceeded in 2013 to elaboration of territorial-technical studies which are to verify passability of alternative routes via the territory on connecting lines of fundamental directions.

The objective of the whole procedure of work described herein in a simplified way being creation of the concept explicitly determining individual elements of the infrastructure which future implementation will not be questioned, reassessed and will be able to be gradually - without further interventions - continuously prepared for implementation. Otherwise, it threatens that after the year 2020 there will not be available any sufficient portfolio of railway projects for the satisfaction of needs of users, and further development of railway transport will stagnate.

For evaluation of the significance of high speed lines in context of the rest of developing infrastructure an individual connecting line representing possible high speed lines (with a concrete achieved time of connection and concrete pricing rates) were introduced within the transport model in target state of transport infrastructure in 2050. In this target state such high speed lines take over part of demand for other transport modes and their infrastructure. Infrastructure is therefore dimensioned and evaluated in the model for this target state. The high speed lines „Dresden – Praha – Brno – Vienna/Bratislava“, „Praha – Plzeň – Munich“ a „Brno – Ostrava – Katowice“ were introduce into the model.

Results of described process will be one of the backgrounds for update of TSS2.

61.1.6 Projects of waterway transport with commencement of implementation by the year 2020

In the area of the infrastructure for waterway transport there were identified - from the viewpoint of fundamental transport needs of the state - the following three clusters of projects in the order according to their importance:

- Dolní Labe/Lower Elbe (Mělník – state border CZ/D) – securing navigability of Elbe for ships corresponding with navigation class Va for the maximum number of days in the year
- Dolní Vltava (Mělník – Třebenice) – securing sufficient underpass heights between Mělník and Praha, capacity of waterway in Prague
- Střední Labe/Middle Elbe (Mělník – Pardubice) – securing navigability of the Elbe between Mělník and Pardubice for ships corresponding with navigation class IV

Within the framework of these and other clusters there were also assessed projects of recreational navigation which, however, must be perceived especially in the context of support of tourism and activities attached to associated activities in the surrounding of the waterway. Benefit of projects of recreational navigation from the viewpoint of satisfaction of fundamental transport needs of the state was not proved. **Financing projects of recreational navigation will have to be secured primarily with the use of resources of IROP for support of tourism.** In the limited degree, there are also earmarked national resources within the scope of project packages.

In case of waterway transport, there stands more than in case of a road or railway network a premise that its full functionality is conditioned by implementation of all measures which are part of the concerned cluster (e.g. implementation of navigational level of Přelouč II has no importance without current implementation of the port of Pardubice and securing underpass heights of all bridges). It is also necessary to build related public port infrastructure. With the infrastructure for waterway transport there managed to be financially covered, in terms of the model, from available allocation the most important investment events which are part of the clusters Dolní Vltava and Střední Labe/Middle Elbe A condition for use of CEF sources will be approval of a concrete project application at the level of EC. For this reason, it is desirable that from the side of the investment department there be secured such a version of a project application that will have a high chance of being approved by EC. Therefore, it is recommended that applications for CEF resources contain the maximum (ideally all) of projects conditioning the functionality of the given clusters. In this respect, it is necessary to take into account, of course, risks of preparability and implementability of individual parts of clusters so that they comply with concrete conditions of calls.

Entirely crucial for the functioning system of water transport in the CR and for fulfilment of transport needs of the state being improvement of navigational conditions on the Dolní Labe/Lower Elbe in the section of Střekov - state border CZ/DE, building upon continual navigability of the Elbe in the territory of Germany. In this respect, there exists a *"Joint declaration of the intent of cooperation and transport objectives and measures on the Elbe waterway up to the navigational level of Geesthacht near Hamburg between the Federal Ministry of Transport, Building and Housing of the Federal Republic of Germany and the Ministry of Transport of the Czech Republic"*, concluded in 2006 at the governmental level. Even if this document has a recommending character, the German side accomplishes measures leading to the securing of agreed parameters of the Elbe waterway. Transport Policy of the CR 2014 – 2020 presupposes - in relation to this joint declaration - conclusion of a binding international treaty on the Elbe river between the CR and Federal Republic of Germany based on principles of economic partnership (see the Transport Policy of the CR 2014 – 2020, chapter 4.2.2).

The objective of improvement of navigability conditions in the section of Střekov - state border CZ/DE being achievement of navigable depth of 140 cm during 345 days in the year and 220 cm during 180 days in the year, and width of the fairway of 50 m. It concerns identical parameters of the waterway, as are minimally valid on the Elbe water-way in the territory of Germany. Objectives of improvement of navigational conditions on the lower Elbe may be achieved - according to prerequisites - with a set of technical and nature-friendly measures which exact specification cannot be defined in detail at the level of this strategic document.

According to depth and gradient proportions in this section of the Elbe river, it is further expected that the said set of measures will be localized only in sections where there are insufficient navigable depths and the river is not backwatered in a natural way. These sections are situated outside the territory of the system of NATURA 2000 and the territory of the NP České Švýcarsko /National Park/. Assessment of any influences on these protected areas is possible only in case of making the specification of the said measures more accurate, and therefore it falls within evaluation of influences of EIA (evaluation of concrete project plans).

Set of measures for improvement of navigability conditions of the Lower Elbe may be implemented only if economic feasibility is proved and upon termination of the EIA process and all related evaluations.

Within the framework of identification of projects in Book 6, there was submitted by the investor - for improvement of navigability of the Dolní Labe/Lower Elbe in this section - project V001 - Děčín Weir which - in evaluating the projects in the form of MCA - proved to be the most necessary project within the scope of the infrastructure of waterways. In relation to this project there is currently taking place a separate process of evaluation of EIA including also the above-mentioned set of other measures, including evaluation of possible cross-border impact. Thus, it concerns detailed assessment of possible influences and proposals for their elimination at a high level of a detail, which takes place outside this concept. **Need of improvement of navigational conditions on the Dolní Labe/Lower Elbe in the section of Střekov - state border is, however very important from the viewpoint of transport needs of the state**, especially with respect to capacity possibilities of the infrastructure of other transport modes in directions from the CR to important European seaports. Water transport may play here an important role.

Risks of the course of preparation of concrete measures in this section are, however, so high that there cannot be expected a possibility of timely submission of an application for financial resources within the scope of the national envelope of the cohesion part of the CEF fund. Financial coverage for improvement of navigational conditions in this section, however, must be secured at the moment of preparedness of concrete measures; therefore these financial resources are earmarked in the schedule of implementation. Commencement of implementation of concrete measures - improving navigational conditions in the given section - cannot be expected before the year 2017, therefore a part of the resources of the Cohesion Fund within OPD II and a part of the resources from national sources is preliminarily allocated for their implementation. In case of impossibility to implement - within an expected period - concrete measures, the financial resources will be reallocated to another measure. In case that the projects of the infrastructure of waterways are not capable of being financed from OPD II, it will be necessary to secure implementation of concrete measures from other sources. **A condition for the implementation of projects is always a necessity to prove their economic efficiency and obtainment of a consenting opinion of EIA.**

Projects of the infrastructure of waterways proposed for implementation from the CEF fund in the period of 2014-2020				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Securing navigability of Dolní Vltava from Mělník beyond Praha	8	2,190	2015 - 2018	Projects within the scope of cluster CV003P from Mělník beyond Praha (Securing underpass heights on the Vltava waterway, Increasing draughts on the Vltava waterway, Adaptation of gates chamber of Hořín, Modernization of roadsteads of the lock chamber Štvanice, Lock Chamber Praha - Staré Město, Adaptation of waterways Zbraslav and Štěchovice). There are expected applications for CEF resources (cohesion or European part) associating more concrete projects according to the state of preparedness and conditions of the call. The investor must submit applications in such a way that by implementation there is secured maximal functionality of the given cluster.
Making Elbe navigable to Pardubice	27	4,422	2015 - 2019	Projects within the cluster CV002P from Mělník to Pardubice (Level Přelouč II, Modernization of the lock chamber Srnojedy, Modernization of lock chambers Velký Osek, Brandýs nad Labem, Road bridge over Elbe between Valy and Mělice, Stabilization of shipway in the port of Chvaletice, Public port of Pardubice. Conditions of the application from CEF dtto as previous.

Projects of the infrastructure of waterways proposed for implementation from ODP II - Cohesion Fund and national sources in the period of 2014-2020				
Project name	**Band of evaluation of a cluster according to Book 8**	**Costs [mio CZK VAT exclusive]**	**Implementation expected from - to**	**Note, importance of projects, risks**
Improvement of navigation conditions on the Dolní Labe/Lower Elbe in the section of Střekov – state border	-	-	2017 - 2020	See the text above in 7.1.6. The objective of concrete measures must be to secure navigability for ships corresponding with navigation class IV for the maximum number of days in the year. Concrete measure will be assigned if economic feasibility is proved and in case of a consenting opinion of EIA enabling its implementation.

61.1.7 Infrastructure of the air transport

Entirely fundamental project in the area of the infrastructure of the air transport is construction of parallel runway at Václav Havel Airport in Prague. However, this project will be financed from own sources of the company Letiště Praha a.s., and therefore the financial schedule of Transport Strategies does not allow for it.

Another project necessary for the securing of continuous and safety operation of air transport being Replacement of System Data Processing under the charges of the state enterprise Řízení letového provozu /Air Navigation Services/. Renewal of these systems will be paid from financial resources of this state enterprise, and therefore the financial schedule of Transport Strategies does not allow for it.

On the basis of results of prepared feasibility study it will be decided on the form and mode of connection of Václav Havel Airport Prague to the railway network. Parts of the project will be implemented in this period. With the remaining parts of the project, there must take place continual investment preparation in such a way that the remaining parts of connection could be implemented in the following horizon.

61.2 Transport Strategy 2020 – 2035

Stage of the outlook proceeds from expected financial possibilities. Source financial framework is at the level of a prognosis of development according to the Proposal variant described in chapter 4.3. In the period of 2020 – 2035 there cannot be expected for the time being whether EU support for the implementation of infrastructure projects will be available, in what amount and by what conditions the use of such sources will be conditioned. Therefore, the proposal scenario - due to prediction of this fact - does not allow for the award of the EU resources for the implementation of concrete clusters.

However, there is an objective need - if there are to be fulfilled objectives addressed in the White Paper on the European Transport Policy, i.e. tripling the extent of FC/HST in EU by 2030 against the state in 2010 - that the projects of this type are supported from the European budget in this period. Any possible amount of EU support which will be very probably considerably lower than in case of the Cohesion Fund, a proportion of national sources will be increased which will be possible to be used for other parts of the infrastructure.

Procedure of the selection and evaluation of projects is similar as with the previous time horizon and still it proceeds from principles of the Construction of a strategy contained in chapter 6 of Book 10. Recommendation of development measures is carried out at the level of individual clusters and packages of measures in division according to the transport mode.

Schedule of the implementation of projects for the period of 2014 – 2023 **does not contain projects commenced in the period of 2021 – 2023**, for a possibility of commencement of their implementation must be specified according to the actual development of implementation of projects commenced in the period of 2014 - 2020 in the next update of Transport Strategies.

Horizon 2020 – 2035 will be further specified in individual updates of Transport Sector Strategies at the time there will be approaching the beginning of this period.

Strategic objectives of the proposal horizon:

- *Evaluation of the input state of the network (monitoring of implementation of objectives of the strategy of the previous period until 2020 - in terms of quality and quantity)*
- *Repairs and maintenance with high budget coverage are taking place, thus there are not implemented constructions of the type of optimization or upgrading instead of neglected maintenance*
- *Definition of the objective - "necessary" extent of the network at the end of the proposal horizon*
- *Earmarking of necessary resources for maintenance, repairs, and reconstructions which will lead to improvement of the state of the transport infrastructure network*
- *Completion of the TEN-T core network*
- *Construction of bypasses of smaller settlemens and implementation of other measures on class I roads - with which there will be a provable high benefit for the quality of life of a larger number of inhabitants and which will have acceptable evaluation of efficiency of investments*
- *Full completion of modernization of corridors in the first third of the period, including junctions, and securing sustainability of the modernized state*
- *Construction of VRT and fast connections if their defined version is economically efficient and concrete proposed fine-tuned measure (project) will be justified in the updated evaluation of the projects.*

In relation to road infrastructure the main task in the area of its development being completion of priority projects commenced in the previous period and implementation of other priority constructions from the group of the so called projects. Primarily it is necessary that there is prepared for this period - and at the beginning thereof commenced (unless it has been commenced earlier) - implementation of entirely fundamental measures:

- **Pražský okruh /Prague ring road/** at least in south-east part, ideally including the north-west part
- **R35** in the compact section between Ostrov and Mohelnice
- **D3** in the Central Bohemian region and border sections of R3
- Individual components of the TEN-T core network for road transport (R11, R49, R52)
- With constructions on **class I roads and expressways outside of TEN-T**, to implement primarily such measures which will follow up to the projects implemented in the past and will contribute to quality improvement of transport within functional units - clusters.

In relation to railway transport, the main task in the first third of the period of 2020 - 2035, i.e. by 2025, in the area of development of railway infrastructure being completion of priority projects commenced in the previous period and implementation of other priority constructions from the group of the so called projects, or suggestions fine-tuned until then to the level of projects. If commencement of key constructions is not carried out by the year 2020, it is necessary to implement these projects in this period. There is also expected - in relation to stipulation of the concept of VRT/RS - primarily implementation of a new railway line corresponding with this concept in the section Praha - Lovosice, for this part of VRT/RS is part of the TEN-T core network. There is not excluded even construction of new lines in the direction from the junction of Praha.

In relation to waterway transport there should be completed implementation of fundamental projects in this period with high importance for the national transport system. If such measures are not completed, it is necessary to implement them at the beginning of this period. Primary task is to secure implementation of the required parameters of navigability of the Dolní Labe/Lower Elbe (the Střekov – state border segment).

61.3 Transport Strategy 2035 – 2050

Stage of the outlook proceeds from expected financial possibilities. Order of clusters not planned in detail, there are stipulated strategic principles and according to the actual need and actual state of the infrastructure the framework plan will be specified well in advance before the beginning of the year 2035 from which this prospective horizon ending with the year 2050 is proposed. Basic task in development plans for this period will be completion of the TEN-T comprehensive network including VRT/RS lines if such development plans prove to be economically efficient (see 7.1.5). Proposed source **financial frame** according to the Proposal variant is clearly indicative for this period, for an amount of variables which will occur until then cannot be responsibly anticipated at this moment. The main criterion by which the source side of this period is influenced being an expectation of a faster reducing yield from an excise tax on fuels and oil with regard to expected greening of a vehicle fleet when there will be a fundamental task for the state to secure sufficient tax yield for the budget of the Ministry of Transport and the state budget in the form of taxation of also alternative fuels according to the current situation. A big unknown for such remote horizon is also development of prices and other macroeconomic prerequisites. This horizon will be - in the course of the following updates of Transport Strategies - most influenced and will be most modified according to economic development and on the basis of the monitoring of a strategy.

Strategic objectives of the proposal horizon:

- *Evaluation of the input state of the network until 2035 (monitoring of implementation of objectives of the strategy of the previous period - in terms of quality and quantity)*
- *Specification of the global objective of the strategy - compact and functional networks of transport infrastructure - completion of the TEN-T* comprehensive *network*
- *Outline of procedures and evaluation of impacts of an approach of value engineering (what is possible within the scope of the financial framework and what is to be excluded/postponed/limited if not everything is possible, or somebody wants something extra).*
- *Proposal of a measure for removal of duplicate measures and limitation of proposal parameters and extent of the network for fulfilment of the objective*
- *Substantiated proposal specifying needs of funding for achievement of objectives (increase of funds) for implementation of all necessary projects according to their list (Book 6)*

61.4 Requirements for further continuation and improvement of the quality of the Transport Strategies process

Transport Strategies will be topical for the period of the next approx. 5 years. There were created interactive working tools for acquiring other variants of development of financial sources and drawing up a schedule of implementation of measures via the Simulator of construction of projects. These working tools and experience with their application being the most important output of Transport Strategies. Already the work on Report Z.10.2 by which there was fully incorporated into this Book 10 a feedback of the Contracting Authority - preparation of the Proposal variant of funding and its utilization within the scope of adjustment of the final version of Transport Strategies being a very good example of use of a flexible planning tool for the incorporation of the feedback of the Contracting Authority into the Transport Strategies.

Another complete update of the Transport Strategies is desirable approximately at the interval of 5 years. However, a fundamental thing in this period being to work with the outputs of the Transport Strategies and to transfer them in a maximal extent into practice. At present, there is expected a partial update after termination of eligibility of expenditures within OPD I, i.e. in the first half of the year 2016, after that approximately in 2020 for the period after termination of OPD II, and then periodically after 5 years. The compliance with the principles and implementation of measures according to Transport Strategies will be evaluated annually in the text of the SFTI budget.

According to methods given in chapter 62.4 there will be periodically carried out an update of the transport model. Within the framework of works on updates of Transport Strategies there will be carried out an update of needs of transport infrastructure, update of financial sources and update of outputs of the strategy.

Basic precondition of successful use of Transport Strategies being introduction of institutional changes according to chapter 62.1,, when the Section of Transport Analyses established under the Strategy Department of the Ministry of Transport will strictly pay attention to that the preparation of project and preparatory documentation of constructions takes place in accordance with Transport Strategies with a sufficient reserve of substitute projects. There will be always necessary to take into account the fact that constructions will not be possible to be prepared for construction within necessary dates for various reasons, therefore there must be prepared other necessary constructions and it will be necessary to modify the procedure of implementation operatively. It is not further possible that constructions are not prepared in a situation when budget resources have been obtained and it is also undesirable that there takes place any preparation of projects which are necessary very little, economically inefficient or duplicate with respect to other solutions of the same problem. Use of unique EU sources for constructions which did not show sufficient priority within the scope of evaluation in Transport Strategies is considered as entirely unacceptable. Therefore the maximum effort must be exerted with the aim to move forward preparation of measures solving the key needs that were identified as the most pressing under Transport Strategies. In the case of specific measures that have been prepared over a long period of time, preparation stagnated in the past period due to process reasons.

Outputs of Transport Strategies also contain a clearly indicated risk that the construction may be discussable with difficulty due to environmental influences during construction and especially during operation. Preparation of such constructions must be paid special attention, it is necessary to prepare all requisite studies and assessment of influences on the environment and health of inhabitants, and to prepared very quality Documentation on assessment of the influence of the construction on the environment (if possible in variants). In these cases it is not only an obstacle which must be overcome, but a tool for dealing with fundamental conflicts with interests of protection and with inhabitants who are afraid of the worsening of the environment in their homes, but it must also deal with the positive benefits to minimization of the existing health risks.

Many measures are defined in the Transport Strategies as a suggestion. About such future constructions there is not available enough information so that it is possible to responsibly decide on commencement of their implementation. Transport Strategies recommended commencement of preparation of the construction in cases when from available information - by use of created methods - there was ascertained probable necessity of implementation of such a measure. A case when there is not enough information for an explicit decision - being all measures related to the construction of fast railway connections. Transport Strategies are an appropriate tool for assessment of individual compact sections of RS and as soon as there have been prepared sufficiently detailed supporting documents about the running of the route, costs and influences on the environment, it will be possible to assess the individual constructions. Another problem is the securing of the financing of such very costly constructions. From the used procedures it follows for the time being that with respect to constructions relating to modernization and development of the railway infrastructure it is possible either to implement a small number of highly costly constructions, and basically to stop the process of modernization of the network above the scope of procurement of operability, or to implement modernization constructions, but not to prepare very costly constructions. For them there would have to be procured other funds, or there would have to occur stoppage of the programme of construction of motorways, expressways, and more costly relocations of class I roads, which is entirely unacceptable with regard to indicated needs of the network and of the state. The only solution being to obtain other sources of financing above the scope of the Proposal variant of funding with special-purpose tying with respect to the implementation of such concrete development measures. With respect to an expectation of commencement of the construction of an important part of fast connections after the year 2020, it is desirable that the Czech Republic - in the course of the next program period - negotiated with the European Union a possibility to secure the co-funding of constructions which have basically a transnational importance, i.e. constructions of fast connections, within the scope of the next program period of EU 2021 – 2027, or 2028 – 2034. In such periods, fast railways may be the only acceptable investment from the EU sources together with municipal rail systems in cooperation with surrounding central European countries which are not mostly able to implement a new network of fast railways with their own efforts.

During their next upgrades, the following will be appropriate to be carried out with respect to the prepared Books, especially:

<u>Book 1</u>: to supplement in the evaluated document the requirements for the current or future needs of necessary statistics information for further development of prognostic works and of the transport model

<u>Book 2:</u> for the next period it will be appropriate to review division of commodity groups for the demand model

<u>Book 3:</u> to supplement recommendations for further development of discussion of professionals with respect to the update of TSS2, including inclusion of other entities

<u>Book 6:</u> to supplement proposals for information and technical securing of cards of projects so that it is possible to introduce them from the next version of TSS2, and to clarify whether the projects and plans relating to development of private railways, etc., are the subject-matter of TSS2, or not

<u>Book 7:</u> to verify the procedure of approval of the amendment to the Act on communications over land, constituting a framework to the "New concept of a motorway network" so that the text of TSS2 is consistent therewith

<u>Book 8:</u> to use - for the next periods - other criteria from the processes of SEA, EIA, zoning permission and building permit procedures and to add in the evaluated document requirements for extension of information provided - /by/to/ RIA - so that for the next period there is achieved information compatibility between annexed tables of the railway and road infrastructure.

61.5 Methodological notes

As part of the project, there were proposed financial allocations for maintenance, reconstructions and for packages of measures securing the equipping of the transport infrastructure. Unless otherwise stipulated, it concerns data at the price level of 2012 exclusive of VAT. Difference in stating costs incl./exclusive of VAT is given primarily by the fact that RMD is - as an institution receiving contributions from the State Budget in the extent of its main activity - a VAT non-payer, therefore it pays all its costs to suppliers inclusive of VAT and at the same time it is not entitled to any VAT refund. To the contrary, RIA is - as a state organization in the extent of its main activity - a VAT payer, thus it pays all its costs inclusive of VAT, but it is entitled to a VAT refund.

With roads, there was carried out a capacity analysis of variants and there were evaluated other variants - both prepared by the investor, and proposed by the consultan, citizens' associations or that have arisen from the capacity analysis. In many cases, there occurred more than two variants. There was always proposed for implementation the best evaluated variant, others were excluded from further evaluation. In many cases there was recommended a capacity-limited variant (in accordance with recommendations from Report Z.7.2 it is necessary to verify - within the framework of subsequent detailed assessment the individual routes - in detail separately).

In some cases, the capacity-limited solution is evidently less harmful to the environment than the proposed alternative construction (e.g. R35 Úlibice – Ohrazenice was recommended for solution as a modern class I road). In other cases there was identified a conflict between the economic efficiency and traffic-society need without finding an adequately appropriate traffic and economic solution.

A very important output of the Strategy being information about the need to commence implementation of the construction at a certain time, while valid dates are not proposed in such a way that it could be possible to effectively implement the whole cluster of constructions. On the basis of such cases, the investor will be imposed a task to prepare designated constructions within the given time limit. Investors must secure consideration and approval of the project **in time** so that there are always implemented compact routes, on the railways there are not missing reconstructed junctions and bottleneck, and on roads there are preferentially dealt with traffic-problematic localities.

62 Supporting and additional activities

The objective of this chapter is a proposal of an institutional adjustment for efficient application of strategic manager principles in relation to the project "MFDI" (Transport Infrastructure Financing Model)[27] which has been drawn up.

62.1 Institutional analysis

62.1.1 Institutional arrangements in relation to Transport Sector Strategies

In Book 5, but also in other parts of the output of Transport Sector Strategies, it is repeatedly emphasized that the Transport Strategies should be regarded as open, flexible document that will be continuously monitored and updated regularly.

The proposed system of monitoring is subject to subsections 6.2. It should be emphasized that the proposed system must be in accordance with the management processes and system. In order to optimize these processes, it is necessary to define the position, power, and the responsibility of individual subjects in the management system.

This section focuses on the institutional arrangements ensuring these processes and managerial activities related to the fulfilment of the principles of the transport policy and Transport Strategies.

The proposed modifications in principle emerge from:

- From the preferred "MFDI" model, but they are adaptable even for the case of selection of other variant
- From the Ministry of Transport Directive No. V-1/2012 on schedule of global construction preparation costs
- From the Ministry of Transport Directive No. V-2/2012 regulating the procedures of the MoT, investor organizations and SFTI during the preparation and pursuing of investment and non-investment executions on TI, financed without the share from the state budget

The main tenet of modifications is establishment of some institute responsible for enforcement of the principles of the strategy with the basic tasks:

- monitoring (surveillance and evaluation of indicators),
- updating the Transport Strategies to the necessary extent (in relation to the available financial resources, development of transport demand and condition of the infrastructure)
- operating and updating the multimodal transport model
- preparation of data for the compilation of short-term investment plan and costs of operation and maintenance in particular years

[27] http://www.mdcr.cz/cs/Strategie/MFDI/

- expert assessment of the suitability and adequacy of individual projects and the state of their preparation - feasibility studies, investment plans

The whole process should be in gestion of the MoT in cooperation with the MoF. The proposed position of this managing subject is the Transport Analyses Unit of the Department of Strategy of the Ministry of Transport. The process also requires close cooperation with the sector´s investors.

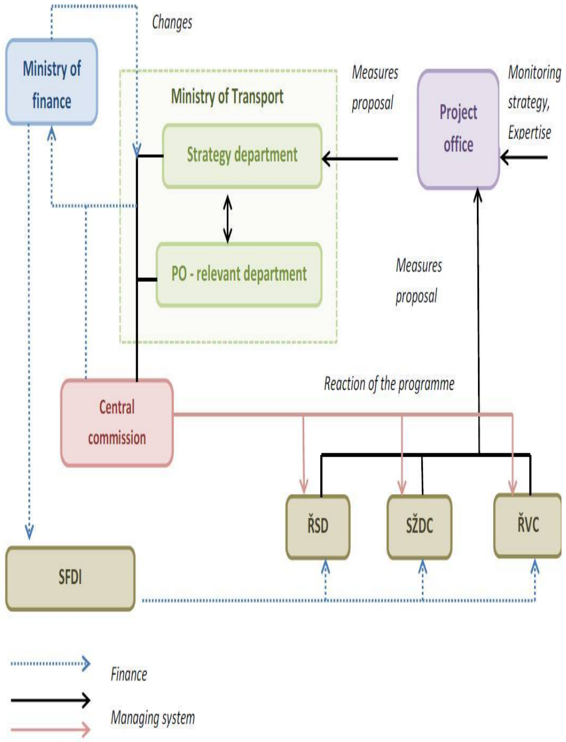

Figure 62.31 – Management Chart (according to the preferred model)

Additional TI funding resources that can support the stability of transport funding are considered PPP projects. These projects allow building and putting into operation the specific infrastructure in the short term. It also can spread the financial burden on the financing system into the years when the TI will be built and will generate revenue and socio-economic benefits.

Preparation, management and control process of PPP projects do not require additional institutional arrangements as compared to the chart shown above, but it will be necessary to create adequate environment for them in the public sector, namely:

- creation of a quality and stable inter-ministerial team - MoT and the MoF, particularly for the preparation of tender and contract documentation
- strengthening the institutions responsible for preparation and implementation of these projects, especially MoT and responsible institutional investor

- creation of a good support team consisting of legal, technical and financial advisors

62.1.2 Institucional changes of investors organisation strategy

Strategic planning takes place in different degrees and extent for individual investors. It is mainly coordination and planning activities which is really important in the preparatory phase of each project. Within work on the Transport Strategies document following general scheme for conceptual and strategic processes was formulated and it is reasonably valid for individual organizations, ensuring the preparation and construction:

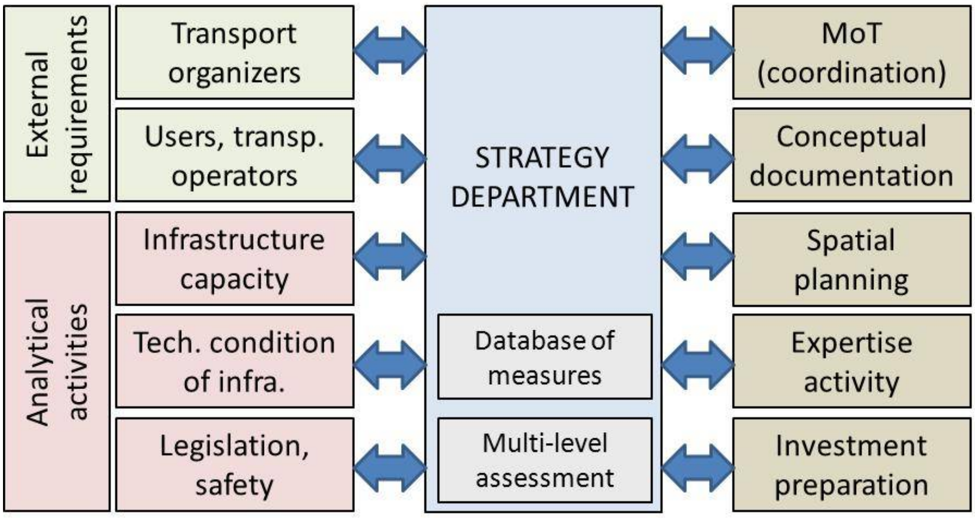

Figure 62.32 – Diagram of recommended actions within the investor strategy

62.2 SWOT analysis

The SWOT analysis focuses on the institutional changes proposed in Transport Strategies - the definition of the role of the Section of Transport Analyses. In principle, it emerges from the preferred “MFDI” model, but it is adaptable even for the case of selection of other variant.

Institutional changes	
Strengths	**Weeks**
• Transparent and flexible way of strategy monitoring • Bringing together expertise of upcoming projects with monitoring of strategy plans • Stabilization of information flows and the possibility of their effective control • Coordination between project database and input data model	• The demands on jobs and equipment of the Section of Transport Analyses • Unclear definition of the position and responsibilities in the case of ministries restructuring
Opportunities	**Threats**
• Independent management body establishment • Stabilization of the financial year and the possibility to combine them with the strategy intentions • Professional use of multimodal model • Strenghening of strategic role of the Ministry during the process of determination of the priority measures on transport infrastructure	• System failure due to limited powers and uncertainty of management of the Section of Transport Analyses • Small usage of the system, the political decision-making • Unprofessional political intervention to the decision-making process.

Table 62.100 – SWOT analysis of institutional changes

62.3 Monitoring of Transport Strategies

The system of monitoring and regular evaluation of the strategic plan prepared by TSS2 project should serve to investigation of:

⇒ the level of objective achievement when it comes to the objectives of the strategic plan, transport and other policy strategies by infrastructure projects
⇒ material and financial fulfilment of projects, packages and measures
⇒ effectiveness of specific projects, packages and measures in achieving the impacts and material fulfilment

For the process of evaluation of the fulfilment of the objectives of the strategy t is necessary to introduce a system of monitoring and evaluating of the fulfilment of the objectives of the Transport Sector Strategies, especially on the basis of a set of measurable indicators. Indicators should be used to control the set objectives, by which the achieved progress in the defined priority areas is monitored. This information is necessary for continues reassessment of the effectiveness of the strategic plan for the construction of TI in relation to the objectives of transport policy.

From the evaluation of the system of indicators are obtained materials for a possible revision of strategy and change of the way of its implementation.

The system of monitoring and evaluation of the plan for the development of TI (in accordance with Transport Sector Strategies) involves the following main steps:

- An establishment of a set of indicators of impacts (and outcomes) to be used for evaluation of impacts (outcomes) generated by a strategy which will be used to evaluate the influence of a strategy on the efficiency of the whole system. In the case of these indicators a strategy only creates conditions for their fulfilment, but it must be stated that the results of the indicators will be concurrently influenced by external factors which cannot be influenced by the strategy itself. The initial and target state will be set for each indicator (the initial state for 2013, the target state for 2020). An expected development is specified for an impact (outcome) indicator.

- Determination of a set of indicators of outcomes to monitor implementation of the Strategy that will focus on the fulfilling of implementation of individual packages, as of 2015 and 2020.

The financing of the implementation of the Transport Sector Strategies is running either through the resources of the MoT, or its subordinate organizations respectively, or from the SFTI budget.

The chosen indicators must have explanatory capabilities reflecting the specific objectives of the Transport Strategies.

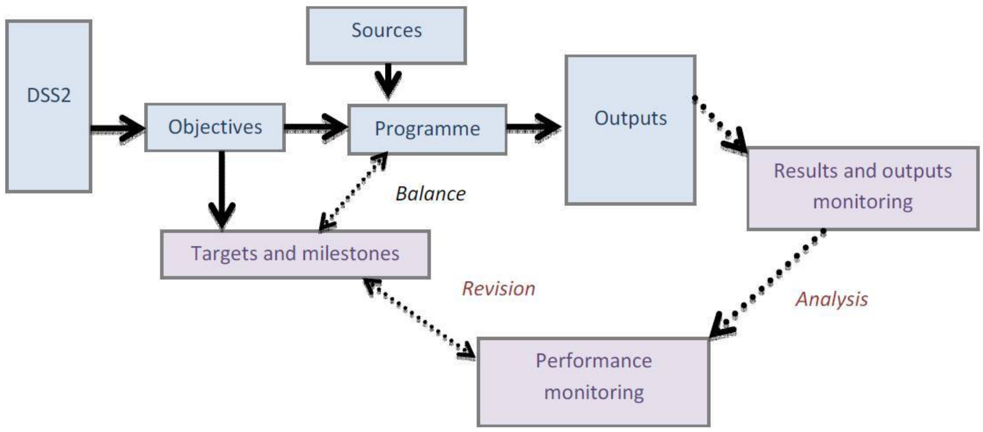

Figure 62.33 – Monitoring of the process of development of Transport Sector Strategies

The selection of indicators was proposed in a way to provide information on meeting the objectives of the Transport Strategies. Therefore, relevant indicators have been selected to monitor important results that show the true achievement of the visions and objectives. Targets values and development plans for each of the indicators have been defined in a way to quantify the expected annual change of the observed indicator.

Monitoring programs generally focus on three core areas - outputs, outcomes (and impacts) and external influences:

- **Outputs:** Those are represented by adopted measures or expended resources (e.g. funds).
- **Impacts (and Outcomes):** Those are represented by effects of the adopted measures representing progress towards the key objectives of the strategy. They may include transport behaviour, public attitudes, levels of transport activity and measuring of congestion, emission and air quality. Those effects are at the same time influenced by external effects that represent hanges in circumstances that affect the achievement of the objectives. The examples could be economic growth, use of land, general trends in behaviour of passengers, socio-demographic changes, legislation, etc.

The correct setting of the set of indicators which are suitable for monitoring requires the need to respect the following principles:

- **Balance:** The set must reflect the main objectives of the strategy in a balanced way.
- **Availability, predictability and measurability:** Feasibility of model estimation and acquisition of quality data are important. We assume that some of the result indicators will be estimated by the traffic model.
- **Assessment of the effect of the strategy itself**: Indicators and indicator measuring methods should express impacts of the strategy, not of more simultaneously ongoing influences.
- **Clarity:** Indicators should be simple and unambiguous.

- **Acceptability:** With regard to the need for acceptance by those who will apply them.
- **Limiting the number of indicators:** Focus on core objectives without duplication and unnecessary indicators.
- **Comparability:** It is important to adopt the definitions / methods that are feasible and consistent across measures.

62.3.1 Indicators of impacts

The impacts of infrastructure that meet the objectives of TSS2" and the objectives of transport policies include:

- time savings
- an increase in volume of personal rail / guideway transport
- an increase in volume of freight rail / combined / waterway transport
- a reduction in road accidents count
- excessive noise presence

The effectiveness of specific measures in achieving the specific objectives is monitored by the ratio of impact of the measure to the cost of measures. The following table lists the identified impact indicators.

Indicator	Unit	Expected development	Estimate for 2020	Measurement method / Description
Development of the accident count in road transport	The number of killed persons within 30 days after an accident/year	Decrease	max. 360 persons/year	Evaluation before and after (statistics of the accident count)
Percentage of inhabitants exposed ro excessive noise	In %	Decrease	Decrease by 15 % (between 2020 and 2012)	Local measuring, calculation of the percentage before and after
Transport outputs of the public passenger transport	Millions of passkm/year	Increase	28,000 (the initial value is 27,581.1 in 2011)	Sector statistics
Percentage of the transport volume in the railway and water freight transport for carriages exceeding 300 km	Percentage of the total volume	Increase	Increase from 41 % (2011) to 50 % (2020)	Sector statistics
Transport output of combined transport	Tonkm/year	Increase	From 2,233,406 in 2011 to 2,450,000 in 2020	Statistics of sales and cost surveys

Table 62.101 – Indicators of impacts and outcomes

62.3.2 Indicators of Outputs

TSS2 proposes an optimal allocation of resources between packages and individual measures. This allocation represents a particular physical implementation or output. The fulfilment of these objectives is needed to be monitored continuously under the terms of achievement of the following output indicators.

The effectiveness of the outputs (however, the contribution of the impacts is also monitored) is monitored globally under the terms of unit costs of constructions (efficiency of project tendering) as well as the coverage of demand (specific potential impacts and benefits for passengers and carriers / hauliers).

While monitoring the infrastructure outputs, it is necessary to continuously monitor whether the actual course of short-term plans, preparation and implementation of major road and rail projects, which have been the subject of MCA, at least approximately follows the "schedule" of TSS2 contained in the previous chapters of the present Book 10.

Indicators	Package	Units	Value in 2020
Development of motorways, expressways and Ist class roads	A1		
• new sections of motorways	A1	km 2014 - 2020	90
• new sections of expressways	A1	km 2014 - 2020	65
• modernization of I.st class roads	A1	km 2014 - 2020	30
• expansion of capacity and modernization of motorways and expressways	A1	km 2014 - 2020	100
• bypasses and relocated tracks of Ist class roads	A1	Number of km 2014 - 2020	120
Development of railway infrastructure	A2		
• modernization/optimization of the existing lines	A2	km 2014 - 2020	360
• electrification of lines	A2	km 2014 - 2020	35
• modernization of railway junctions and stations	A2	Number in 2014 - 2020	14
• Revitalization of regional lines	A2	km 2014 - 2020	200
Development of waterway infrastructure	A3		
• projects of making the Elbe water way navigable	A3.	Number of constructions 2014 - 2020	2
Development of freight transport terminals	A5	Number of public terminals of multimodal freight carriages meeting the AGTC parameters connected to regular services of multimodal intercontinental transport in 2020	5
The number of kilometres of the road and motorway network equipped with dynamic operation control	B1	km in 2020	150
Electronic tolling system	B1	Number of chargeable km in	7000

		2020	
Securing of interoperability - GSMR	B3	km 2014 - 2020	1400
Securing of interoperability - ETCS	B3	km 2014 - 2020	1000
Implementation of remote control of signalling plant	B3	km 2014 - 2020	700
Support to development of public transport infrastructure – city rail systems (trams, metro)	D	Number of projects in 2014 - 2020	5

Table 62.102 – Indicators of outputs

62.3.3 Framework of monitoring

An effective monitoring must be based on a simple and effective (and adequately funded) monitoring of development of key indicators. At the same time, an effective feedback system should be set up. In the process of implementation of the plan, it is important to maintain a balance between the objectives and planned investments, particularly with regard to the financial capacity of investors. This balance may be subsequently adjusted in each iteration step of the development of the final plan.

Monitoring of implementation of the strategy takes place in three areas:

Indicator	Description	Measurement
Financial	• Total financial amount of the plan • Volume of the plan according packages/ modes	% of plan
Volume (technical)	• Overall fulfillment of the plan (content) • Volume of the plan according packages/ modes	% of plan
Technical	• Evaluation of the network compared to baseline conditions for individual modes and type of action	Evaluation of the status according to the criteria

Table 62.103 – Indicators of strategy monitoring

The figure below shows the framework for monitoring of the strategies as well as the process of assessment of performance with respect to the individual indicators. This process helps to adopt corrective actions or to modify the individual objectives. In further stages of development, it would be appropriate to work up methodology of indicators of delay of constructions against the plan and cost increase of constructions against the plan.

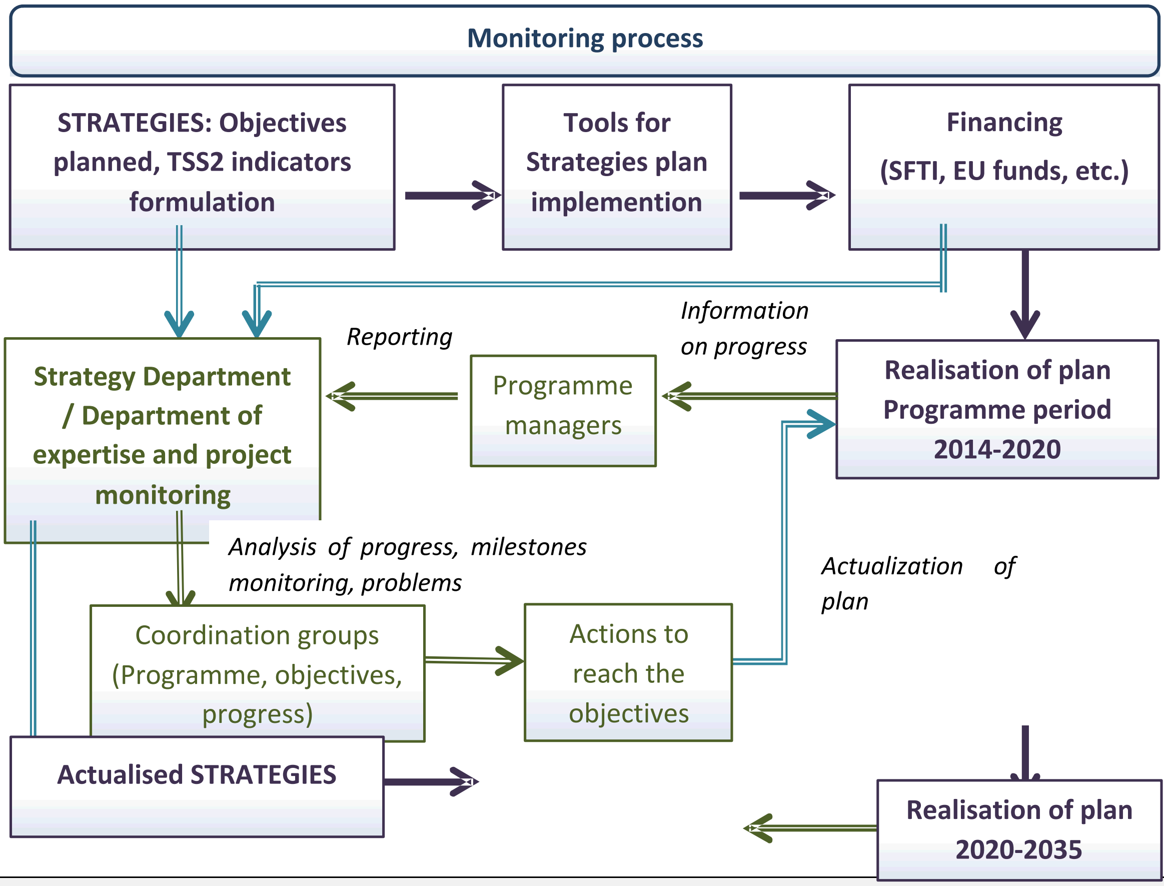

Figure 62.34 Diagram of the process of monitoring

General principles of monitoring:

1. It is necessary to systematically monitor the indicators.
2. It is necessary to annually prepare and update the current plans for the development and management of the infrastructure based on the principles and content of the long-term strategies, combined with more practical factors such as projects readiness, etc. The annual plan should address the construction and development activity.
3. It is necessary to annually evaluate the implementation of the strategic plan and propose measures in new short-term plan for rectification of deviations from the strategic plan.
4. In the middle of the planning period, it is necessary to make tactical review of the strategic plan depending on its effective implementation and validity of its initial assumptions. Based on the conclusion prepare/not to prepare update of a whole plan.
5. Responsibility for implementing and monitoring of the plan, including the responsibility for collecting of relevant data.

Specific recommendations:

1. Monitoring and data collection for strategic (and short term) planning should be the responsibility of the MoT (or its planning units) in collaboration with executive sections (RMD, RIA , SFTI)
2. Preparation of short-term infrastructure plans should be in the competence of the executive sections under the supervision and approval of the MoT (or its planning unit) - preparation of the SFTI budget including budgetary measures hearing is to be in maximum degree in line with the principle of Transport Strategies
3. MoT will provide ongoing data collection on traffic and transport relations for planning and monitoring purposes (except the activities of operators) in cooperation with the RIA.
4. To use data from the sector statistical ascertainment of MoT and possibly other outputs from the ascertainment of ČSÚ and other departments within the scope of the State statistics service. In case of necessity, to secure extension of collection of data within the sector statistical ascertainment of MoT.

62.4 Update of the transport model

Within the project there was created a strategic multimodal model of the CR for passenger and freight transport. Transport model was used as one of the tools for preparation and evaluation of analyses carried out within the scope of Transport Sector Strategies. Within the framework of the monitoring of fulfilment of Transport Sector Strategies, however, it will be necessary to operate and update own transport model as well. This topic may be divided into the following units:

62.4.1 Operation of the model

It concerns own technical securing of the work with the model, a possibility to prepare analyses and carry out own updates of the model. Methodology of preparation of the model of the initial state was described in Book 2, methodology of preparation of the model of prognoses was described in Book 4. In Book 4 there are further described input and output data of the model - file structure necessary for calculations of the model and software of the model.

Basic type of calculations of the transport model is calculation of the traffic load. This calculation may be carried out as the so called "small", that resources that there is carried out only a calculation of the load (4th step of the transport model, finding the route) for the analyzed mode. Further, there may be carried out the so called "big" calculation when all steps of the calculation including induced and transferred transport take place. Calculation procedures for small and big calculation are already set in submitted versions of the model described in book 4. Duration of own small calculation is approximately 2 minutes on a powerful personal computer. Duration of the big calculation is approximately 10 minutes for the model of freight transport and approximately 60 minutes for the model of passenger transport.

Even if calculations are predefined in the model, they are basically very complex and omission of one calculation procedure may lead to erroneous results. For work with the model there is necessary extensive experience with multimodal transport modelling and traffic-modelling software similar to used software VISUM. It is necessary to fully understand individual sequences of calculations and their carrying out by the software. Without such knowledge, it is not possible to operate the model, i.e. to insert data, to carry out calculations and to correctly interpret its results, or to further adjust procedures and adapt them to new knowledge.

Own operation of the model may be carried out in the following way:

1. Group of workers of the owner MoT securing continuous administration and update of the model. According to hitherto experience with administration of similar models, 2-3 persons with practice in traffic-planning sector should be enough. A possible advantage of this solution is a possibility to have a very often updated model at the disposal. A disadvantage is possible financial demandingness of this solution and at the beginning probably lower quality of processing. Worker will have to get acquainted in detail with the modelling software where full understanding of all functions and their application into the model may last several years.

2. Continuous administration and update of the model is secured by one external entity according to instructions of MoT on the basis of a time-limited contract. An advantage is lower financial demandingness than in variant 1 and continuity of processing. A disadvantage may be higher time consumption with respect to processing possible demand of MoT than with variant 1.

3. Update of the model is awarded to external entities. Possible advantage of this solution is lower financial demandingness. Possible disadvantage being less frequent update of the model, possibility of a different quality of processing in case of awarding updates to various entities even in spite of strictly defined requirements for update, and unclear administration of individual versions of the model.

Decision on operation and administration of the model is left with the contracting authority with regard to preparedness for administration, expected intensity of use and financial possibilities.

62.4.2 Update generally

Transport model is prepared on the basis of modern procedures and available sources. In future, however, there may arise a need to update both the procedures used, and entry data and parameters of the model.

Fundamental recommendation is to propose and implement a survey of traffic behaviour for derivation of parameters of a demand model which is missing for the time being in the CR in a sufficiently robust version. Survey should be sufficiently extensive and in terms of structure compatible with the transport model. Key outputs should be mobility of individual socioeconomic groups, progress of the number of travels with regard to distance and time of travel and parameters for calculation of the modal split.

From the viewpoint of calibration data, it would be appropriate - with individual and public transport - to ensure homogeneous and updated database of counting traffic volumes in all above-mentioned transport systems due to easy future update of the model. It would be also appropriate to extend statistics finding of OD relations procured by MoT for freight transport to passenger transport, best at units of SO ORP.

With freight transport, it would be appropriate - as well as with passenger transport - to ensure a series of surveys. Particularly, it concerns calibration of parameters for calculation of the modal split of which the price of commodities and sensitivity of these commodities to reloading and delay of delivery have the most important role. Further, it would be appropriate to follow more detailed information about traffic volumes even in combined, water and air freight transport.

While it concerns a transport model, inputs for its construction include much larger field of information than clearly transport. In the next update and administration of the model it would be appropriate to contact or inform organizations from other sectors than the transport sector, e.g. ČSÚ, MMR, MF, MPO, etc.

It would be quite appropriate to also contact the consultant and owners of strategic transport models of surrounding states and to keep mutually informed about methodology and results of transport models, especially, with regard to cross-border transport relations and evaluated plans. Similar relation should be established toward the European strategic model TRANS-TOOLS.

In the remote future it is possible to update the transport model with regard to an actual level of knowledge, e.g. to replace a sequential demand model with a simultaneous one, or to interconnect the transport model with the model of development of the territory (the so called land use models). Further, it is possible to supplement the model with other models, especially with respect to environmental analyses (noise, emission).

62.4.3 Model of the initial state

Model of the initial state is prepared for the year 2010. Input data serving for calculation of a traffic demand and description of a transport supply relate to this year. Update of the model of the initial state must be carried out at least once in five years. However, it is appropriate to generally carry out the update when new data are available providing an important piece of information about a traffic demand, or changes in the transport supply.

From the viewpoint of a traffic demand, it concerns, particularly, dates of evaluation of ten-year SLDB, particularly items: commute to work and to schools. Further, in case of acquisition of a sufficiently robust survey of traffic behaviour, to carry out application of its results into the transport model. Another reason for new calibration of the model being CSD (national counting of traffic) acquired by

RMD at a five-year interval. At a similar interval, it would be appropriate to again calibrate the model for the counting of traffic volumes in the railway transport.

From the viewpoint of a transport supply, it is appropriate to update the model when an important traffic structure has been completed (e.g. railway corridor or motorway), or if there occurs a considerable change in the concept of the running of lines of public transport and frequency of connections. Another reason may be implementation of a significant terminal of intermodal transport.

62.4.4 Model of prognoses

Update of the model of prognoses is appropriate at least at a five-year interval as well. It concerns retrospective monitoring of the progress of input parameters of the model (GDP, price of transport, level of automobilization, etc.) and their conformity with the reality occurred. In case of considerable deviations - with which there is an expectation that it does not concern a short-term deviation from the trend - there is necessary an update of the model of prognoses on the basis of newly stipulated prediction of input parameters. Further, there may be specified elasticity by explanatory and explained variables on the basis of retrospective monitoring of development of transport and transport statistics.

62.4.5 Institutional cooperation

In updating the transport model, there is necessary cooperation of several institutions. A middleman and organizer of this cooperation should be MoT as the owner of the model, or an external administrator of the model with authorization from MoT.

It is necessary to mention that procuring data for the transport model is a relatively difficult process. Reasons being, particularly, low knowledge of the purpose and meaning of the transport modelling, and thereby provision of required data. Oftentimes, there are also requested data sensitive so it is necessary to treat the provision thereof and further use best by an agreement of confidentiality. Therefore, it is appropriate to acquaint - at a bilateral negotiation with the relevant institution - its workers with the purpose of the transport model and with particular use of the data provided. Further, it is appropriate to appoint a contact person in the relevant institution, in case of MoT also among individual departments, responsible for provision of data in the agreed structure. It is appropriate to commence communication with the hereinafter mentioned institutions well in advance before own works on the update of the transport model.

62.4.6 Recommendation

Fundamental recommendation being to select - within a short period - a mode of operation of the transport model and to commence contact with institutions from which data for the update of the transport model will be required.

Further, it is recommended to propose and implement a survey of traffic behaviour for derivation of parameters of a demand model which is missing for the time being in the CR in a sufficiently robust version. Survey should be sufficiently extensive and in terms of structure compatible with the transport model. Last but not least, there should be also implemented other recommended surveys.

Update of the transport model is proposed in the following schema:

- Each year a part update of the model of the initial state reflecting development of the transport network, significant changes in the transport supply and in general features also results of transport and transport statistics of MoT.
- Once in five years a big update of the model of the initial state and the model of prognoses tied to the counting of traffic, statistics of inhabitants, including framework control of compatibility with models of surrounding states and the European model.

Apart from this schedule, there may occur updates of the model tied e.g. to new surveys of traffic behaviour or integration of new models and interface into the transport model (e.g. land use models).

63 Risks of implementation of Transport Strategies

Transport Strategies represent a plan for the development of TI in several time horizons. However, in the following years, some events that represent risks for the implementation of the strategy objectives can occur.

***Risk** is the threat of origination of an incident that may have a negative effect on achievement of the objectives of Transport Strategies.*

Based on the following list of risk groups, it is necessary to identify the potential risks:

1. Legislative
2. Economic and financial
3. Transport
4. Quantitative
5. Qualitative

The evaluation of the significance of risk is based on assessment of the expected likelihood of individual risks and their impact on achieving of the objectives of the Transport Strategies.

	Low	Medium	High
Risk probability	A	B	C
Impact of risk	1	2	3

Table 63.104 – Likelihood and Impact of Implementation Risks

The following table lists risks identified in individual risk groups.

Risk	Indication	Risk level	Impacts	Proposed measures to reduce / eliminate the impact
Legislative				
Changes in relevant laws / regulations	Code of laws, Strategy monitoring	C3	System of financing, the need for adjustments related documents and way of governance	Acceptance of adequate structural changes
Institutional changes different from the strategy assumptions	Strategy monitoring	B2	Financial flows, decision-making competence	Adaptation of management constructions
Fundamental changes in standards	Overview of standards, strategy monitoring	B2	Preparation and implementation of project, time delays in preparation due to legislative reasons	Flexible and responsible preparation. Stable legal framework
Changes in public procurement	Legal measures, strategy monitoring	C1	Adjustments timetable, the need for structural adjustment	Acceptance of adequate structural changes
Economic and financial				
Different economic development than predicted - GDP, exchange rate EUR/CZK, fuel consumption	Statistic data	B2	Impacts on the available financial resources	Operative management according to the principles of the strategy, updating the strategy
Different structure of the economy	Statistic data	A2	Impacts on transport model	Updating the model and strategy
Changes in the location of economic activities	Statistic data, PÚR, ZÚR	A2	Changes in ÚPD and transport model	Updating transport model and strategy
Change rating ČR	Statistic data	B2	Change in the cost of debt financing, PPP, of available financial resources	Updating the strategy
Lack of financial resources for the implementation of strategy plans	Budget,strategy monitoring	C3	Changes in the realization of the strategy, timetable	Operative management according to the principles of the strategy, updating the strategy
Only a short-term, one-time major increase in the budget	Budget	B2	Impossibility to continue implementing the projects in the following years – conservation, delays in other projects	Transfer of unused funds, pre-financing of EU projects with the possibility of subsequent reimbursement
Changes of financing	Sstrategy monitoring	C1	Different composition of available resources	Operative management according to the principles of the strategy, updating the strategy
Growth of prices construction work and materials different from the predicted rate of inflation	Price data, offer, strategy monitoring	B3	Demands in funding maintenance and investment	Operative management according to the principles of the strategy, updating the strategy

Transport				
Change in the pattern of transport (modes)	Aggregation of volumes, strategy monitoring	B2	Changes to the model and access to strategy, financial resources	Updating the model and strategy
Changes in the composition of the traffic volume	Aggregation of volumes, strategy monitoring	B2	Changes to the model and access to strategy, financial resources	Updating the model and strategy
Change in the volume of freight transport	Statistic data, strategy monitoring	B2	Changes to the model and access to strategy, financial resources	Updating the model and strategy
Increase / decrease in passenger road transport on toll roads	Statistical data, strategy monitoring	B1	Financial resources	Updating the model and strategy
Increase / decrease in public transport	Statistic data, strategy monitoring	B2	Changes to the model and access to strategy	Updating the model and strategy
Increase / decrease IAT	Statistic data, monitoring strategy	C2	Changes to the model and access to strategy	Updating the model and strategy
Faster / slower fleet greening the fleet in the road transport than expected	Statistic data, strategy monitoring	C2	Impact on the financial resources available	Updating the strategy
Quantitative				
Requirements for the volume of work in the preparatory phase of the corresponding inadequate transport needs	Strategy monitoring	B3	Increasing costs, realization delays	Functioning expertise and external examination according to Directive V-2/2012, taking timely action
Failure to timetable preparation	Strategy monitoring	C2	Cost growth due to inflation, delay in the realization	Monitoring preparation (Section of Strategy according to Directive V-2/2012, taking timely action
The growth of construction work - lower physical performance	Statistical data, strategy monitoring	B3	Growth in construction and maintenance costs	Reallocation of resources, strategy update
Qualitative				
Degradation of railway tracks	Diagnostics, measurement, data RIA	B3	Serviceability changes	Adequate measures, reallocation of resources, strategy update
Degradation of road network	Diagnostics, measurement, data RMD	B3	Limitation of rateability roads	Adequate measures, reallocation of resources, strategy update
Neglecting maintenance	Data administrator, strategy monitoring	C3	Deterioration of individual elements of transport infrastructure	Adequate measures, reallocation of resources, strategy update
Low quality construction work	Data submitters, strategy monitoring	A3	Disorders completed constructions needed repairs	Quality of tender documentation and construction supervision

Table 63.105 – Transport strategies implementation risk

An assessment of the level of risk and whether of the set up or planned procedures and actions are sufficient and maintaining the risk below the established limits and requirements is as follows:

Probability

Impact	A	B	C
1	I.	II.	III.
2	II.	III.	IV.
3	III.	IV.	V

For following categories of level of risk:

I. No special action is required. However, this is not a 100% acceptance of the risk, therefore, it is necessary to point out any existing risk.
II. Appropriate action should be considered.
III. It is necessary to take appropriate action.
IV. It is necessary to reduce the degree of risk to an acceptable level.
V. It is required to immediately adopt measure that will reduce degree of risk to the acceptable level

Important inputs for monitoring and continuous control of risks are primarily (in addition to the list of risks) interim/annual reports on the solution, evaluation of indicators that provide continuous information on the consumption of time, the completion of activities, draw on budget and realized outputs etc.

It is necessary to approach any update of strategy or transport model either at a periodical interval (with the transport model, 5 years proposed), or if there occurs a more significant deviation - with which there will be confirmed that it does not concern a random deviation or an error in measuring - with the group of indicators with a high degree of risk. It is necessary to approach the very update with deliberation and to carefully examine deviations of monitored data, to create from them thematic groups to which an extent and form of possible update must be adapted.

64 Summary of the proposal of the strategy

From conclusions of Book 10 there follows the need for the Ministry of Transport of the CR to adopt the following strategy:

The general key objective of the Transport Strategies is the operation of an effective sustainable transport system which is – looking at the scope of the backbone transport infrastructure - based on a raster of superior transport routes defined in the Policy of territorial development of the CR 2008 and subsequently in detail in further follow-up ÚPD and which must be gradually built according to outputs of a prepared flexible planning tool of development of transport infrastructure within acceptable technical-economic parameters.

The transport system to which the Czech Republic will gradually approximate has an objective to improve the quality of life for citizens and business opportunities of economic entities. By targeted measures in the area of operation and maintenance of transport infrastructure and its development implemented in the environment with stabilized and sufficient financial sources, the hard core of the transport infrastructure with guaranteed quality will be created which will be gradually supplemented. Stabilized extent of maintenance and renewal and gradual upgrading and development will guarantee both the quality environment for life and business, and stable work load for the building industry.

For gradual achievement of the general key objective, several fundamental measures given within the scope of the Transport Policy of the CR for the period of 2014-2020 will be followed - within the framework of the strategy. Particularly, it concerns the securing of stable and predictable resources for the coverage of financial needs connected with repairs, maintenance, and construction of transport infrastructure, or in addition, legislative or organizational-operational steps.

The basis of Transport Strategies on the outside being to stabilize incomes for operation, maintenance, and development of state transport infrastructure, while it is understood that the financing of two kinds will be secured:

- Mandatory (maintenance + operation)
- Development

Inside the transport sector, it is necessary to secure correct division and effective use of the financial sources. Sufficient financial sources are necessary, particularly for the needs, i.e. coverage of operating costs and costs of maintenance of the transport infrastructure. Furthermore, the financial sources are necessary for the securing of targets of the Transport Strategies at the level of wishes of society, in particular of the following:

- To complete construction of motorways and expressways
- To adapt Class I roads to the needs of transport and protection of the environment

- To build up - in a reasonable extent - modern fast railway connections

Priority being put removal of delays on the network, elimination of negative influences on the environment and removal of deficits in maintenance, not on investments as such. Exaggerated and with difficulty achievable targets would lead to subsequent crises and permanent incompleteness of the system. Only investments which can be implemented relatively early and where positive effect will be shown with an acceptable lapse of time from the investment decision are worthwhile.

Investments which cannot be implemented within a foreseeable period will be included in the database of measures. It is important to make more efficient and to rationalize works on the preparation of constructions as this is an issue where results are currently troubling for all state investors. With regard to uncertainties in the process of preparation and financing of constructions, it is necessary to have available projects in the extent of at least 200 - 300% actual investment possibilities of the proposal time horizon. It is necessary to constantly keep this seedbed of meaningful projects alive and actual, it is necessary to have valid all documents, to react to changes of standards and changes in approaches, to periodically update feasibility studies, or to renew DÚR or DSP. Thus, a living part of the database of development events will be available.

It will be necessary to put on hold investment measures above necessary scope, and to keep information about projects as for why it was decided not to proceed. Conservation may be prolonged, projects may be moved after some time to the "seedbed" of measures or upon ascertainment of their inefficiency and uselessness they may be cancelled. These projects will be stored in the conservation part of the database of development events.

Process of preparation of measures and implementation of activities in operating maintenance, preparation and development of transport infrastructure must be monitored by the Strategy Department of the Ministry of Transport which will also be the controlling body. Particularly, it is important to secure basic functions of the owner of the infrastructure, i.e. control of maintenance and well considered decision-making about development. It will be also necessary to adopt conservative attitudes to operation of infrastructure and not to operate any more the unused infrastructure.

System of management of maintenance, renewal, removal of narrow and dangerous places and old ecological burdens will remain under the responsibility of individual administrators of communications with a controlling activity of the Ministry of Transport; the development activity of investors will be coordinated by the Strategy Department, responsibility for effective implementation of development measures and timely securing of elements for obtainment of EU resources will be further borne by national investors.

For fulfilment of the main tasks in operation, maintenance and development of transport infrastructure, especially the following needs are fundamental:

- To continuously deal with necessary adjustment of priorities with regard to limited financial sources, to use thereto results of Transport Strategies and their planning tools.

- On the superior network, to make sure about permanent availability of the given infrastructure in required quality. It particularly relates to securing of costs of operation, operability, repairs or maintenance.
- Priority must be given to securing sustainability of operation of the existing transport infrastructure with regard to mandatory costs of the network within the meaning of Book 7.
- For the securing of mandatory costs of the network and necessary development, it is necessary to secure financial resources at least at the level of the Proposal variant of funding. Development activities of transnational importance, e.g. FC/HST, will not be possible without participation of the cofinancing of the European Union continuing also after the year 2020. Therefore, it is necessary to negotiate about a future financial frame of such cofinancing already in the following period.
- Further development necessary due to prove long-term predicted needs of users will be always limited by available sources. Superior structure of transport networks in the territory of the CR will not be completed yet - with regard to its extent and financial needs - by the year 2030.
- To secure the Proposal variant of funding, primarily for the period of 2014 - 2020, there is necessary stabilization of the source side for sustainability of the existing network and ideally also for a relatively conservative amount of constructions enabling fulfilment of achievable targets.
- **Securing stable financial resources for maintenance and development of transport infrastructure is a key task of Transport Policy of the CR for the period of 2014 – 2020 with an outlook until 2050. It is necessary to secure the stabilization of incomes for financing transport infrastructure with respect to SFTI (**the share of national sources without EU co-financing) **at least in the amount of CZK 43 billion/year. If, however, international obligations are to be fulfilled and the task of the state to create conditions for undertaking business in the CR within the framework of increase of its competitiveness and securing competitiveness of all regions is to be met, it will be necessary to politically decide on the securing of incomes of SFTI at the total level of at least 1.8 % GDP/year, which at current prices represents approx. CZK 70 billion /year - Proposal variant of funding.**
- **So that objectives might be achieved and users' needs met, it is absolutely essential for the investment preparation to continue primarily as regards sections of the TEN-T network (road, railway and waterway) and important sections of class I roads, with focus on priority projects depending on the results of Transport Sector Strategies.**
- Proposal for the TEN-T Regulation stipulates two layers, the core network is to be completed by 2030 and the comprehensive network by 2050 - this requirement primarily determines priorities along with preparedness of

projects and tying and availability of individual sources. In the period of 2014 – 2020 it will be possible to complete only a part of the given network. For this reason the highest priorities for this period were defined - within the framework of Transport Sector Strategies. After 2020 it will be necessary to make use of available financial resources in such a way that the said infrastructure could be completed within parameters corresponding with the proposal for the TEN-T Regulation - in 2050 at the latest. It will be necessary to build only what is necessary within reasonable technical-economic parameters with priority for projects connected with TEN-T.

- Feasibility studies and project plans will be approved according to directives of the Ministry of Transport (V-1 and V-2/2012) or according to their principles. Missing parts of the given raster of transport infrastructure will be prepared in the way that their capacity corresponds with the expected loading and that from the viewpoint of economic return they are justifiable and feasible. This fact relates especially to proposal parameters that must be optimized from the viewpoint of the investment life cycle, ideally as soon as in the initial phases of project preparation. At the same time, project optimization must reflect completed approval processes to the maximum extent.
- To commence tender procedures only for constructions with precisely prepared tender documentation so that non-eligible expenditures of projects (not acknowledgeable extra works) are eliminated in maximum extent. For this purpose, it is necessary to secure sufficient quality and responsible building supervision and to also adapt business terms and conditions to such requirements. Alternatively, to try to make use - for awarding constructions in the following horizon - of the design & build principles (Yellow FIDIC).
- Limitedness of financial resources in the predicted amount of the Proposal variant of funding may be only temporary, project preparation and investment activity being usually only by 7% of costs of construction, therefore preparation must take place in a higher degree against stipulated prospective resources for implementation.
- For measures on TEN-T, it is necessary to stabilize - at the level of the Ministry of Transport and investors - technical-economic parameters according to directives and to secure financial coverage of preparation according to priorities of TSS2, priority projects must be comprehensively secured from the viewpoint of preparation. At the same time, it is necessary to support "transferring" of potential high priority suggestions among projects.
- For measures on Class I roads which mostly cannot be assessed according to the transport model, it is necessary to fine-tune, in relation to priorities

of evaluation of TSS2 and results of concrete local assessments, a detailed overview of necessity of projects within the content of the whole functionality of categorized system of Class I roads. Preparation of constructions must be focused on quality and extent of prepared events. Preparations must be secured to the extent of not more than 3 times larger against the prospective amount of available resources as financial sources for implementation are limited.

- Priorities of preparation and subsequent constructions of railways constructions on TEN-T and outside of TEN-T must be determined by evaluation within the scope of TSS2 and mainly they must follow priorities of orderers of public transport, or commercial operators of railway transport (passenger and freight), which within the framework of Transport Strategies is, of course, included already in the very evaluation of projects - however, further specification in concrete feasibility studies is necessary.
- From increased budgets for operability, to implement primarily adaptations of railway lines according to today´s technical state and their equipping with regard to requirements of orderers. To prefer sufficiently timely adaptations on lines where a long-term contract with a carrier on the basis of a bidding procedure is planned (competition among carriers) so that subsequent operation could take place without long-term traffic interruptions and within an optimized working concept.
- In preparation of plans of high-speed lines / fast connections, it is necessary to proceed according to individual administrative-legislative requirements. To prepare a study of opportunities, to determine a substantiated technical-economic solution with a necessity to secure provably achievable economic efficiency. Subsequently, to prepare studies on feasibility of individual transport arms, taking into account possibilities of implementability of individual stages and their benefits in time (possibilities of preparability / beneficial use of stages / financiability). Subsequently to carry out the "transformation" from the suggestion to the project. Only then, such concretized section of VRT/RS may be evaluated along with other projects within the scope of update of Transport Strategies. Subsequently, according to results of feasibility studies, to discuss differences in comparison with the determination of corridors in PÚR and in the territorial-planning documentation of all gradual levels (especially ZÚR, and other ÚPD). For sections of VRT/RS, to intensively negotiate maximum support from the EU funds also for the period after the year 2020, otherwise it will be difficult to secure the financing (only at the expense of many other priorities of transport networks) with the predicted amount of the financial frame in the Proposal variant of funding.

- In case of the railway network, it is necessary to find savings on the basis of the process of the restructuring of the network. It consists not only in construction and upgrading of important routes which are of a big society-wide importance, but also in reduction, or regionalization or privatization of those parts of the network for which it will not be possible to find economically justifiable utilization. This problem is related to quality improvement of transport planning, especially at a regional level, and must be dealt with in detail within the framework of a prepared Public Transport Conception.
- As regards operation of railway vehicles, it will be necessary to evaluate pluses and minuses and financial demands of possible unification of the railway electrification system on the whole territory of the CR, taking into account the power supply systems in the surrounding states.
- For waterway transport, improvement and stabilization of navigational conditions in the border section of the Elbe - while respecting a necessity of securing sufficient parameters of navigability on the German side - is crucial. There follows a necessity to secure navigability of the Vltava beyond Praha (underpass heights) and navigability to Pardubice.
- Potential of recreational navigation in relation to support of recreation and tourism could not have been fully evaluated in TSS2 due to selected methods. From the viewpoint of the transport sector, it is crucial to support the preparation and financing of primarily transport projects. A key source for waterway constructions must be CEF (cohesion and European).
- Transport Sector Strategies do not work with DOE project, however, territorial protection of the plan continues to be in place and steps according to respective governmental resolutions are implemented.
- To ensure transferability of principles TSS2 to short-term annual plans of funding - transferability to the SFTI budget for coverage of individual packages of measures and concrete projects.
- To gradually increase the role of direct imposition of a charge on users of the infrastructure. To carry out the policy on imposition of a charge as predictable in the long term; to adapt toll rates to the structure of a vehicle fleet, to adjust the fee for railway transport route in accordance with valid legal regulation in advance and for a longer period of time - its amount should be sufficient for full reimbursement of costs related to management of railway traffic.
- **To try to achieve extra sources against the Proposal variant, primarily for implementation of priorities according to TSS2 and primarily for implementation of compact clusters of constructions with gradual financing from previous years of contracted constructions of** RMD**.**

- Not to commence own transport constructions without a guarantee of their financial coverage in the following years according to budget outlooks.
- To ensure pre-financing of EU sources in the period of 2014 - 2020 from the sources of a state budget, sections of the Ministry of finance, with subsequent refund - preservation of the existing system
- To admit debt financing payable from own sources of the Ministry of Transport only in case that a sufficient degree of financial resources for the co-funding of EU funds is not available or there is not available in the future period a sufficient degree for the financing of entirely key constructions (the first ten priority projects). Another admissible variant being the use of debt financing payable from own sources of the transport sector for settlement of an unexpected short-term loss of incomes on the source side.
- To prefer the implementation of PPP projects in case of significant projects where the long-term economic advantageousness of this mode of securing will be proved. To select for successful implementation only projects with a good level of investment preparedness in the extent of sufficiently continuous and longer cluster of the infrastructure. It is appropriate to try to use the possibility of combination of the PPP model and EU sources. Implementation of this model is to be simplified in the period of 2014 - 2020 against the current state especially from the viewpoint of mutual time coordination.
- To ensure support for construction and equipping of multimodal public logistic centres for enabling the strengthening of the multimodal role, or combined transport. The Transport Sector Strategies are based on a multimodal approach. Without implementing equipment which is necessary for the use of railway and waterway transport, it will not be possible to secure efficient use of investments in such types of transport. Multimodal terminals with the relation to logistic processes must be defined as an integral part of transport infrastructure with public access (does not have to be directly in the ownership of the state). Also for this equipment there is defined the core and comprehensive TENT-T network and recommended source coverage in the period of 2014 - 2020.
- To support a private sector in the equipping of the infrastructure for alternative fuels and thus to support their faster putting into practice. Impact of measures proposed for implementation in the Transport Sector Strategies also depends on development of energy sources for traffic operation. Change of the energy mix in transport is necessary, for current sources have big impacts both on public health and the environment, and on a global change of the climate. Reduction of the influence of transport on public health and the environment being the same important target of

the Transport Policy as securing competitiveness of the Czech economy. The issue of energy is dealt with in detail in the State energy concept and it will be elaborated in detail in the Action plan of sustainable mobility.

- Considerable emphasis and earmarked financial resources is also devoted to ITS within the scope of Transport Sector Strategies. It concerns important measures which are not still evaluated with a required emphasis. This area is, however, crucial in many areas of traffic transport - they increase the use of the existing transport infrastructure, they secure international interoperability of the traffic, they increase its safety and efficiency.
- To ensure fulfilment of the obligation of interoperability of the railway networks primarily in the order according to importance of individual lines and international obligations of the CR (transit railway corridors, other important national lines with important international operation). With national and regional lines, to implement DOZ systems in case of a proven stable order of public transport or possibly commercial transport (passenger or freight).
- To use ITS more in the traffic management of road transport. To support further conceptual development of the National Transport Information Centre in Ostrava. To extend systems of linear management of transport and equipping of backbone infrastructure with information panels. To improve provision of information to drivers in real time on the basis of actual data from traffic.
- To ensure - well in advance - selection of a supplier of the electronic toll system and a provider of services with the operation of this system related to further trouble-free functioning of performance-related levying of charges for communications over land after the end of the year 2016 when the effect of the contract for services with the current general supplier and predominant part of the contract for delivery terminates. To admit extension of the toll system only in case of an acceptable expense-to-revenue ratio with respect to collection - Transport Policy in this respect admits maximum proportion between incomes and expenditures in the amount of 30%. Not to admit loss of value of investments in the existing System of an electronic toll that is fully functional and very effective for collection of the charge. For the purpose of determination of an economically effective extent of the levying of charges for the network and the mode of a technical solution, it would be desirable to consider such a form of a tender procedure that will enable to obtain feedback of the market before the final selection of a supplier (negotiated procedures where a notice is published, competitive dialogue).
- Within the framework of development of transport networks, it is necessary to also reasonably support regional and municipal projects, development of cycle paths, but also development of airports

- It will be necessary to elaborate strategy of securing operability and management of transport on transport networks in relation to the increase of resources for maintenance and renewal of transport infrastructure

Transport Strategies are submitted in this extent and concept to the government of the Czech Republic for the first time from creation thereof. In future, it is necessary to ensure not only their regular updates from the viewpoint of the content, but also to increase their functionality, starting with maintenance of the multimodal transport model. The strategy identified a great number of suggestions which are - for the time being - poor from the viewpoint of required information which must be known about individual projects in order to be able to compare them objectively. A number of suggestions has potentially a great importance and investors must provide additional information about the suggestions for future versions of Transport Strategies and thus to secure their transfer transformation into projects. A separate chapter in this respect is composed of projects of Fast connections on the railway infrastructure where the drafting of the Study of opportunities is crucial. A number of unclarities persists also in other segments of the railway network except for four transit corridors. On the basis of recommendations of Book 7 of the Transport Strategies, it will be necessary to also deal with - in detail - proposed parameters on a number of important routes of the backbone road network.

65 Annexes

Annex S1	Scheme of the horizontal and vertical interconnection and mutual influence upon individual follow – up documents to the Czech Transport policy in time
Annex T1	Implementation Schedule for Transport Sector Strategies in the Area of Road Infrastructure for 2014 - 2020(23)
Annex T2	Implementation Schedule for Transport Sector Strategies in the Area of Railway Infrastructure for 2014 - 2020(23)
Annex T3	Implementation Schedule for Transport Sector Strategies in the Area of Waterway Transport for 2014 - 2020(23)
Annex T4	Costs of Packages (mandatory, Investment and project cost for 2014 - 2020(23)
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Annex M2	Map of projects for the railway transport infrastructure segment for 2014 – 2020 (23), with an outlook until 2030
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Annex M4	Map projection of the MMA results - road infrastructure
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Annex M7	Map of the TEN-T network for the road infrastructure
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Annex M9	Map of the TEN-T network for the waterway transport infrastructure
Annex H1	Assessment results for road infrastructure clusters
Annex H2	Assessment results for railway transport infrastructure clusters
Annex H3	Assessment results for waterway transport infrastructure clusters