REPUBLIC OF SLOVENIA
MINISTRY OF INFRASTRUCTURE

Transport Development Strategy of the Republic of Slovenia Until 2030

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For successful transport development in Slovenia

The Government of the Republic of Slovenia adopted the Transport Development Strategy of the Republic of Slovenia (Strategy) in 2015. The deadline for the majority of measures in the Strategy is 2030. The Strategy also discusses certain urgent measures after that year, which are required for a comprehensive review of transport. In 2016, the Government and the National Assembly of the Republic of Slovenia adopted the Resolution on the National Programme for the Development of Transport of the Republic of Slovenia until 2030 (National Programme). These documents were the first documents in independent Slovenia to discuss transport, and were vital for the successful development of transport in the country.

The Strategy is the first document to deal with the transport system in a comprehensive manner, thus enabling greater synergies in achieving the objectives of transport and spatial policies of the state and of other policies, and greater control of the impact of transport on the environment and the economy.

A national transport model, which includes an analysis and calculation of future traffic flows, and social and environmental impacts, was developed for the needs of the Strategy. The document is the first of its type in the field of transport, and is supported by a comprehensive environmental impact assessment.

Based on traffic flow forecasts, traffic safety, environmental impacts and social acceptability, we determined future transport measures for all transport types, i.e. sea, air, rail and road transport, and for sustainable mobility. We determined 29 measures for rail transport, 37 measures for road transport, 22 measures for public passenger transport or sustainable mobility, 14 measures for waterborne transport (sea and inland waterways) and 6 measures for air transport, thus, a total of 108 measures governing infrastructure, organisation, traffic management, traffic safety and vehicle fleet.

As per the nature of the document, the Strategy is declarative, and the Government ordered the Ministry of Infrastructure to prepare the document for the implementation of the Strategy. To this end, the Ministry prepared the National Programme, which stipulates more detailed activities, implementation methods, requisite funds, deadlines, and entities responsible for implementing the measures referred to in the Strategy. The primary objective of the National Programme is to ensure stable funding for the field of transport without significant annual fluctuations, thus enabling the smooth realisation of key projects of national importance.

By realising the National Programme, we will provide our citizens and the Slovenian economy with suitable conditions in the field of transport, i.e. greater mobility and accessibility, more effective supply to the economy, greater traffic safety and protection, reduced energy consumption, lower costs to users and managers, and lesser environmental burdens.

The following are some key projects which will contribute to the aforementioned objectives: the construction of a second track between Koper and Divača, Ljubljana and Jesenice, and Maribor and Šentilj; the elimination of bottlenecks on the Ljubljana railway hub; extension of the Ljubljana motorway ring; the introduction of a uniform ticket and timetables for public passenger transport; promotion of the use of alternative fuel vehicles (electricity, gas, hydrogen); the rehabilitation of the national road network, including the development axes; the expansion of the capacity of the Port of Koper; the creation of conditions for expanding the activities of Slovenian airports in Ljubljana, Maribor and Portorož.

In conclusion, I would like to emphasise the positive effects of implementing the National Programme, which will be reflected in high-quality infrastructure, reduced negative environmental impacts, improved public passenger transport etc. The Programme will also have a positive impact on the economy, the building sector and thus related activities, and the growth of gross domestic product.

Slovenia thus has two important documents, the Transport Development Strategy of the Republic of Slovenia and the Resolution on the National Programme for the Development of Transport of the Republic of Slovenia. However, two new trends are already evolving in transport development – decarbonisation and digitalisation.

We wish to develop into a low-carbon society, to which we are bound by international commitments and the Paris Agreement. By 2050, emissions are to be reduced by 80 per cent compared to 1990. We must reduce the use of energy in transport, industry and households, and fossil energy sources will have to be replaced by renewable sources.

The role of digitalisation will become increasingly important in the future. It will enable the development of communication systems between transport infrastructure and vehicles and between vehicles in order to enable safer and more economical travel. The trend of digitalisation in transport is one of the most rapidly evolving and most promising fields, and playing an active role may be a significant opportunity for Slovenia.

Dr. Peter Gašperšič

Purpose

The purpose of the Transport Development Strategy in the Republic of Slovenia is:

- to present the standpoints, needs and possibilities for the development of the key transport fields in the Republic of Slovenia;
- to prepare a harmonised development programme for the key transport fields in the Republic of Slovenia;
- to ensure ex-ante conditionalities for drawing EU funds in the 2014–2020 financial period in the field of transport;
- to provide the basis for preparing the resolution on the national programme for constructing transport infrastructure or a suitable operational programme.

Legal basis

The legal bases for the preparation of the Strategy are:

- Article 2 of the Government of the Republic of Slovenia Act (Official Gazette of Republic of Slovenia [Uradni list RS], Nos. 24/05 – official consolidated text, 109/08, 38/10–ZUKN, 8/12, 21/13,47/13–ZDU–1G and 65/14), which stipulates that the Government shall determine, direct and coordinate the implementation of national policy in accordance with the Constitution, acts and other general legal acts of the National Assembly. To that end, it shall issue regulations and adopt the legal, political, economic, financial, organisational and other measures required in order to provide for the development of the state and the regulation of conditions within the competence of the state in all areas;
- Article 38 of the Public Administration Act (Official Gazette of Republic of Slovenia [Uradni list RS], Nos. 113/05–UPB4, 126/2007–ZUP–E, 48/09, 8/10–ZUP–G, 8/12–ZVRS–F and No. 21/12), which stipulates that the Ministry of Infrastructure shall perform tasks in the departments of railway, air and maritime transport, road and inland waters transport, excluding road traffic safety control, and tasks in the departments of transport infrastructure and cableway installations.

Preamble

Pursuant to new systemic solutions, the ministry competent for transport proposed the adoption of the Transport Development Strategy in the Republic of Slovenia, which the Government of the Republic of Slovenia adopted at its 48th regular session on 29 July 2015 – decision no. 37000-3/2015/8

1 Summary

After gaining independence, the Republic of Slovenia intensively initiated the construction of the motorway cross on the pan-European Corridors V and X. There was also a great need to modernise the existing railway transport network. Due to the lack of sufficient resources to address both fields, only the most urgent investments were implemented on railways, with certain exceptions, which included regular and investment maintenance, which was executed to a limited extent. It was planned to begin the major cycle of investments in railway infrastructure after the completion of the motorway cross.

Major investment in railway infrastructure was determined in the Resolution on the Transport Policy of the Republic of Slovenia from 2006 (Intermodality – time for synergy) (Official Gazette of Republic of Slovenia [Uradni list RS], No. 58/06). Although most of the motorway network has already been constructed, investments in railway infrastructure became more intensive after the completion of the 2007–2013 financial framework, i.e. between 2013 and 2015, when Slovenia wanted to use cohesion funds allocated in the relevant financial framework; however, a clear vision about how to manage investment in infrastructure was lacking.

Once the investments in railway infrastructure began, investments in national road network came almost to a complete standstill. The condition of state roads is deteriorating and the state of certain bridging structures is critical. Investing in this field must thus also be enabled; in addition to ensuring major investments for the attainment of suitable capacities on the railway network. Currently, insufficient resources are provided for the aforementioned issues.

One of the reasons for this is the economic and financial crisis, including the lack of a comprehensive investment programme for transport infrastructure.

On 15 November 2012 at its 37th regular session, the Government of the Republic of Slovenia (hereinafter also the Government), issued under item 1.13 when discussing information in relation to the proposal for a Regulation on Union guidelines for the development of the trans-European transport network and the proposal for a Regulation establishing the Connecting Europe Facility, Decision no. 54948–24/2012/4, thereby ordering the Ministry of Infrastructure to prepare a harmonised plan of investments in transport infrastructure up to 2020, including a vision up to 2030, and for a longer period only if this is beneficial when reviewing the integrity of investments, and that this information and discussion by the Government of the Republic of Slovenia should also be considered.

In April 2013, a working group was appointed to prepare the Resolution on the National Programme for the Development of Transport Infrastructure in the Republic of Slovenia until 2020 with a Vision until 2030 (hereinafter: Resolution).

The purpose of the Resolution is to:

- determine the comprehensive development of transport and transport infrastructure by 2030 (and beyond, if this is necessary for the integrity of the task);
- facilitate regular and proportionate financing of transport infrastructure;
- facilitate the basis for drawing EU funds in the 2014–2020 financial framework (so-called ex-ante conditionalities).

The latter purpose expanded the field of the Resolution as per the primary purpose, since, in addition to transport infrastructure, it was necessary to include the management, maintenance and operations of the transport system, and also public passenger transport, intelligent transport systems (telematic applications), logistics and infrastructure for alternative fuels. Therefore, this did not exclusively involve a national programme for infrastructure, but an integral approach to

transport, which can ensure greater synergies in achieving the goals of the transport and spatial policy of the state, as well as other policies affected by transport (environment), or is of key importance to them (the economy).

Facilitating ex-ante conditionalities for drawing EU funds came to the foreground in 2014, whereby EU representatives and their technical assistance group (EIB – Jaspers) demanded that a document including general measures be drafted for this purpose. The direction was to focus on all the necessary measures in the transport field in the Republic of Slovenia, irrespective of the finance and time period, and study all possible alternatives for resolving one problem, or resolving several problems with one or several measures. It was furthermore highlighted not to focus on concrete projects which were already prepared for implementation in order to prevent determining their eligibility in advance. Projects must be formed according to a suitable procedure when drafting eligibility studies, whereby possible alternatives (if any) are also assessed; environmental, spatial and social acceptability must also be observed. The selection of an individual project must be justified by means of a cost-benefit analysis (CBA).

Therefore, it was decided that the preparation and adoption of this document would be divided into two phases, and that, firstly, the Transport Development Strategy of the Republic of Slovenia (Strategy) would be adopted, followed by the operational plan for its implementation with an order of priority for implementing investments, financial resources, deadlines and responsible holders.

The preparation of the Strategy involved the following:

- suitable transport legislation of the Republic of Slovenia and the EU was examined and summarised;
- the Spatial Development Strategy of the Republic of Slovenia from 2004 was examined and summarised;
- the SWOT analysis (strengths, weaknesses, opportunities and threats) was drafted;
- the vision, objectives and indicators were determined;
- the national transport model was used for the analysis of actual needs, and on its basis:
  - the "0" development analysis was drafted;
  - four possible development alternatives were formed and analysed;
  - the fifth, the so-called best possible alternative, was prepared;
- only the "0" analysis was used when preparing the Strategy (due to the aforementioned requirements regarding the "ex-ante conditionality"):
  - a comprehensive environmental impact assessment (CEIA) was implemented, which included the preparation of:
    - report on the scope of the CEIA;
    - environmental report on the comprehensive assessment of environmental impacts (ER);
  - a positive opinion from the relevant ministry on the suitability of the ER was obtained;
  - public discussion of the Strategy and the environmental report for the comprehensive assessment of environmental impacts, and
  - the cross-border assessment;
- an analysis of comments received during the public discussion was implemented, and the positions on the comments were drafted, on the basis of which the Strategy and the ER were amended;
- the competent ministry will issue a final decision on the suitability of the ER and the observance of its recommendations in the Strategy;
- the Strategy will then be confirmed by the Government of the Republic of Slovenia.

The transport policy vision is defined as the provision of the sustainable mobility of the population and supply to the economy with the following objectives:

- to improve mobility and accessibility;
- to improve supply to the economy;
- to improve traffic safety and protection;
- to reduce the use of energy;
- to reduce costs to users and operators;
- to reduce environmental burdens.

The preparation of the Strategy included a fully developed and applicable national transport model comprising the internal and external transport model (within the EU and outside of it) and models of environmental impacts and traffic safety. All models are combined into a whole and are strategic.

The model of environmental impacts and traffic safety has been developed only for Slovenia. Both passenger and goods transport were modelled.

The following problems were revealed when analysing the "0" alternative, which anticipates that nothing would be done in the future in the field of transport except to maintain the existing condition and complete the current investments:

- transport by passenger vehicles will increase, while public passenger transport will decrease;
- road haulage will increase at the expense of rail transport;
- the capacity of railway lines will be exceeded almost everywhere;
- road users will face constant congestion, primarily on roads entering the capital;
- there will be great lack of parking areas for lorries;
- railways will not meet the standards for the core TEN-T network by 2030 as demanded by the EU regulation on this field;
- the accessibility of regional centres will decrease;
- the development of the Port of Koper will be disabled due to the lack of railway capacity;
- traffic safety will worsen in all areas of transport, particularly road transport;
- the negative impact of transport on the environment will increase beyond the limits adopted at the EU level and in Slovenia (pollutants of ambient air, greenhouse gas CO2, noise etc.);
- the quality of life in cities and in rural areas will worsen due to the external costs of transport (congestion, accidents, higher emissions of greenhouse gases and noise, increased fuel costs, less free time).

On the basis of the above starting points and findings, a proposal for the Strategy was prepared. When drafting the proposal, we aimed at the maximum utilisation of the capacity of the existing transport infrastructure, with solutions which do not require great financial contributions, such as transport management systems, the introduction of intelligent transport systems, minor investments and similar. Where such measures do not provide satisfactory results, we focused on major investments; however, we also observed problems established at the expert level in these cases (with the application of the transport model).

The general guideline entailed an emphasis on environmentally friendly modes of transport (railway) and sustainable mobility in accordance with national and EU policies and legislation in the relevant field.

While observing the current economic and financial situation in Slovenia and recommendations of the environmental report for the CEIA, a general recommendation was provided for each infrastructural measure in the Strategy to first examine the possibility of attaining suitable effects on the existing infrastructure (by upgrading, reconstructing, modernising etc.). If this is impossible, new routes should be determined partly or in whole. If credible studies have already been made for this purpose, they should not be done again; if they have not, we propose to draft them regardless of the already adopted plans and projects. From the viewpoint of the economy, this is deemed

urgent by the Strategy, since the projects must follow measures from the Strategy, but above all, the solutions must be founded on realistic problems and ascertainable needs. The preparation and selection of a suitable project must be justified by a cost-benefit analysis and while observing environmental limits.

Special objectives were designed to establish them, i.e.:

- to improve transport connections and harmonisation with neighbouring countries;
- to improve national and regional connections within Slovenia;
- to improve passengers' accessibility to the main urban agglomerations and within them, and
- to improve the organisational and operational structure of the transport system to ensure system efficiency and sustainability.

The purpose of the general objectives is to attain effects in transport in the future, and the purpose of the special objectives is to obtain the efficiency or eligibility of measures.

On the basis of forecast of traffic flows, traffic safety, environmental impacts and social acceptability (accessibility required on the basis of the Spatial Development Strategy of Slovenia), future measures in transport were determined for all modes of transport (maritime, air, railway, road) and for public passenger transport or sustainable mobility. The following measures were defined:

- 29 measures for railways;
- 37 measures for roads;
- 22 measures for public passenger transport or sustainable mobility;
- 14 measures for waterborne transport (sea and inland waterways), and
- 6 measures for air transport.

A total of 108 measures, which do not refer only to infrastructure, but also to the organisation, traffic management, traffic safety and vehicle fleet, which is displayed in the table below.

Table 1.1:
Number of measures

	Measures on the elements (sections) of the network	Measures on the network	Organisational (horizontal)
Railway network	11	4	14
Road network	22	7	8
City (urban) network	4	7	11
Waterborne transport	6	3	5
Air transport	3	2	1
Total	**46**	**23**	**39**

The Strategy is categorised as a programme that has a significant impact on the environment. For this reason, it is necessary, in accordance with Directive 2001/42/EC on the assessment of the impacts of certain plans and programmes on the environment, to assess the consequences of the impacts of planned measures and alternative measures on the environment in the Strategy in the comprehensive assessment of impacts on the environment before its adoption and take a position on measures that are unacceptable due to their environmental impact. Directive 2001/42/EC requires Member States to take a position on the cross-border effects of planning and programmes and to consult on them.

The ministry responsible for the environment has issued Decision no. 35409-24/2012/14, on the basis of which it is necessary, along with the drafting of the Resolution and in accordance with the Environment Protection Act, to carry out a comprehensive environmental impact assessment, and within this procedure, also an assessment of the acceptability of the plans' impact on

protected areas on the basis of the Nature Conservation Act. The Strategy thus concludes with environmental recommendations.

The purpose of the comprehensive environmental impact assessment is to provide a high level of environmental protection and contribute to the inclusion of environmental aspects in the drafting of the Strategy. Therefore, the authors of the Environmental Report were included in the process of drafting this document already in the initial phase of its preparation.

In accordance with the Decree laying down the content of environmental reports and on the detailed procedure for assessing the effects on certain plans and programmes on the environment (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 73/05), the impacts of implementing the Strategy on the environment (soil, mineral resources, air, water, climate factors, nature, cultural heritage, landscape, human health, population and material assets) were defined, described and assessed in the environmental report. The Annex for assessing the acceptability of effects caused by the execution of plans in protected areas is enclosed as a separate document.

The environmental assessment is conducted as per environmental aspects and by groups of measures of the Strategy, namely in terms of the attainment of an individually defined environmental objective. In general, it was established that all groups of measures are acceptable from the environmental aspect with the suitable placement of spatial interventions and implementation of all necessary mitigation measures.

The results of the assessment of alternatives (road, rail, air, maritime, public passenger transport) indicate that almost all the envisaged measures are fully or partially in line with environmental objectives, whereby at least basic mitigation measures arising from the legislation will have to be provided in order to reduce environmental impacts in almost all interventions. Individual measures in the railway, road and air networks were assessed as conditionally compliant according to the respective environmental objectives.

2 Strategy starting points

2.1 Introduction

After gaining independence, the Republic of Slovenia intensively initiated the construction of the motorway cross on the pan-European corridors V and X. There was also a great need to modernise the existing rail transport network. However, only the most urgent investments were implemented on railways, with certain exceptions, which included regular and investment maintenance executed to a limited extent. It was planned to begin the major cycle of investments in railway infrastructure after the completion of the motorway cross,which was determined in the Resolution on the Transport Policy of the Republic of Slovenia from 2006 (Intermodality – time for synergy) (RePPRS)(Official Gazette of Republic of Slovenia [Uradni list RS], No. 58/06). Although most of the motorway cross was constructed, the investment cycle did not continue with investments in railway infrastructure. The economic and financial crisis was one of the reasons, as well as the absence of a comprehensive investment programme for transport infrastructure.

Therefore, at its 37th regular session on 15 November 2012, the Government of the Republic of Slovenia issued under item 1.13 when discussing information in relation to the proposal for a Regulation on Union guidelines for the development of the trans-European transport network and the proposal for a Regulation establishing the Connecting Europe Facility, Decision no. 54948–24/2012/4, thereby ordering the Ministry of Infrastructure to prepare a harmonised plan for investments in transport infrastructure up to 2020, including a vision up to 2030, and for a longer period only if this is beneficial when reviewing the integrity of investments, and that this information and discussion by the Government of the Republic of Slovenia should also be considered.

For this purpose, the Minister of Infrastructure, Samo Omerzel, appointed a working group to prepare the Resolution on the National Programme for the Development of Transport Infrastructure in the Republic of Slovenia until 2020 with a Vision up to 2030 (hereinafter: Resolution) in April 2013.

The purpose of the Resolution was to:

- determine the comprehensive development of transport and transport infrastructure by 2030 (and beyond, if this is necessary for the integrity of the task);
- facilitate regular and proportionate financing of transport infrastructure;
- facilitate the basis for drawing EU funds in the 2014–2020 financial framework (so-called ex-ante conditionalities).

The latter purpose expanded the field of the Resolution as per the primary purpose, since, in addition to transport infrastructure, it was necessary to include at least public passenger transport, intelligent transport systems (telematic applications), logistics and infrastructure for alternative fuels. Therefore, this did not exclusively involve a national programme for infrastructure, but an integral approach to transport, which can ensure greater synergies in achieving the goals of the transport and spatial policy of the state, as well as other policies affected by transport (environment), or is of key importance to them (economy).

Facilitating ex-ante conditionalities for drawing EU funds came to the foreground in 2014, when working on the Resolution. Furthermore, EU representatives and their technical assistance group demanded that a document including general measures be drafted for this purpose, regardless of the finances needed for their realisation and maturity. During the preparation of the Resolution, coordination meetings took place with individual directorates and services within the Ministry of Infrastructure and operators of the current transport infrastructure.

As per the aforementioned and in accordance with the agreements at coordination meetings, it was determined that the preparation and adoption of the Resolution should be divided into two phases: firstly, the Transport Development Strategy of the Republic of Slovenia (Strategy) would be adopted followed by the plan for its implementation, with an order of priority for implementing investments, financial resources, deadlines and responsible holders. Based on this, we propose that the Government of the Republic of Slovenia adopt the Transport Development Strategy in the Republic of Slovenia (hereinafter: Strategy).

The document of the Strategy was structured as follows:

- The first chapter describes all starting points which needed to be considered when preparing the Strategy: European and national legislation, a situation analysis of transport development considering sectorial legislation and some relevant studies facilitating the determination of measures.
- The second chapter describes the organisation of the ministry responsible for transport in the Republic of Slovenia and its competence for implementing tasks in the field of transport.
- The third chapter presents the transport model, the analysis of traffic flows in 2030 and their assessment, including proposed measures. The existence of the national transport model was one of the key conditions for confirming the Strategy as the applicable document regarding ex-ante conditionalities for drawing EU funds.
- This is followed by a SWOT analysis of transport in the Republic of Slovenia as a whole and for individual sectors.
- The fifth chapter determines the vision of transport development in the Republic of Slovenia and general objectives (what we want to achieve in this field) and the indicators used to monitor the realisation of objectives.
- This is followed by the determination of data processing areas. It needs to be emphasised that the areas presented in the Strategy present only traffic-gravitational areas, where closed-area transport work is implemented.
- The seventh chapter determined problems, specific objectives (what we must achieve with measures) and measures at the general level.
- The final chapter includes a brief introduction to the comprehensive environmental impact assessment (hereinafter: CEIA). The latter is the second key requirement regarding ex-ante conditionalities for drawing EU funds. The environmental report on CEIA can be found in the Annex, and was prepared on the basis of measures determined in this Strategy.

2.2 Slovenia's geographical position and some key challenges

Its geographical location and history make Slovenia an intensive transport and transit area and the crossroads of the two major pan-European corridors (Figure 1), i.e. corridors V and X, which were determined at the European conference of transport ministers on Crete in 1994 and in Helsinki in 1997 (CEMT – Conférence Européenne des Ministres de Transport). This division is mentioned because it is the most familiar in Slovenia.

The corridors run as follows (see figure below):

- Corridor V: Venice – Trieste/Koper – Ljubljana – Maribor – Budapest – Uzhhorod – Lviv – Kiev;
- Corridor X: Salzburg – Ljubljana – Zagreb – Belgrade – Niš – Skopje – Veles – Thessaloniki.

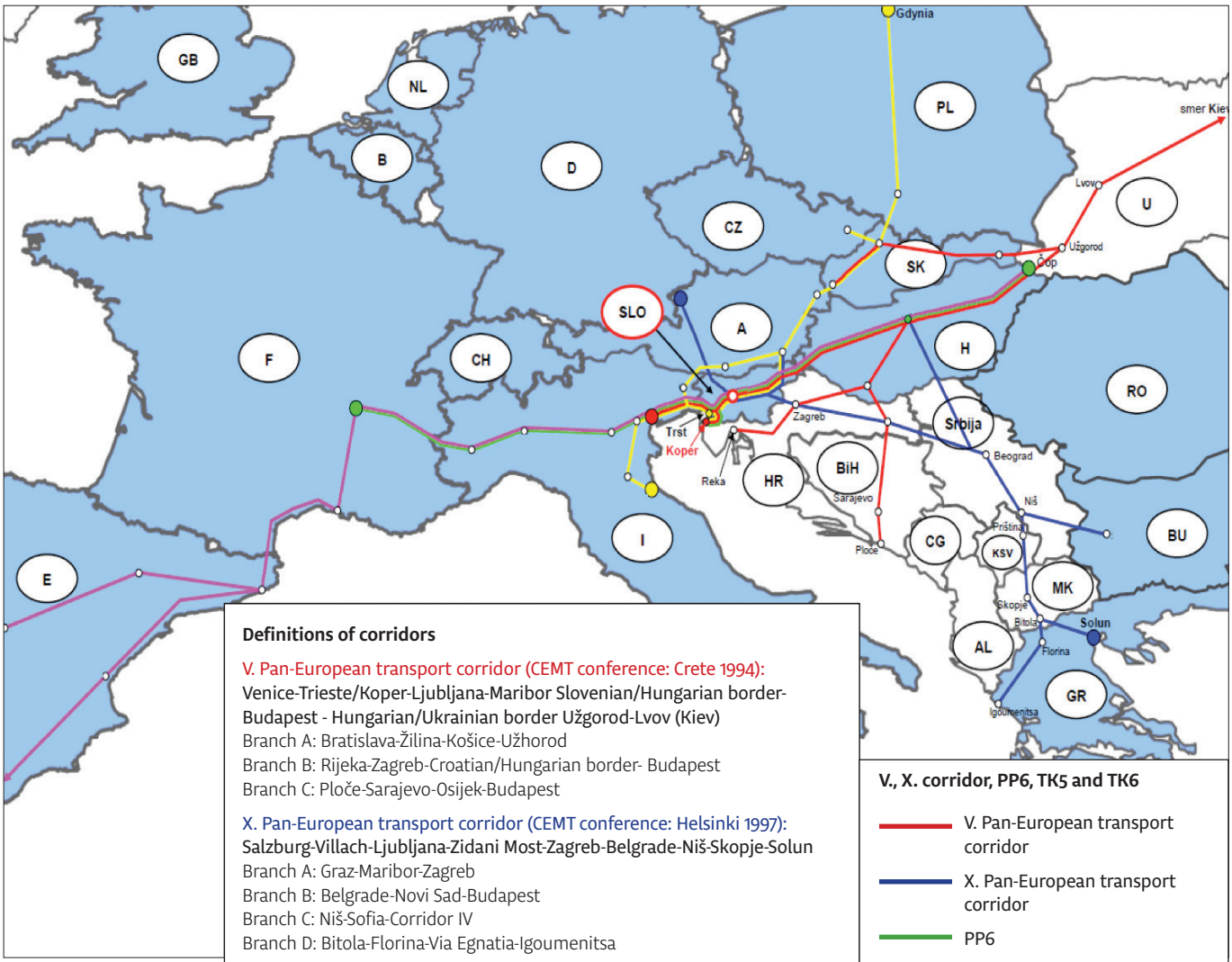
Corridor Xa also runs across Slovenia, i.e. Graz – Maribor – Zagreb.
Each of these trans-European corridors has its own branches, i.e.:

- on corridor V:
  - Branch A: Bratislava – Žilina – Košice – Uzhhorod;
  - Branch B: Rijeka – Zagreb – Budapest;
  - Branch C: Ploče – Sarajevo – Osijek – Budapest.
- In addition to the mentioned Xa branch, Corridor X also includes:
  - Branch B: Budapest – Novi Sad – Belgrade;
  - Branch C: Niš – Sofia – Plovdiv – Dimitrovgrad – Istanbul (via Corridor IV);
  - Branch D: Veles – Prilep – Bitola – Florina – Igoumenitsa.

Some of the branches on individual corridors compete, e.g. the basic route of Corridor V and its branches B and C, including the basic route of pan-European Corridor X and its branches A and B.

Figure 1.
Routes of pan-European corridors V and X

Source: MzI.



Note: Figure is from 2012 when Croatia was not yet an EU Member State. Source: MzI.

In Slovenia, the trans-European network or TEN-T, which is divided into a comprehensive and core network, runs on the same routes as the aforementioned pan-European corridors.

To implement the core TEN-T network in the financial framework from 2014 to 2020, the European Commission formed, and the Council of Europe and the European Parliament harmonised and confirmed, the corridors of the core network. In these corridors, Slovenia is included in the so-called Mediterranean and Baltic-Adriatic Corridors. Both run across Slovenia in the SW-NE direction; the first one continues from Pragersko to Hungary or from Zidani Most to Croatia on the western side, and the second from Šentilj to Austria. The TEN-T network and the core network corridors are described in more detail in other chapters.

In the recent economic crisis, traffic flows declined by approximately 20%. In strategic terms, the crisis period must be used to prepare transport infrastructure for the period after the crisis, when increases in traffic flows follow economic growth, which will be simultaneously stimulated by traffic. Transport and economic growth are known to be related. From a developmental aspect, transport infrastructure enables people access to functional places (jobs, services) and stimulates the development of economic activities. Jobs and services of public importance are mainly concentrated in urban – economic centres. Infrastructural systems support their integration into European economic currents and contribute to the harmonised development of areas, thus enabling the mutual augmentation of functions of rural and urban areas.

The Resolution on the Transport Policy of the Republic of Slovenia adopted in 2006 indicates the significant trends in the development of the transport industry and modified values in planning transport policy. Along with traditional infrastructural solutions, the so-called co-modal theory of transport planning arises, which in combination with sustainable policy presents new challenges also for transport policy planners in Slovenia.

This document includes four areas of classic transport infrastructure: roads, railways, and the maritime and aviation industries, as well as sustainable population mobility planning (cycling, PPT – public passenger transport) and economic supply (transport logistics, intermodal hubs etc.). Logistical centres should be located in appropriate locations, because rationality and cost-efficiency depend on the appropriate comprehension of needs (economy) and the appropriate localisation of hubs next to major Slovenian transport corridors.

The following movement in the mindset also denotes the realisation of the internalisation of external costs. The user pays for all costs incurred. From a national standpoint, emissions (in Slovenia mostly due to natural conditions, especially PM10 particles), accidents, noise, congestion and wear of road surfaces cause costs that need to be charged to decision makers at contracting authorities or entities who pay for transport (logistics companies, carriers, buyers or suppliers). Therefore, an electronic tolling system must be introduced.

Investments in transport infrastructure demand substantial funds, which the Republic of Slovenia cannot entirely realise based on its own budgetary funds. It is necessary to seek interested private partners for projects and include them in project preparation and management processes at an early stage. European funds and Slovenian budgetary funds must also be acquired and utilised to the maximum extent possible.

In the past twenty years, the Republic of Slovenia has adopted some strategic documents in the field of transport policy, including the Resolution on the Transport Policy of the Republic of Slovenia, Spatial Development Strategy of Slovenia, Development Strategy of Slovenia and partial national programmes as executive acts. These documents represent the bases or starting points of the Transport Development Strategy in the Republic of Slovenia. In order to understand the consequences of guidelines or policies in this field so far, it is necessary to present the development of current traffic flows by individual types of transport.

2.3 Transport in strategic documents

2.3.1 Transport in the light of the Resolution on the Transport Policy of the Republic of Slovenia (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 35/02 and 60/04)

The National Assembly of the Republic of Slovenia adopted the Resolution on Transport Policy in 2006, which in a contemporary, concise and simple way determined the fundamental guidelines for the future of transport in the Republic of Slovenia by defining the starting points, vision, objectives and measures. The starting points show the situation analysis by the realised partial policies of past years in the field of passenger and cargo transport, infrastructure, safety and protection, as well as environment protection, which conditioned the situation in this area which had existed until that time. Transport policy is based on mobility, accessibility, environment protection, safety and protection, economic development, the optimal utilisation of resources, intermodality/ interoperability and a balance between transport systems.

Transport policy planners fully considered the principles of sustainable development. They consistently determined the objectives and measures of transport policy in all the complexity of sustainable development, which equally, simultaneously and independently consider all three dimensions of sustainable development: the economy, society and the environment.

The main objectives of transport policy are: achieving a socially optimal situation referring to the transport sector; increasing transport safety and security; the efficient use of energy and clean environment; increasing the scope and quality of public road and rail passenger transport; harmonised operations of the entire transport system; establishing the architecture of intelligent transport systems by observing regional, national and European

characteristics, guidelines and interests; ensuring the necessary transport infrastructure for land, maritime and air transport that follows the principles of sustainable and harmonised regional development; ensuring reliable, safe, price-efficient, competitive and environmentally-friendly transport in cargo and passenger transport; optimum utilisation of available resources; establishing the functioning of market economy effects; selling state-owned shares and deregulation where private services providers can ensure a more competitive and better quality service according to market economy principles, whereby the level of safety may not be reduced; accurate guidance with fiscal measures to facilitate those services which cannot be ensured according to market economics principles.

Public interest in the field of ensuring population mobility is connected to social and ecological factors. The Resolution on Transport Policy enables the planning of implementing project documentation in relation to sustainable development: national programmes and special acts.

The Resolution on the National Programme for the Development of Transport Infrastructure also states that the management, organisation and financing of public passenger transport will have to be combined in one place. Passengers will have to be educated and encouraged to use public transport and to use passenger transport in an intermodal manner.

Supply to companies must also be based on sustainable development. Therefore, transport policy measures plan the creation of a system for charging usage fees for infrastructure based on market conditions.

The state will encourage research and development in the transport sector, in the economy and education; thus it will strengthen the scope and power of the transport sector, as well as create jobs.

The general measures of transport policy in the Resolution on the National Programme for the Development of Transport Infrastructure also anticipate the preparation of a comprehensive transport model with appropriate tools for system support, the preparation of a state developmental plan on the optimal harmonisation of the transport system and the development of transport infrastructure, which is a condition for the uniform and synchronous operations of the system. Emphasis is on guaranteeing the appropriate infrastructure of public passenger transport, railways, state roads and logistics centres, as well as ports and airports. From the economic aspect, private capital will be engaged in the development of transport infrastructure where the desired results could be obtained by private initiative and, as a result, relieve public finance. Fiscal measures used by the state to stimulate the foundation of comprehensive logistical solutions and a uniform public passenger transport system are the state's answer to transport carrier issues.

From the ecological standpoint, entities implementing the transport policy must enable the development of new transport techniques and technologies which will be less burdening on the environment, and stimulate the use of more energy-efficient and ecologically-friendly vehicles.

Together with modified social habits and economic dynamics in Slovenia, appropriate education, notification and marketing are necessary in order to raise people's awareness of the significance of the transport system, its operations and the optimum use of transport infrastructure.

Actual development in this field was somewhat different from the ambitious objectives of the Resolution on the National Programme for the Development of Transport Infrastructure concerning the sustainable development of transport and environmentally-friendly transport modes. After gaining independence, Slovenia managed to construct only a direct railway connection with Hungary in the field of railway infrastructure development. This project has proven exceptionally important since both countries joined the EU, as the route has become more competitive. Furthermore, 20 years ago we witnessed the redirection of traffic flows to the fifth railway corridor, while traffic on the tenth corridor is slowly coming to life, mostly due to non-harmonised railway management in this area. The current situation and trafficability were preserved on other parts of the railway infrastructure.

The construction and maintenance of railway infrastructure, in addition to organisational and technological aspects, are also key success factors in a more open, marketable and competitive space, where railways, which acquire almost 60% of the cargo via the Port of Koper, can now be found. The Port of Koper has constantly increased transhipment in recent decades, and become a key transport hub of European importance.

In the development of state roads in the past twenty years, Slovenia has particularly prioritised the construction of roads for long-distance traffic, i.e. motorways in the trans-European road network, and expressways. The remaining network of state (main and regional) roads was mostly maintained and preserved; by primarily eliminating bottlenecks, the goal was to increase traffic capacity and safety. This development of the national road infrastructure enabled the accelerated development of areas along the motorway network, while the connectivity and access of other areas to the motorway system did not improve in this period. The general situation of the existing national road network (main and regional roads) even worsened in this period. This situation limits the harmonious regional development of areas which are not situated near the motorway network. Due to poor access and higher transport costs, these areas are becoming non-competitive in terms of location, even if they have other resources needed for development (cheaper land, qualified workforce etc.).

We must not forget Slovenia's airports and navigation air transport services, which contribute significantly to the development mostly of passenger but also cargo transport.

Progress in the sense of combining carriers and modernising public passenger transport has only just begun.

If such a policy of encouraging road transport continues, the results will not be in accord with the objectives of the Resolution on Transport Policy. Table 2.1 below shows forecast traffic flows on motorways for 2030 and exceeding the AADT.

Table 2.1:
Number of vehicles/ year on individual motorway sections in the Republic of Slovenia in 2009 and 2030

	2009			2030		
Section	freight transport - no. of trucks	passenger transport – no. of pass. cars	total vehicle	freight transport - no. of trucks	passenger transport – no. of pass. cars	total vehicle
1. Beltinci–Pince/Tornyiszentmiklos	1,340,000	1,533,000	2,873,000	2,152,656	2,462,703	4,615,359
2. Divača–Koper	1,330,000	6,480,575	7,810,575	2,136,592	10,410,784	12,547,376
3. Draženci–Donji Macelj (border)/Gruškovje	311,345	8,183	319,528	460,995	12,090	473,085
4. Fernetiči/Trieste–Divača	1,660,000	3,200,685	4,860,685	2,666,723	5,141,772	7,808,495
5. Hrastje–Lešnica	1,200,000	5,845,475	7,045,475	1,927,752	9,390,521	11,318,273
6. Karavanke–Vrba	790,000	2,938,250	3,728,250	1,269,103	4,720,181	5,989,284
7. Kronovo–Obrežje/Bregana (border)	820,000	3,970,105	4,790,105	1,317,297	6,377,815	7,695,112
8. Lešnica–Kronovo	1,230,000	5,657,500	6,887,500	1,975,946	9,088,547	11,064,493
9. Ljubljana Koseze–Ljubljana Kozarje	4,690,000	22,734,025	27,424,025	7,534,297	36,521,300	44,055,597
10. Ljubljana Kozarje–Ljubljana Malence	3,850,000	18,625,220	22,475,220	6,184,871	29,920,669	36,105,540
11. Ljubljana Kozarje–Postojna	4,100,000	15,680,035	19,780,035	6,586,486	25,189,348	31,775,834
12. Ljubljana Malence–Pluska	1,900,000	11,107,680	13,007,680	3,052,274	17,844,043	20,896,317
13. Ljubljana Šentvid–Ljubljana Koseze	1,820,000	11,834,760	13,654,760	2,923,757	19,012,068	21,935,825
14. Maribor Pesnica–Maribor Slivnica	2,500,000	6,908,355	9,408,355	4,016,150	11,097,995	15,114,145
15. Maribor Pesnica–Vučja vas	2,010,000	3,559,115	5,569,115	3,228,984	5,717,576	8,946,560
16. Maribor Slivnica–Draženci	890,000	4,599,730	5,489,730	1,429,749	7,389,282	8,819,031
17. Maribor Slivnica–Ljubljana Malence	3,380,000	11,021,540	14,401,540	5,429,835	17,705,662	23,135,497
18. Pluska–Hrastje	1,226,400	6,548,100	7,774,500	1,970,162	10,519,260	12,489,422
19. Podtabor–Ljubljana Šentvid	1,400,000	12,910,415	14,310,415	2,249,044	20,740,064	22,989,108
20. Postojna–Divača	2,640,000	8,215,785	10,855,785	4,241,054	13,198,329	17,439,383
21. Postojna–Rupa (border)/Jelšane	111,325	5,520	116,845	363,905	14,390	378,295
22. Šentilj–Maribor Pesnica	1,200,000	3,984,340	5,184,340	1,927,752	6,400,683	8,328,435
23. Vrba–Podtabor	1,220,000	8,077,815	9,297,815	1,959,881	12,976,686	14,936,567
24. Vučja vas–Beltinci	1,710,000	2,741,150	4,451,150	2,747,046	4,403,548	7,150,594

Source: MzI, within the scope of data sent to TENtec portal of the European Commission. (The above traffic data served as the bases for commencing the preparation of the Strategy. Its preparation involved a credible transport model, by means of which a more accurate and reliable traffic forecast was drafted, which is presented in Chapter 3.)

One of the key guidelines in the Resolution on Transport Policy of the Republic of Slovenia is the transition to environmentally friendly forms of transport, especially rail; however, this transition should be well designed. The framework limit capacity for motorways is 65,000 AADT (average annual daily traffic) or 23,725,000 vehicles per year. When traffic approaches the limit values, it needs to be demotivated and redirected. The forecast of traffic flows on motorways up to 2030 in comparison with 2009 favours the transition to environmentally-friendly methods of transportation.

Table 2.1 shows that all motorway sections to Ljubljana and the whole of corridor V would present bottlenecks in 2030. Therefore, railway goods transport and public passenger transport will have to be stimulated on these sections.

The railway network in the Republic of Slovenia will have to be modernised for this purpose in order to enhance its capacity for a great increase in goods and passenger transport. Chapter 1.9 shows how the corridors that run across Slovenia have advantages over competitive corridors. Therefore, it is necessary to illustrate the potential of railways in order to argue for the applicability of the guidelines of Slovenia's transport policy if Slovenian railway corridors were modernised regarding comparable competing corridors. This is shown in Table 2.2.

Table 2.2:
Quantity of goods (t) and no. of passengers per year on individual railway sections in the Republic of Slovenia in 2009 and 2030

	2009		2030		% growth 2009/2030	
Section	no. of passengers/ year	tons of goods/ year	no. of passengers/ year	tons of goods/ year	passengers/ year	goods/ year
Pragersko–Ormož	616,258	2,338,394	3,541,595	8,583,340	575%	367%
Divača–Koper	261,511	7,815,977	692,770	18,915,402	265%	242%
Divača–Pivka	388,185	10,049,858	1,991,440	22,356,250	513%	222%
Divača–Sežana	229,813	2,987,066	359,890	10,667,125	157%	357%
Dobova–Krško	540,966	2,576,400	2,756,480	13,692,975	510%	531%
Border with Croatia–Ilirska Bistrica–Pivka	53,798	434,310	76,852	940,256	143%	216%
Jesenice–Ljubljana	1,996,042	3,793,732	3,229,155	13,141,095	162%	346%
Krško–Zidani Most	1,124,900	2,744,400	3,329,530	13,734,585	296%	500%
Maribor–Pragersko	1,519,329	3,238,000	5,292,500	14,942,005	348%	461%
Ormož–Središče ob Dravi (border with Croatia)	36,846	359,000	71,300	1,344,975	194%	375%
Pivka–Ljubljana	973,000	10,102,201	3,009,060	23,976,120	309%	237%
Hodoš–Ormož	401,975	2,897,730	3,102,500	7,935,830	772%	274%
Border with Austria–Jesenice	373,960	3,406,000	1,095,000	13,252,055	293%	389%
Šentilj–Maribor	147,898	3,892,796	196,852	7,068,590	133%	182%
Sežana–border with Italy	229,813	2,987,066	359,890	10,667,125	157%	357%
Zidani Most–Ljubljana	6,744,063	9,626,500	8,421,000	28,316,700	125%	294%
Zidani Most–Pragersko	1,882,474	5,267,348	5,319,145	14,942,005	283%	284%

Sources:
–for 2009: MzI, within the scope of data sent to the TENtec portal of the European Commission;
–for 2030: PNZ and DRI study (2011) of the advantages of corridors running across Slovenia.

The percentage of growth shows the capacity of rail transport in the Republic of Slovenia. The essential assumption is that if the Slovenian railway network is modernised by 2030, it will be comparable with the competitive network on Corridors V and X. If this is not the case, rail transport will stagnate, road transport will suffocate and become congested, as well as pollute the environment, thus harming the economy and Slovenian residents.

2.3.2 Spatial Development Strategy of Slovenia (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 76/04)

The Spatial Development Strategy of Slovenia is the fundamental state document governing spatial development. It stipulates objectives, priorities and the global basis for the state's spatial development, including transport infrastructure; it provides developmental guidelines for settlements, infrastructure and the landscape as well as measures for their implementation. From the hierarchical aspect, it is the most important spatial document, to which all other spatial acts at the national and municipal levels must be adjusted; this is verified in various procedures, in the case of the national spatial plan in the phase of considering an initiative for preparation and in the guidelines and opinions phase in the case of municipal spatial acts.

Slovenia's spatial development is based on a polycentric urban system comprised of a two-level structured network of centres that are of national importance (Ljubljana, Maribor, Koper, Celje, Murska Sobota, Velenje, Novo mesto, Kranj, Nova Gorica, Postojna, Ptuj and conurbations Jesenice–Radovljica, Sevnica–Brežice–Krško, Dravograd–Ravne na Koroškem–Slovenj Gradec, Trbovlje–Zagorje–Hrastnik) and centres that are of regional importance, and to which the networks of other centres are connected (centres of intermunicipal and local importance) with appropriate distributions of functions. Ljubljana, Koper and Maribor are centres that are important at the international level, and this requires appropriate infrastructural connections with the relevant international area.

From the developmental point of view of Slovenia, a comprehensive transport system has the key role in economic integration in international space for connecting urban centres and other settlements as well as regions and for ensuring accessibility to jobs and services for the population and the economy in a sustainable way that is also rational from the spatial aspect. In this way, transport infrastructure supports and establishes the conditions for developing centres in the determined polycentric urban system. Jobs and services of public importance are mainly concentrated in towns/economic centres, on which the need for planned infrastructure is based, and the rank of the infrastructure is based on the role of the town/urban centre. The additional construction of infrastructure and establishment of appropriate services is required to connect various transport subsystems (hubs or terminals for passenger transport, transport terminals for combined traffic or logistics centres) to enable the efficient mobility of people and goods. The development and construction of transport infrastructure on the pan-European Corridors V and X is important for economic integration in the international space, as well as the establishment of appropriate connections with international airports (especially Ljubljana Jože Pučnik Airport) and the Port of Koper with other transport subsystems and the improvement of cross-border transport connections. The system of internal connections is also important for regional development, since these connections consist of border and peripheral transport connections, which contribute to improving accessibility to lower level centres. The target accessibility from gravitational areas to functions in urban centres of higher rank (centres of national importance) is 45 minutes, while the target accessibility of gravitational areas of lower rank centres (centres of regional importance) is 30 minutes. If delays due to traffic congestion are not considered, the target values have already been achieved, but only regarding private vehicle traffic. More attention will have to be dedicated to accessibility by public transport in order to reduce the load on the environment caused by emissions and dust in urban centres.

2.4 Situation analysis from the aspect of spatial development

As a part of large European regions – Alpine, Mediterranean, Danube and Central European – Slovenia takes on an active role and uses its geostrategic position. Public transport infrastructure may contribute to forming cross-border regions with neighbouring countries, which is important for the development of hilly and less accessible areas with numerous problems related to economic and demographic stagnation, as well as for the developmental cross-border connection of urban areas in the coastal region, Goriška, the lower Sava River and Štajerska regions.

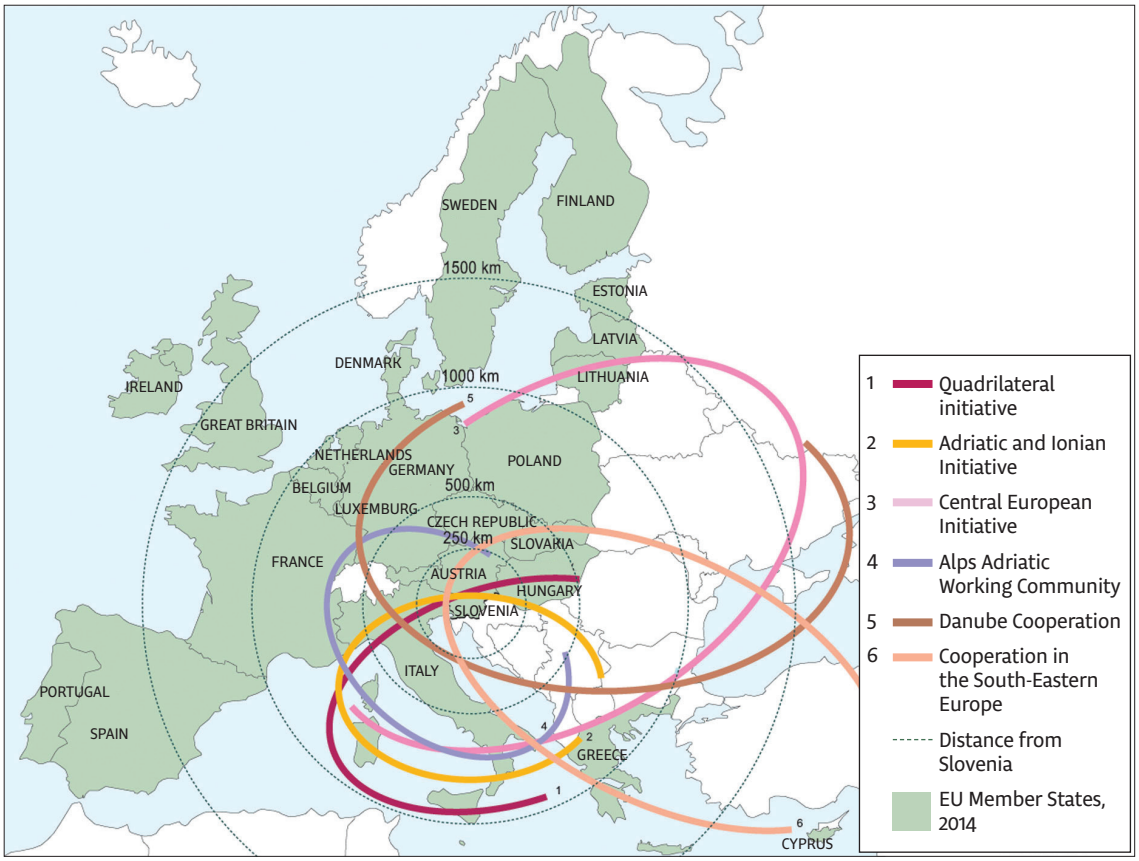
Figure 2 presents areas of international cooperation within the scope of various initiatives and working groups, which interconnect countries with regard to common interests, and in which Slovenia is integrated due to the common resolution of developmental issues in the field of spatial regulation, the economy, culture, social development, transport, the environment and similar. The quadrilateral initiative combines Italy, Croatia, Hungary and Slovenia, within which the issues of transport connection, spatial regulation and the environment are resolved in mutual cooperation. Within the scope of the Adriatic Ionian Initiative, issues of spatial development along the Adriatic and Ionian seas are examined. The Central European Initiative considers issues of development in the political, economic, social, spatial and cultural fields. The Alps Adriatic Alliance Working Community considers matters related to spatial and environment regulation, the economy, culture, society, health care and social issues, agriculture and forestry. The Danube Cooperation Process involves countries along the Danube River basin and resolves issues of development in relation to the environment and water protection. The Cooperation Process combines SE European countries, and addresses issues that are significant for their future development.

In the Danube River region, cooperation between countries has been upgraded within the scope of the adopted Macro-regional Strategy for the Danube Region. The process of establishing the Adriatic Ionian macro-region is also underway, and will strengthen the efforts of countries along the Adriatic

Sea for the sustainable development of the sea, the coast and hinterland. In the Alps Region, Slovenia is included in the process of designing a possible macro-regional strategy for the Alps through the Alpine Convention, since it is a signatory. In all three fields, the issue of transport connections is one of the key issues – related to geographically specific features – whereby intermodality (river, land and maritime transport) for greater spatial efficiency and environmental sustainability are at the forefront.

Figure 2.
Areas of international cooperation

Source: MzI, SPSS, Official Gazette of the Republic of Slovenia, No. 76/04.
Note: Figure is from 2004; thus Bulgaria, Romania and Croatia are not marked as EU Member States.

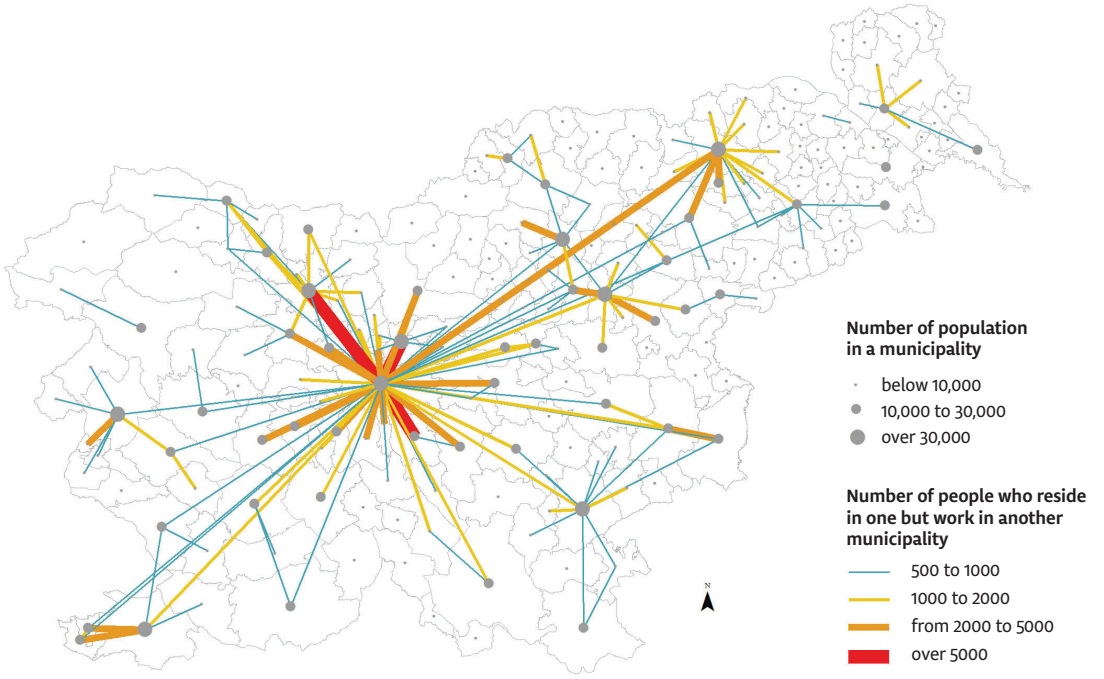


2.4.1 Transport development for improved integration between settlement areas and regions

Jobs are concentrated in areas with the highest population, activity and infrastructure density. Since the 1970s, suburbanisation has occurred, enabled by a high level of motorisation and great mobility on the road network, which has further increased in the last decade. The trend of daily commuting from suburbanised areas to major cities (employment centres) is thus characteristic of Slovenia. Daily migration in the past ten years has markedly increased, including in the areas of functional regions of major centres, whereby the role of Ljubljana as the major employment centre in the country is particularly notable. Other large employment centres which also attract numerous daily commuters are Maribor, Celje, Kranj, Novo mesto, Koper, Nova Gorica with Šempeter, Velenje, Šoštanj, Krško and Brežice. Daily commuter flows more than doubled in some areas from 1995 to 2005; in the past ten years, the growth has slowed down somewhat. Daily commuting is especially notable in the directions of the motorway cross. The increase in daily migration away from large centres to nearby municipalities has also been observed, since some rural municipalities have managed to provide more new jobs in their areas. Although the goal of attracting investors and creating jobs was to employ people from these municipalities, new jobs have led to additional daily commuting, and the people in these municipalities are still connected to urban centres outside their municipalities, thus creating the need for mobility.

Figure 3.
Presentation of daily commuters – the number of people who reside in one municipality but work in another

Source: Ministry of the Environment and Spatial Planning, Institute for Spatial Policies, 2011: How the research of the ESPON programme can support development planning in Slovenia, Interstrat.



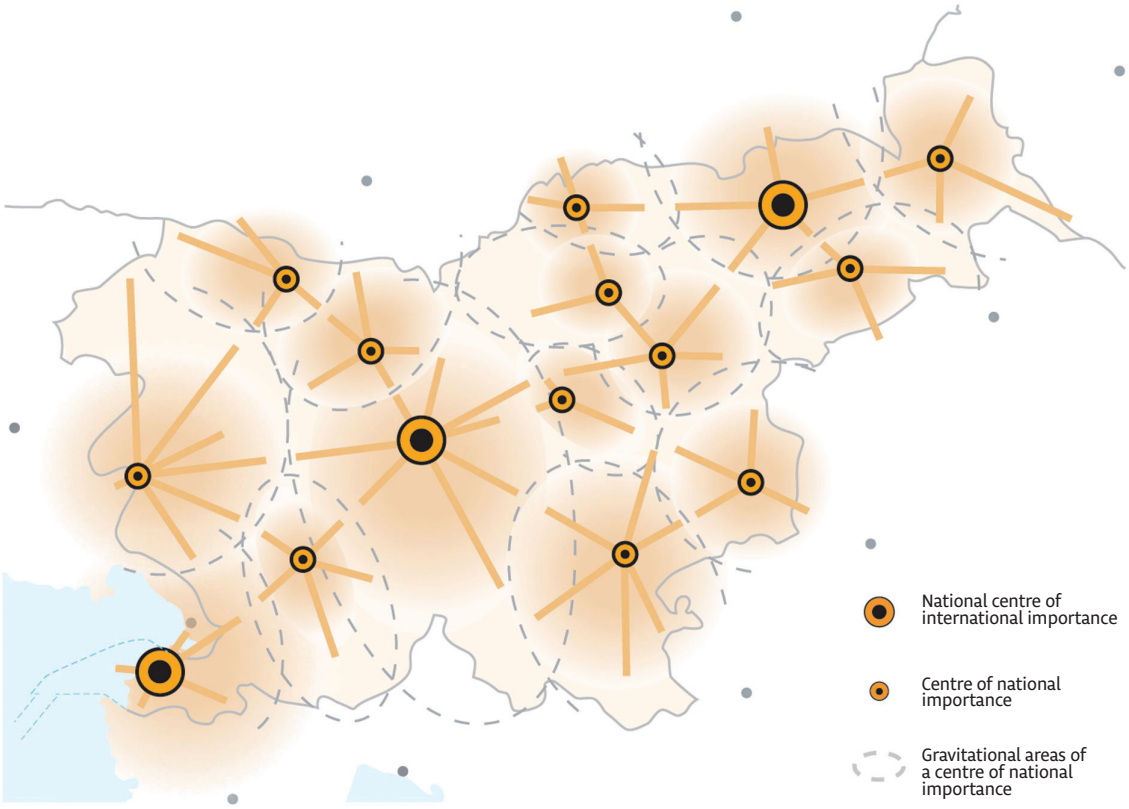
The dispersed development of low-density settlements on the fringes of cities is closely connected with patterns of daily migration based on car-dependence, thus creating higher emissions of substances and noise into the environment and causing greater dependence on energy resources. From the aspect of increasing energy prices, ensuring efficient public transport in compact urban areas will be a great advantage and savings in the future.

The increasing traffic flows in road transport are continuing, and are the result of suburbanisation and the distribution of jobs. Additional journeys and traffic flows are also caused by movements of services, trade and business activities to urban fringes. Motorway construction, which enabled better mobility in Slovenia, thus also significantly increased the daily mobility of the workforce, students and pupils and affected the construction of housing, since this is more common along motorways, especially along the Primorska and Dolenjska motorway sections.

Figure 4.
Urban centres of national and international importance with gravitational areas

Source: MzI, SPSS, Official Gazette of the Republic of Slovenia, No. 76/04.

The maritime border between the Republic of Slovenia and the Republic of Croatia is assumed as per the Treaty on the common state border between the Republic of Slovenia and the Republic of Croatia (Appendix 1), confirmed by both governments on 19 July 2001, and initialled by the heads of negotiation teams

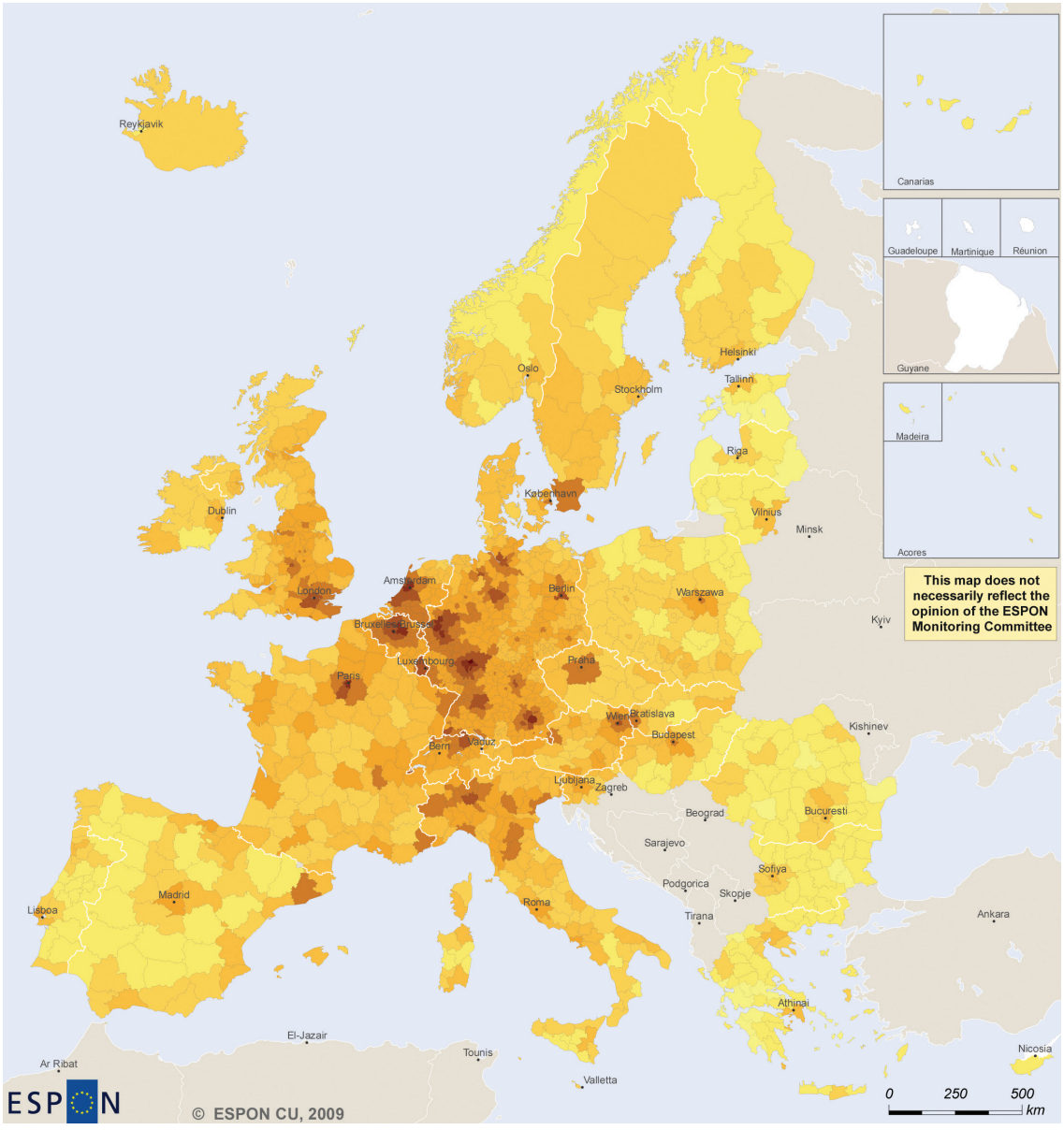


Transport within the country is based on the use of passenger vehicles; public passenger transport is underdeveloped and inefficient. The inefficiency of public passenger transport arises from the poor level of organisation and also from settlement structure, which, with numerous small and scattered settlements, makes organising public passenger transport problematic. The foregoing means that the improvement of public passenger transport cannot be tackled in the same way throughout the country, but requires various measures. Issues related to the absence of infrastructure for sustainable mobility – a network of cycling routes (within and between settlements), pavements, bus stations, public passenger transport lanes etc. – must also be highlighted.

2.4.2 Accessibility and interconnection of transport systems

Physical integration into the wider area and accessibility are essential for developing all types of connections, including business, trade and leisure connections. In economic terms, regions with better accessibility are frequently more successful and competitive. Air transport accessibility is also very important. Therefore, cities and regions with major airports are characterised by high multi-modal accessibility (Figure 5). Slovenia cannot compare with these; however, accessibility to Gorenjska and the central Slovenian region is much better than to other regions due to the public airport engaged in international air transport. Since Slovenia cannot boast high accessibility by rail, connections via Ljubljana Jože Pučnik Airport play an important role for the good accessibility of the whole country.

Figure 5.
Potential accessibility, multimodal (2006, EU27 = 100)



Regional level: NUTS 3

Origin of data: ESPON Accesibility update, 2009

Sources: RRG GIS ATABASE,S&W Flight Network,
S&W Accessibility Model

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From the international viewpoint, accessibility by a combination of public transport modes (e.g. plane/bus or train), which is quite insufficient or non-existent in Slovenia, is very important for accessibility to other centres (which do not have public international airports).

Figure 6.
City network contactibility by rail and/or air, 2009

Source: ESPON FOCI, 2010.

Regioman level: MEGa

Source: FOCI project, 2010

Origin of data: air: OAG database, rai: Deutsche Bahn website, 2009

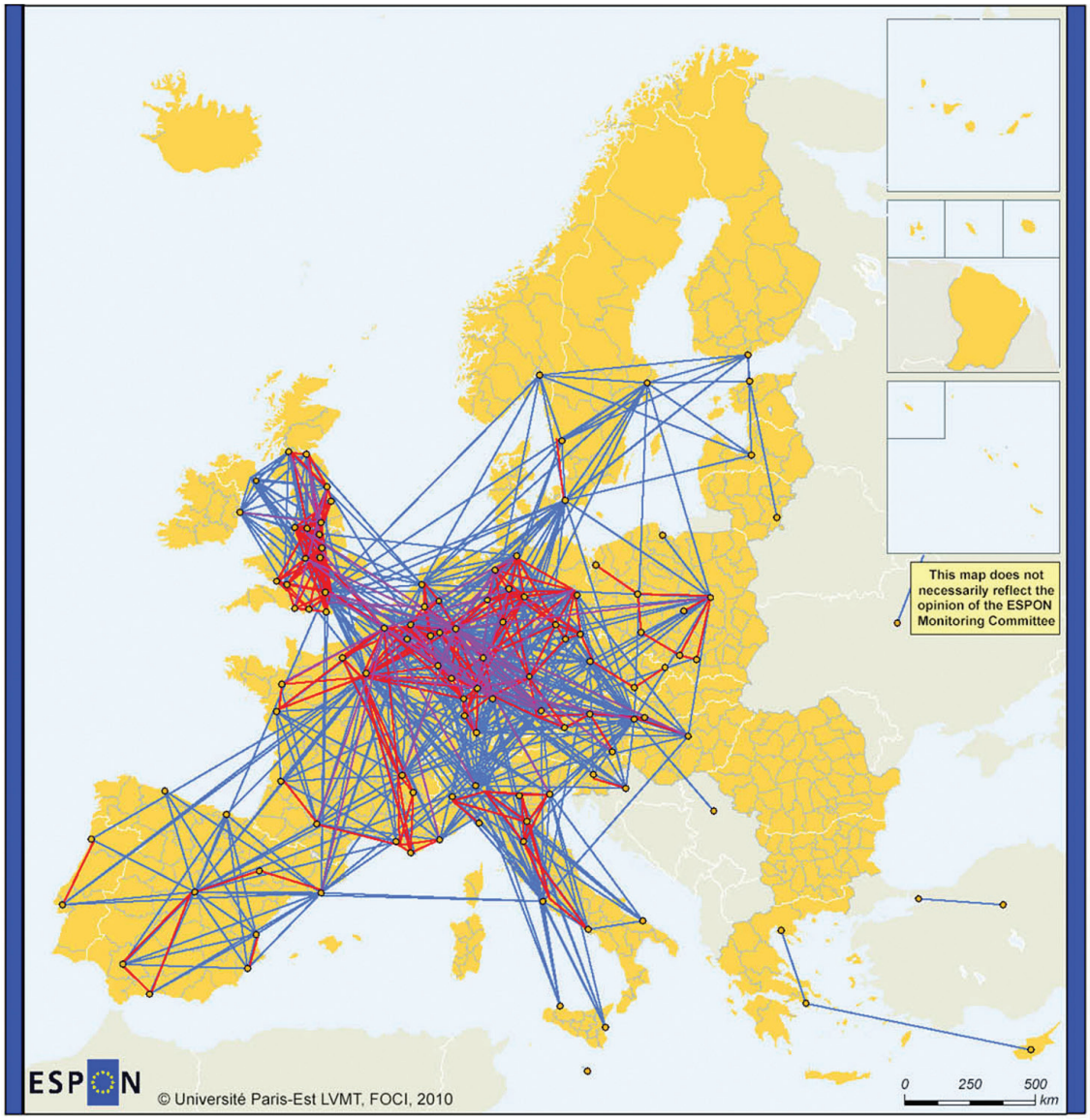

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Figure 6 shows the possibilities of one-day business trips, where the passenger has six hours at their disposal after reaching their destination if they depart at 5 am and arrive home before 11 pm on the same day. The figure presents return trips by train (red lines) and plane (blue lines). A one-day return business trip by train from Ljubljana as the only metropolitan area in Slovenia is possible only to Zagreb, Graz and Villach; such connections are available by plane to Vienna, Munich, Frankfurt and Brussels.

Slovenia's poor rail connections are of some concern, mainly because Slovenia has such a central position. Poor accessibility is the result of underinvestment in railway infrastructure. Slovenia is also insufficiently connected via air routes or rail in south-easterly directions, towards Italy and further on towards the Western Mediterranean. Regarding air transport, Slovenia has quite good connections with hubs in Central and Western Europe; the problem occurs with connections to other forms of public transport and, consequently, the accessibility of individual urban centres or regions in the country.

2.4.3 Accessibility inside Slovenia

The construction of the motorway and expressway network, in addition to good road and transport connections with neighbouring countries, has significantly improved the connections between regions and accessibility by private vehicles in Slovenia. General activities (education, health care, administration) are concentrated in major urban centres, which are divided between the centres of the highest and high levels based on their functional application. These centres are quite accessible to the majority of Slovenia's citizens (this does not apply to accessibility by public passenger transport), which is the result of good development of centres with such functions, in addition to a developed road network and the high level of motorisation. Poorer accessibility is noted mostly in less densely populated areas, such as Posočje, Cerkljansko, Kočevsko and Bela Krajina regions.

Although travel time (or distance) on a motorway or expressway is an important factor, access time to the nearest connection to a motorway or expressway is also very important. The latter 'opens' the countryside to the wider territory of Slovenia, and also the labour market, education, shopping etc.

Modernising the roads in the direction of transport axes would improve the accessibility of the above-mentioned areas, as well as improving railway connections. Alternative means of access should also be considered, especially regarding access to health-care services (hospitals), secondary school education and shopping centres. The problems of accessing activities of general importance must be additionally highlighted from the standpoint of social exclusion of vulnerable social groups, i.e. young people, the elderly or people with low incomes.

Due to geographic features, diverse transport accessibility and economic growth in individual regions in Slovenia, the differences between weak and developed areas are increasing. Despite a strategically favourable transport position, there are no modern terminals for combined goods transport. Transport supply to the economy and the connections between centres and their hinterland are also insufficient.

More attention should be given to the construction of inter-modal passenger centres that enable passengers to make efficient and safe transitions between various means of transport.

The delayed modernisation of the rail transport network and constantly increasing road transport demand the construction of new infrastructure. The public passenger transport network in Slovenia is poorly interconnected and underdeveloped, especially with regard to intermodality and logistics. Public passenger transport comprises a decreasing share of the joint transport system, and does not facilitate fast, comfortable and cost-efficient mobility at the regional level.

The development of the railway network is also important, because it will take over the bulk of long-distance goods transport.

Figure 7.
Spatial guidelines for developing an intermodal transport network in relation to settlements

Source: MzI, SPRS, Uradni list RS, št. 76/04.

The maritime border between the Republic of Slovenia and the Republic of Croatia is assumed as per the Treaty on the common state border between the Republic of Slovenia and the Republic of Croatia (Appendix 1), confirmed by both governments on 19 July 2001, and initialled by the heads of negotiation teams

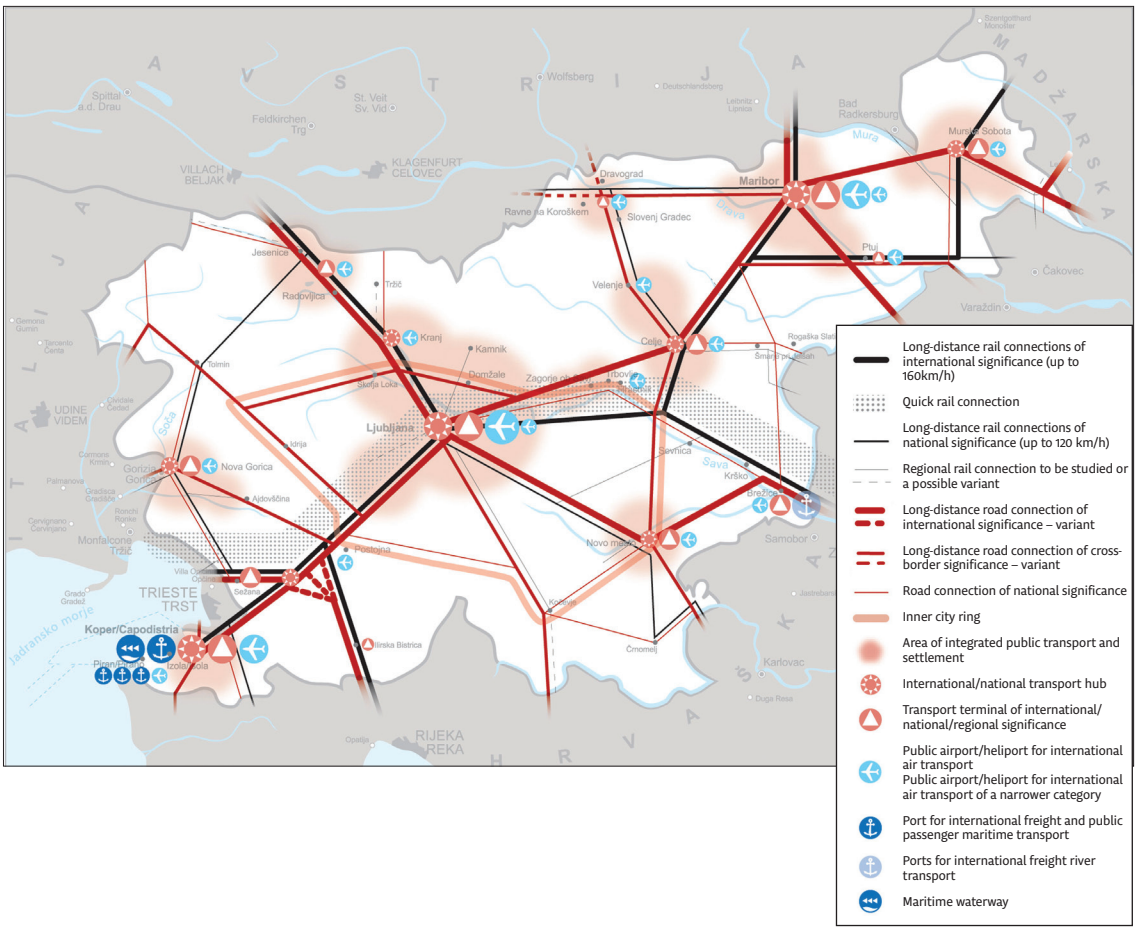
Source:
Professional bases SPRS

Cartographic bases MOPE-UPP, MOPE-GURS, GZ, 2003

Cartographic processing: MOPE, July 2004

Publication chart no. 3 to Chapter III.2.1

Development of Commercial Public Infrastructure



The development of the Port of Koper when connecting with other northern Adriatic ports and the hinterland or the Baltic-Adriatic and Mediterranean corridors is also important. An intercontinental maritime connection (passenger port) and maritime public passenger transport are significant for improving transport connections between cities in Slovenian Istria and other towns in the northern Adriatic region.

2.5 Situation analysis as per certain partial national programmes

2.5.1 State of public railway infrastructure considering the National Programme of the Slovenian Railway Infrastructure Development

The state of public railway infrastructure is worsening from year to year due to insufficient funds for its development, maintenance and modernisation. Only 25% of the National Programme of the Slovenian Railway Infrastructure Development adopted in 1995 by the National Assembly has been realised. The bad situation is also evident from the extent of the damage and number of malfunctions on tracks, the catenary, signalling and safety devices, and switches, and from low speeds, as well as from the following data on the state of individual infrastructure elements in 2010 that require urgent measures:

- major wear to tracks with a length of more than 36 km which need to be replaced;
- critical state of the catenary, whereby 40% requires full restoration, 40% requires major restoration works (worn carrying and attaching material of the catenary, poles etc.); the state of some sections is the same as in the 1930s, when they were built;
- due to the delay in the rehabilitation of tracks, some 39,000 sleepers should be replaced immediately;
- in 30 locations over a total length of 60 km, lower speeds than anticipated in timetables are necessary due to the poor condition, resulting in delays and complaints by users of railway

services, including threats of cancellations of goods transport by rail;
- 18 landslide sites and dangerous slopes along the track over a total length of over 8 km have been recorded;
- the number of unresolved decisions of the Transport Inspectorate of the Republic of Slovenia is increasing.

Insufficient maintenance and slow rehabilitation of the railway infrastructure, along with increased burdening of lines due to the increase in the amount of transport, is reflected in the greater number of decisions issued by the Transport Inspectorate limiting speed and axle loads, which is additionally affecting the quality of transport services. Thus transport services which have difficulties competing are becoming even more remote from the demands and needs of users. If the negative trends continue, it will not be possible to attain one of the fundamental goals of transport policy, since there is a serious danger that the share of rail transport will not increase. In an extreme case, this could lead to closures of individual sections of lines.

Due to inadequate permissible axle loads, individual cargos are already being redirected to routes around Slovenia, which means the loss of cargo, or even the fact that wagons are 15% lighter than their permissible load capacity in certain directions of the main Zidani Most–Šentilj and Pragersko–Murska Sobota lines (where the axle load of D4 is currently being reconstructed). On the mentioned sections of the main lines of public railway infrastructure, permissible axle loads are lower than the national axle load determined within the international framework of public railway infrastructure, i.e. D3, which has a bearing capacity of 225 kN/axle and 72 kN/m.

Little of the public railway infrastructure is electrified: only some 500 km. Currently, the Pragersko–Hodoš line is being electrified over a length of 109 km.

Due to the fact that the main priority is traffic safety, which, given the current condition of the infrastructure, can be provided only by reducing speeds – by introducing slow driving – delays in rail traffic are becoming longer.

In 2009, average delays of passenger trains were 2.8 minutes per 100 train kilometres, while in the same period in 2010, delays were 2.7 minutes per 100 train kilometres. Travel speed somewhat decreased from 51.6 to 51.3 km/h. The situation in goods transport is critical. In 2009, the average delay was 39.6 minutes per 100 train kilometres; in 2010, the average delay was 78.8 minutes, while speeds dropped from 28.8 km/h to 24.4 km/h.

The state of the public railway infrastructure and, consequently, goods and passenger transport in general is alarming:
- the results of insufficient investment in restoring and developing public railway infrastructure in the past 15 years are clear;
- the network of main lines has been more than 75% amortised, regional lines to an even higher extent;
- every year, the public railway infrastructure network is less competitive with the networks of northern and western neighbours;
- insufficient investment in rolling stock (reconstruction and purchase of new vehicles);
- the motorisation of Slovenians is at the point where, statistically, every citizen with a driving licence owns a private car (non-implementation of transport policy);
- the vignette system encourages private rather than public passenger transport (inappropriate implementation of transport policy);
- we are far from having an efficiently integrated public passenger transport (too slow implementation of transport policy).

The National Programme of the Slovenian Railway Infrastructure Development (NPRSZI) was adopted for the field of railway infrastructure (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 13–609/96).

Article 13 of the Railway Transport Act (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 11/11 – official consolidated text and 63/13) states:

- The objectives and tasks of the Railway Transport Development Strategy, investments in public railway infrastructure and the maintenance of public railway infrastructure, shall be specifically determined in the National Programme of the Slovenian Railway Infrastructure Development (hereinafter: National Programme) which is passed by the National Assembly of the Republic of Slovenia upon the proposal of the Government for a minimum period of five years.
- Regarding investments in public railway infrastructure and its maintenance, the National Programme specifically defines the order of priority investments in public railway infrastructure and the maintenance of infrastructure, the sources of finance for their realisation and the dynamics as well as the scope of realising individual tasks in the planned period. The determination of priority tasks must be based on transport policy and developmental goals by considering objective transport, technical, economic, financial and environment protection criteria.
- Based on the National Programme and upon the Ministry's proposal, the Government adopts an annual investment plan (examines the applicability of legal provision) for public railway infrastructure and an annual (not harmonised with EU directives) maintenance plan (examine the suitability of the use of exchange terms related to maintenance; reconstruction, upgrade and new construction) of public railway infrastructure for a calendar year. The Government reports to the National Assembly of the Republic of Slovenia on the realisation of the annual plan after the expiry of the period for which the plan was adopted.

The proposals for new railway stops are examined and their realisation ensured. The existing stops are maintained and modernised. Railway stations and stops should be transformed into modern passenger terminals at locations where passengers change transport modes and where there are greater traffic flows, thus enabling them to change their transport modes (rail – road – cycle – airport – port).

2.5.2 National programmes for roads

Four industry-related resolutions were adopted in the past 16 years in the field of transport structure in the Republic of Slovenia:

The Resolution on the National Motorway Construction Programme in the Republic of Slovenia (ReNPIA) (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 50/04) was adopted for the field of road infrastructure. Despite the fact that, based on the preliminary provisions of the Roads Act, the Resolution formally ceased to apply on 1 April 2011, its content is still being implemented without limitations until the new programme document is adopted, which will regulate the development of the motorway network if this is not contrary to the Roads Act or the Motorway Company in the Republic of Slovenia Act (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 97/10 and 40/12 – ZUJF; ZDARS-1). The primary provisions of the ZDARS-1 on investing in the National Motorway Construction Programme (NPIA) are thus considered, and other provisions of the ReNPIA (especially the scope of investments) remain in use.

In relation to the national programmes, it should be mentioned that they have been realised to a great extent. As will be presented in the continuation, the success rate of the realisation of national motorway construction programmes has a key impact on transport flows in Slovenia.

The total length of state roads is 5,955 kilometres. The managing company must provide their maintenance, so that all users of roads can safely use them by considering traffic rules and weather conditions. Since most of the state roads have been built, the utmost concern must be dedicated to maintaining and reconstructing its network.

There is no national programme for state roads. Expert bases were drafted for the preparation of a programme which contained investments and the maintenance of existing infrastructure, but the programme was never adopted. The state road network is growing older, so the costs of its maintenance and reconstruction are also increasing. The maintenance and reconstruction system should be established in such a way that annual investments in infrastructure exceed the actual annual wear on infrastructure.

Many state road connections can become developmental traffic routes with minimum investments, and these would suffice for the needs of transport and at the same time enable the development of individual regions.

2.5.3 National Maritime Development Programme of the Republic of Slovenia

On the basis of Article 33 of the Maritime Code (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 120/06 – official consolidated text, 88/10 and 59/11), the National Assembly adopted the Resolution on the National Maritime Development Programme (ReNPRP) at its session on 26 October 2010. Article 33 of the Maritime Code stipulates that the guidelines for sustainable maritime development and for ensuring the safety of maritime transport are determined by the National Maritime Development Programme of the Republic of Slovenia. The National Programme is a strategic document that determines the state, objectives and measures for ensuring sustainable and comprehensive development, especially in the field of maritime transport safety and maritime commerce.

Below, we focus particularly on sections from the Resolution on the National Maritime Development Programme of the Republic of Slovenia (ReNPRP), which form the basis for implementing measures of the maritime strategy.

The Port of Koper is integrated into the trans-European transport network (TEN-T) as one of the key entry and exit ports of the comprehensive European network. Stimulating the development of maritime infrastructure is a key element in establishing trans-European multi-modal networks that ensure the undisturbed operations of the internal market and the strengthening of economic and social cohesion. In this sense, Slovenia will support activities for the development of the motorways of the sea, which comprise the maritime dimension of the trans-European transport network. Slovenia will promote short-distance maritime transport mostly by supporting measures that contribute to eliminating administrative obstacles and unify administrative procedures, ensuring the greater efficiency of ports and overcoming obstacles to connecting supply chains and to unburdening the road network through the use of alternative transport forms (waterborne transport, railway).

Within the scope of stimulating the development of motorways of the sea and short sea shipping, and in addition to the development of port and hinterland infrastructure, the appropriate infrastructure and equipment for ensuring the safety and monitoring of maritime transport will have to be provided, as well as other activities such as: process, procedures and human factors optimisation; development of IT and communication technological platforms and IT systems combined with transport management systems and electronic reporting; implementation of hydrographic and mapping services; investments in the development of maritime-related education; the development of maritime clusters and stimulating the development of economic activities in the field of shipbuilding and ship component production.

All national maritime policies and development strategies in the future will focus on ensuring sustainable and comprehensive maritime management in accordance with the principles of the Integrated Maritime Policy for the EU.

In 2008, the Government of the Republic of Slovenia adopted the Decree on the administration of the freight port of Koper, port operations, and on granting a concession for the administration, management, development and regular maintenance of its infrastructure (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 71/08, 32/11, 53/13 and 25/14; hereinafter: Decree). In 2008, the Republic of Slovenia (concession provider) and Luka Koper d.d. (concessionaire) signed the Concession Contract for performing port operations, and the management, development and regular maintenance of port infrastructure on the territory of the freight port of Koper for 35 years (hereinafter: Concession Contract). In 2011, the Government of the Republic of Slovenia adopted the National spatial plan for the comprehensive arrangement of the freight port of Koper, which requires the further expansion of port capacities and the development of activities.

In the field of maritime infrastructure development at the Port of Koper, approximately one third of the existing port infrastructure has been further developed in the past twenty years. The most important investments include the additional construction of berth 7C at the container terminal and the extension of berths at the terminal for chemicals on Pier 1, the extension of the southern wharf of Pier 2 (berth 11) and the extension of the operational wharf on TRT on the northern side of Pier 2, and the construction of a multifunctional ramp at the front of Pool 2 etc.

Future measures related to investments in port infrastructure will mostly relate to the harmonisation of activities to ensure the realisation of the objectives of the Republic of Slovenia and the concessionaire designed in the concessionaire's business strategy, as well as in the port's development programme (as per the provisions of the Decree and the Concession Contract, the Government of the Republic of Slovenia adopts the Port of Koper development programme every five years, which it then annually monitors or supplements), which are in accordance with the adopted National spatial plan for the comprehensive arrangement of the freight port of Koper.

This refers to:

- achieving maximum transhipment via the Port of Koper: 18 million tonnes of goods were transhipped through the port in 2013; the goal of the port is to increase total transhipment by 2020 to 23.5 million tonnes;
- container transport (branch trend) and vehicle transport (specific advantage of the Port of Koper) are of strategic importance;
- transhipment of all types of goods and maintaining the multi-purpose role of the port (in favour of reducing business risks and greater cost efficiency by internal redistribution of capacities);
- systematic market management and development of offer to create greater added value;
- establishment of closer and more efficient relations (long-term partnerships) between all providers of logistical services;
- extending and modernising port infrastructure capacities, and providing for the appropriate integration of the port system in wider international infrastructural networks;
- care for sustainable development, environment protection and safety;
- use of economical, modern and innovative technologies, where information-communication support is very important, and
- cooperation between the concessionaire and the local community, including socially responsible conduct.

2.5.4 Resolution on civil aviation programme in the Republic of Slovenia to the year 2020

On the basis of Article 6 of the Aviation Act (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 81/10 – official consolidated text), the National Assembly of the Republic of Slovenia adopted the Resolution on civil aviation programme in the Republic of Slovenia to the year 2020 (ReNPRCL) (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 9/10) in 2010, which was published on 9 February 2010. Its purpose was to outline common objectives that stipulate the general development framework of civil aviation in the Republic of Slovenia by 2020. Thus giving a framework for providers of aviation services and potential investors, which is followed and supported by the state in the long term.

The foundations of the development of civil aviation were:

- safety and reducing risks in civil aviation, and
- sustainable development and competitiveness.

Among the objectives that were determined based on the analysis of the then situation of Slovenian civil aviation and which we want to attain by 2020, the main objective of the ReNPRCL is to guarantee the safety of civil aviation; other priority tasks include the development of the activity and infrastructure of civil aviation, closer connections with other industries, mostly tourism, and integration in the entire transport network of the Republic of Slovenia, thus achieving the objective and positive consequences of inter-modality.

2.5.5 Situation analysis in Slovenian air transport and forecasts

In 2013, 1,321,153 passengers arrived and departed from Ljubljana Jože Pučnik Airport, our biggest airport, which is slightly over 10% more than in 2012.

The record number of passengers travelled through this airport in 2008, i.e. almost 1,648,980. In 2011, the number of passengers continued to decrease, while the quantity of cargo rose. In 2013, an increase in the number of passengers was noted again.

Eurocontrol, the European Organisation for the Safety of Air Navigation, forecast a slight decrease in transport in 2012 for Slovenia, and another slight increase in 2013. Kontrola zračnega prometa Slovenije, d.o.o., has for several years noted a constant increase in the volume of air transport. The average growth in air transport in Europe in the past seven years has been 2%..

2.5.6 ReNPRCL measures that relate to public transport infrastructure

RThe ReNPRCL (Resolution on civil aviation programme) determined the measures to be taken to achieve its objectives. The measures referring to public transport infrastructure in air transport include:

- the construction of a new air transport control centre;
- the preparation and adoption of executive spatial acts for public airports of national significance;
- the construction of a passenger terminal at Maribor Edvard Rusjan Airport;
- the construction, modernisation and extension of airport infrastructure;
- the construction of a passenger terminal at Ljubljana Jože Pučnik Airport;
- the construction of a cargo terminal at Ljubljana Jože Pučnik Airport;
- the construction of a rail connection to Ljubljana Jože Pučnik Airport.

The measures determined by the ReNPRCL must be harmonised with measures for the implementation of regulations of the Single European Sky and in accordance with Eurocontrol's Convergence and Implementation Programme (for air navigation services system).

2.6 EU White Paper on Transport

In March 2011, the European Commission adopted the third White Paper on European transport policy, entitled "White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system". The first document on this topic was issued in 1996 with the aim of opening the market in transport services. In 2001, the Commission issued a second document primarily to change the use of the dominant mode of transport. In this document, the Commission refers to transferring to more friendly modes of transport, especially from road to rail, as well as inland waterways and maritime transport. By implementing an interim review of policy implementation in 2006, the Commission introduced the principle of co-modality, i.e. that it is necessary to optimally exploit all transport modes internally or by combining them, thus exploiting the advantages of each individual method of transport. The latest White Paper takes a step forward by connecting all modes of transport with the aim of enforcing the advantages of each one in a single European transport area. Slovenia welcomed this approach to EU transport policy, since this establishes fair competitiveness between transport modes by enabling their competitive advantages.

None of the transport policies published by the Commission since 1996 has received support from the EU Council. Therefore, all documents remained simply Commission communications, and Member States considered only their individual parts with regard to their national transport policies or interests, and not entire documents.

In the latest White Paper, the European Commission adopted a plan that encompasses incentives with the aim of building a competitive transport system that enhances mobility and eliminates obstacles in key areas. The new European transport area plan is dedicated to enhancing mobility and further interconnecting European transport networks. The key issues addressed by this document are:

- reducing the dependence of EU Member States on oil imports, and
- reducing greenhouse gas emissions.

The document further strengthens the concern for environment protection and sets the following objectives regarding the reduction of greenhouse gas emissions in general, i.e. in the field of transport:

- 20% reduction below the 2008 level by 2030, and
- at least a 70% reduction below the 2008 level by 2050.

The White Paper sets the following milestones:

1. By 2020:

- to establish a framework for the European multi-modal transport system for notification, management and payment;
- to establish modernised infrastructure for air transport management (SESAR) and completion of the Single European Sky; to establish land and waterborne transport management systems (ERTMS, ITS, SafeSeaNet, LRIT and RIS), and
- to establish the European global satellite-based navigation system (Galileo).

2. By 2030:

- to halve the use of vehicles powered by "conventional fuel" in urban transport, and to introduce logistics without CO2 emissions;
- 30% of road freight transport over 300 km should shift to other modes, such as rail or waterborne transport by 2030, and
- to comprehensively establish a functional and multi-modal core TEN-T network at the EU level and three times the length of the existing high-speed rail network.

3. By 2050:

- to remove from cities all vehicles powered by "conventional fuel";
- 50% of road freight transport over 300 km should shift to other modes, such as rail or waterborne transport (achieved with efficient and green corridors for goods transport). the majority of medium-distance passenger transport should be implemented by rail;
- to guarantee a 40% share of sustainable low-carbon fuels in air transport;
- to ensure a 40% (if possible, 50%) reduction in CO2 emissions which occur due to fuels from ship tanks in the EU in maritime transport;
- to complete the high-quality and capacity TEN-T network at the EU level and complete the European high-speed rail network with an appropriate set of information services. All airports in the core network must be connected to the rail network, i.e. with a high-speed network if possible. All key ports must be sufficiently connected to the railway goods network and, if possible, the inland waterway system;
- to reduce the number of fatal accidents to zero in the field of transport safety;
- to move towards the full application of "user pays" and "polluter pays" principles and to engage the private sector to eliminate distortions, and
- planned measures to stimulate investments in transport infrastructure and a change in transport patterns in passenger and goods transport are focused on strengthening economic competitiveness and employment. The plan is aimed at urban and interurban transport as well as long-distance travel.

Urban transport will be based on public passenger transport by increasing the frequency of services, walking and cycling. Smaller and lighter specialised vehicles for passengers will be available in urban areas, which will be powered by alternative fuels and use new technologies. In order to attain the objectives, municipalities will draw up mobility plans. Interurban travel will be implemented mostly by bus and rail transport in addition to designed multi-modal passenger platforms. Co-modality will be typical of goods transport over these distances, and above all, the EU will develop several entry points or ports to shorten excessive land haulage by efficiently utilising river transport. Long-distance haulage and intercontinental goods transport will be implemented by airlines and maritime vessels, whereby the EU's objective is to attain the same competitive conditions at the global level by improving the efficiency of transport management. The objective of smooth transitions between modes of transport is also emphasised, such as between trains, aircraft and maritime vessels, thus increasing the efficiency of the trans-European transport network and simplifying passenger and goods transport.

The implementation of such a vision requires an efficient framework for users and operators in transport, the early use of new technologies and the development of appropriate infrastructure, which in the EU is based on the TEN-T network. To realise the vision, it will be essential to:

- eliminate obstacles to smooth operations and efficient competition in the internal market – designing a single market for transport services;
- introduce innovations and connect all stakeholders;
- plan appropriate investments and sufficient financial resources to achieve the requisite features of the network, and
- Appendix I to White Paper states the list of planned initiatives that will be prepared by the Commission to achieve the desired objective, and which constitute an action plan for implementing the new EU transport policy.

As already stated, such EU transport policy guidelines have not been confirmed by EU Member States or the EU Council with any documents (Council's resolutions or the like); however, the document is a framework for the Commission's work, so it should be considered to the maximum extent possible also in designing this national programme.

2.7 Future EU legislative framework for the trans-European transport network

In February 2009, the European Commission published a Green Paper on the future trans-European transport network (hereinafter: TEN-T network), entitled "Green Paper, TEN-T: A Policy Review – Towards a Better Integrated Trans-European Transport Network at the Service of the Common Transport Policy".

Two and a half years of discussions, consultations, conferences and the work of the TEN-T committee followed.

On 19 October 2011, the Commission presented a new Proposal for a Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network. The regulation was accompanied by a regulation on financing the TEN-T network in the following financial framework entitled Proposal for a Regulation of the European Parliament and of the Council on establishing the Connecting Europe Facility.

Both regulations were discussed according to the regular legislative procedure and were finally harmonised in 2013; on 11 December 2013, they were published in the EU Official Journal, i.e.:

- Regulation (EU) No 1315/2013 of the European Parliament and Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU (hereinafter: TEN-T Regulation), and
- Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 (hereinafter: CEF Regulation).

2.7.1 Criteria and deadlines for implementing the future TEN-T network

The TEN-T Regulation proposes two levels of network planning, i.e.:

- the comprehensive network and
- the core network.

Certain standards apply to the comprehensive and core networks which should be implemented by 2030 (for the core network) and by 2050 (for the comprehensive network).

The comprehensive TEN-T network in the Republic of Slovenia, which is supposed to be finished by 2050, includes the entire transport cross, i.e.:

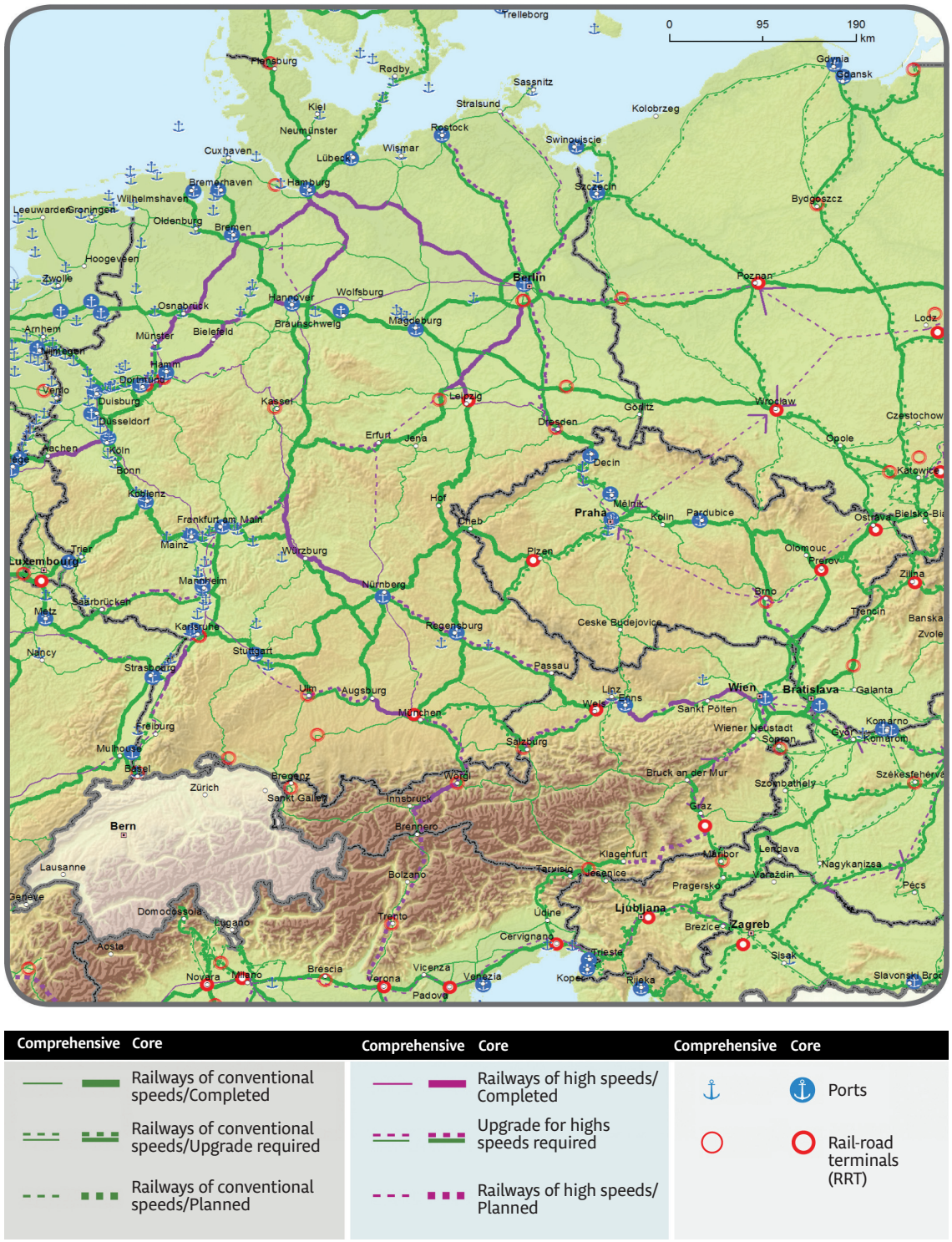
- the multimodal transport axis from Koper/Trieste–Divača–Ljubljana–Zidani Most–Pragersko to the Slovenian–Hungarian border, and through Maribor to the Slovenian–Austrian border;
- the multimodal transport axis from the Austrian–Slovenian border–Jesenice–Ljubljana–Zidani Most to the Slovenian–Croatian border.

In addition, the following are included:

- motorway or railway section from Postojna to Jelšane or the border with Croatia;
- Maribor multimodal logistics platform;
- Maribor Edvard Rusjan Airport;
- Portorož Airport;
- motorway section from Ptuj to Gruškovje or the border with Croatia.

Regarding the transport cross running across Slovenia as part of the comprehensive network, the core network, which is to be completed by 2030, failed to include only the multimodal axis from Ljubljana Jože Pučnik Airport through Jesenice to the Slovenian–Austrian border and on to Salzburg. Slovenia is also included in the core network via:

Figure 8.
Slovenian transport network in the TEN-T Regulation (railways, ports and rail-road terminals)



- Ljubljana core multimodal logistics platform;
- Koper core multimodal logistics platform;
- core Port of Koper;
- core Ljubljana Jože Pučnik Airport.

The entire TEN-T network of the EU and some other countries is presented in appendices to the Regulation:

- Appendix I contains maps of the core and comprehensive networks designed by regions and various transport modes: inland waterways, roads, rail passenger and freight connections, airports and road-rail terminals; the Slovenian transport network is shown on the map together with Austria, the Czech Republic and Germany (Figures 8 and 9);
- Appendix II contains a list of hubs, and
- Appendix III contains a map of third countries (Iceland, Norway, Switzerland, Western Balkans and Turkey).

Figure 9.
Slovenian transport network in the TEN-T Regulation (roads, ports, rail-road terminals and airports)

Comprehensive	Core	Comprehensive	Core	Comprehensive	Core
	Roads/ Completed		Ports		Airports
	Roads/ Upgrade required		Rail-road terminals (RRT)		
	Roads/Planned				

The revision clause of the Regulation, which facilitates the inclusion or exclusion of new ports, airports or road/rail terminals (RRT), if they exceed or fall below the threshold foreseen for inclusion in, or exclusion from, the comprehensive network, is new. It is also foreseen that, by 2023, the Commission will have reviewed the implementation of the core network and, if necessary, proposed modifications.

The most important standards for the comprehensive network which are to be implemented by 2050 stipulate:

1. For the field of railway infrastructure:
a. achieving standards in accordance with Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (Recast) and technical specifications in this field;
b. open access to rail terminals in accordance with Directive 2001/14/EC (Corrigendum to Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the

Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and 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) (UL L 164, 30 April 2004));
c. ERTMS implementation, and
d. electrification.

2. For the field of road infrastructure:
a. considering safety of road infrastructure in accordance with Directive 2008/96/EC of the European Parliament and of the Council of 19 November 2008 on road infrastructure safety management;
b. considering safety in tunnels in accordance with Directive 2004/54/EC of the European Parliament and of the Council of 29 April 2004 on minimum safety requirements for tunnels in the trans-European road network;
c. interoperability of tolling systems in accordance with Directive 2004/52/EC of the European Parliament and of the Council of 29 April 2004 on the interoperability of electronic road toll systems in the Community, and the Commission's Decision based on this Directive, and
d. harmonising intelligent transport systems with Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport.

3. For the field of maritime infrastructure:
a. the port should be connected to railways, roads and, if possible, to inland waterways;
b. the port has at least one terminal open (accessible) to all users under the same conditions;
c. Member States provide necessary equipment to assist ships' environmental performance in ports, especially in accordance with Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues regarding ballast water;
d. to introduce SafeSeaNet network – Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC, and
e. to provide e-maritime services, including the single window – Directive 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC.

4. For the field of air transport infrastructure:
a. each airport has at least one terminal available to all carriers in a non-discriminatory manner and that it charges transparent, appropriate and fair fees;
b. the observance of Regulation (EC) No 300/2008 of the European Parliament and of the Council of 11 March 2008 on common rules in the field of civil aviation security and repealing Regulation (EC) No 2320/2002;
c. Member States must ensure that air transport management infrastructure enables the implementation of the Single European Sky as per:
   I. Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 March 2004 laying down the framework for the creation of the single European sky (the framework Regulation);
   II. Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the single European sky (the service provision Regulation);
   III. Regulation (EC) No 551/2004 of the European Parliament and of the Council of 10 March 2004 on the organisation and use of airspace in the single European sky (the airspace Regulation), and
   IV. Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004

on the interoperability of the European Air Traffic Management network (the interoperability Regulation), as well as air transport, in order to improve the operations and longevity of the European air system and the application of the executive rules and specifications of the Union.

5. Infrastructure for multimodal transport must ensure:
e. non-discrimination;
f. the ability to move from one type of transport to another;
g. accessibility and transfer of information about cargo or passengers;
h. use of telematic applications (passengers) to simplify smooth passenger transport; appropriate equipment of cargo terminals: lifts, conveyor belts etc.

6. Infrastructure of inland waterways: not relevant for Slovenia, because there are none.

In addition to the standards for the comprehensive network, the standards for the core network as adopted by the EU Council in March 2012 and which should be implemented by 2030 determine as follows:

1. For the field of railway infrastructure:
a. electrification;
b. freight lines of the core network: at least 22.5 t of axle load, a speed of 100 km/h and the possibility of accommodating trains up to 740 m in length;
c. ERTMS implementation, and
d. track gauge of 1,435 mm.

2. For the field of road infrastructure:
a. several types of road are possible in the comprehensive network; only motorways and expressways are integrated in the core network;
b. establishment of safe and secure car parks for users, approximately every 100 km, and
c. the possibility of using alternative clean fuels.

3. For the field of maritime infrastructure:
a. the possibility of using alternative clean fuels.

4. For the field of air infrastructure:
a. the possibility of using alternative clean fuels.

The Commission may decide on variations and exceptions to the aforementioned requirements.

To make the implementation of the TEN-T network easier, the Regulation introduces core network corridors and retains the possibility of appointing European coordinators.

2.7.2 Comparison of TEN-T criteria for the core network and the actual situation of infrastructure in the Republic of Slovenia

We anticipate that railway infrastructure will require the most changes, while we believe that the standards in the field of motorways, maritime and air transport are practically ensured (minor adjustments might be required to ensure infrastructure for the use of alternative fuels).

If the above requirements for railway infrastructure are compared with the existing situation (RNE corridors C 08 and C 11 present the source), then we find the following:

	Axle pressure in tonnes	**Maximum possible speed of goods trains in km/h**	**Length of train set – in metres**	**Electrification**	**TEN-T suitability**
Koper–Divača	22.5	to 80	515	YES	NO
Trst–Divača	22.5	to 75	600	YES	NO
Divača–Ljubljana	22.5 (with limitations)	to 100	600	YES	NO
Ljubljana–Pragersko	22.5 to Zidani Most	to 100	600	YES	NO
	20 from Zidani Most to Pragersko	Some sections to 120			
Pragersko–Hungarian border*	20	to 100	600	NO	NO
		to 80 Ormož–Hodoš			
Pragersko–Maribor	22,5	do 120	590	YES	NO
Maribor–Gradec	20	do 80	560	YES	NO
Beljak–Jesenice	22,5 (with limitations)	do 100	600	YES	YES – but not in the core network
Jesenice–Ljubljana	22,5 (with limitations)	do 100	600	YES	YES – but not in the core network
Ljubljana–Dobova	22,5 (with limitations)	do 120	570	YES	NO
Pivka–Ilirska Bistrica –State border	20	do 75	530	YES	NO– but not in the TEN-T network

Table 2.3: Comparison of TEN-T criteria

Source: MzI.

* An upgrade project to guarantee TEN-T standards (speed, axle pressure, electrification) is in progress and will be concluded in 2015.

Key:
- underlined text: the parameter does not comply with the new proposal for standards for the TEN-T network;
- ERTMS/ETCS is a European system of train management and control which facilitates the interoperability of trains independently of the system of signalling and safety devices for which rolling stock is equipped, and is being introduced in Corridor D. Corridor D is the international railway corridor that overlaps with pan-European Corridor V.

2.7.3 Implementation of the TEN-T network between 2014 and 2020

The proposal of the TEN-T Regulation accompanied the proposal of the CEF Regulation (Connecting Europe Facility) that provides financial resources for the implementation of the TEN-T network in the 2014–2020 period (next financial framework). The proposal of this Regulation determines not only the amount of funds for transport, but also for energy and telecommunications infrastructure.

In the field of transport and energy, this instrument will change the current TEN financial aid. The field of telecommunications will be added later. The proposer of the Regulation believes that all three fields of infrastructure are interconnected, that they are conditions for the final unification of the European market and that they can stimulate the competitiveness of the EU economy in a time of crisis.

The financial provisions of the CEF Regulation will be discussed in a special chapter. It is important that nine core network corridors were formed as the tool for better implementation of the core network in the next 2014–2020 financial framework.

Slovenia is included in the Baltic-Adriatic Corridor with the Port of Koper and in the Mediterranean Corridor. When Croatia joined the EU, the Ljubljana–Dobova railway section also became part of the Mediterranean Corridor.

Figure 10.
Core network corridors

1 – Baltic-Adriatic Corridor
3 – Mediterranean Corridor

2.8 Analysis of competitiveness of transport corridors

Slovenia is located at the crossroads of two important transport axes, i.e. corridors X and V. Similarly, the Slovenian transport network is also designed within the comprehensive TEN-T or core EU network, with the exception of the section from Ljubljana through Jesenice towards Villach and Salzburg. For the latter section, Slovenia made every effort during the discussion of the Regulation by the EU Council and the European Parliament to make it part of the core network, but was unsuccessful. The reason for this was Austria's view that it cannot afford another major investment in the Tauern Road Tunnel (besides Brenner and Koralm) which would guarantee the standards for the core network on this route by 2030.

Nevertheless, Slovenia continues to strengthen the importance of this route by establishing the so called Western-Balkan Corridor from Munich to Istanbul, and consequently by integrating this axis with railway freight transport corridors as per Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight. Later, it will try to include it in the TEN-T core network, since a revision of this legislation is planned for 2023. The precondition is that the countries on this axis sign a letter of intent

to establish the corridor. Slovenia has already sent the proposal of a letter of intent to all countries on this axis.

Such a corridor is also supported by railway operators in all the countries integrated in this corridor.

Certain alternatives or parallel corridors also exist for the mentioned corridors. It is important to know for future decision-making about the eligibility of investments in railway infrastructure whether transport axes that cross Slovenia can maintain their competitive advantages over alternative ones or parallel transport connections.

A study was prepared for this purpose ("Advantages of transport corridors crossing Slovenia with regard to competitive corridors") whose aim was to establish the advantages or deficiencies (weaknesses) of international transport, and especially railway corridors that cross Slovenia, with regard to competitive corridors.

Three routes were selected for the comparison of competitiveness, i.e. corridors V and X, and the Bratislava–Adriatic route (ports). On all three corridors, the routes through Slovenia and alternative routes through the neighbouring country or countries were compared:

1. Corridor V:
- route through Slovenia: Venice–Ljubljana–Pragersko–Budapest–Lviv;
- route through the neighbouring country (Austria): Venice–Villach–Graz–Vienna–Bratislava–Žilina–Lviv;

2. Corridor X:
- route through Slovenia: Salzburg–Villach–Ljubljana–Zagreb–Belgrade;
- route through the neighbouring country (Austria): Salzburg–Vienna–Bratislava–Budapest–Belgrade;

3. Bratislava–Adriatic route (Adria corridor):
- route through Slovenia: Bratislava–Vienna–Graz–Maribor–Ljubljana–Koper;
- routes through neighbouring countries:
  - through Austria: Bratislava–Vienna–Graz–Villach–Trieste;
  - through Croatia: Bratislava–Botovo–Zagreb–Rijeka;
  - through Bosnia and Herzegovina: Bratislava–Budapest–Osijek–Sarajevo–Ploče.

The model transport comparison of Slovenian and competitive corridors shows the objective advantages of corridors crossing Slovenia.

The SW–NE direction (Corridor V) that runs through Slovenia is about 100 kilometres shorter than its competitors with regard to goods and passenger transport. Travel times are also 7% shorter if the Slovenian and the competitive corridor are equal in technical terms. The road and rail corridors that run through Slovenia attract more goods and passenger transport than the competitors, i.e. 4% more goods and 20% more passenger transport. This means that the route through Slovenia is more attractive, useful, efficient and suitable than the competitors. By modernising the railway corridor through Slovenia, the quantity of goods transported by railway is significantly higher than the quantity on the competitive corridor (by approximately 19% through Slovenia and 6% on the competitive corridor). Due to the shorter connection, 7% less energy is used on Corridor V, which runs through Slovenia, and there are 7% less CO2 emissions than on the competing corridor.

Corridor V is undoubtedly more favourable for goods and passenger transport from the aspect of transport, energy and air pollution than the competitor.

The NW–SE direction or railway corridor X that runs through Slovenia is also shorter than its competitor, i.e. by more than 100 km for goods transport and more than 200 km for passenger transport. Travel times are also shorter for goods transport (about 12%) and passenger transport (about 20%). The railway corridor through Slovenia also attracts 12% more freight transport due

to the shorter connection. Competitive corridor is more favourable for passenger transport, mostly because it connects big cities (Vienna, Budapest) and Bratislava (which is twice the size of Ljubljana), thus attracting 34% more passengers than those travelling through Slovenia. A modernised railway corridor through Slovenia even attracts some goods from the competitive corridor, although the latter was also reconstructed (the quantity of goods on the route through Slovenia increases by 50% and decreases by 11% on the competitive corridor). Passenger rail transport is in any case more inclined towards the competing corridor. When transporting goods through Slovenia or Corridor X, 12% less energy is consumed and air pollution is 12% lower.

Figure 11.
Corridors through Slovenia and competing corridors

A comparison with the competing corridors Adria (Bratislava–Adriatic route), i.e. oriented towards the Adriatic Sea, is not entirely feasible, because the routes cannot be compared point by point. However, we can establish that the corridor through Slovenia is in almost all respects, especially with regard to attracting transport, more favourable than the competing corridors.

Therefore, corridors V and X running through Slovenia objectively have more advantages than their competitors.

Other methods of transport in Slovenia also have competitive advantages, i.e. road, maritime and air transport. This makes both corridors multi-modal and more attractive from the aspect of competitive advantages and attracting transport. The study is relevant for the eligibility of investments in transport infrastructure, since it establishes that with reconstructed (mostly railway) infrastructure, Slovenia would attract international transport flows, thus relieving road transport, enabling the development of logistics, guaranteeing cargo and passengers to railway operators etc.

2.9 Infrastructure for the use of alternative fuels in transport

On 22 October 2014, Directive 2014/94/EU of the European Parliament and of the Council on the deployment of alternative fuels infrastructure was adopted. By using alternative fuels, Europe would reduce its dependence on the import of fossil fuels and negative impacts on the environment. By developing, investing and implementing solutions for the use of alternative fuels, research and development are being stimulated, as well as creating new jobs. In this field, Europe could take a leading role in the world. The Commission has found that the lack of infrastructure for these fuels and common technical specifications for interfaces between vehicles and infrastructure constitute a great obstacle to introducing alternative fuels in the market and their acceptance by consumers.

With the Directive, the Commission plans to ensure the construction of alternative fuels infrastructure and the introduction of common technical specifications for such infrastructure in the EU. For this purpose, the Commission proposed an obligatory coverage with minimum infrastructure for electrical energy, hydrogen and natural gas (compressed natural gas – CNG and liquefied natural gas – LNG); it is essential that consumers accept these alternative fuels (recognition in the market), thus ensuring the industry's interest in further developing and using this technology. Alternative fuels also include bio-fuels, synthetic fuels and liquefied petroleum gas (LPG).

The Directive also determined the method of informing consumers about these fuels.

The proposal of the Directive was considered in the second half of 2013 under the Lithuanian Presidency of the EU Council, and the TTE Council adopted it in December 2013. Under the Greek Presidency in the first half of 2014, the proposal of the Directive was also harmonised by the EU Council and the European Parliament. Finally, the Directive was published in the Official Journal of the European Union on 28 October 2014.

It stipulates that each EU Member State must adopt a national programme in this field, thus determining the coverage of alternative fuel infrastructure on its territory for:

- electric vehicles by 2020,
- compressed natural gas for private vehicles by 2020,
- liquefied natural gas for lorries and ships by 2025,
- hydrogen for motor vehicles by 2025,
- supplying electric energy to ships from land by 2025, and
- supplying electric energy to aircraft at airports by 2025.

3 Transport infrastructure management

3.1 Organisation of the Ministry of Infrastructure

The Ministry of Infrastructure (hereinafter: MzI) is responsible for transport in the Republic of Slovenia and is one of fourteen ministries of the Government of the Republic of Slovenia. As per the State Administration Act (hereinafter: ZDU[1]), the MzI conducts tasks involving rail, air and maritime transport, inland waters and road transport, excluding road traffic safety control, and tasks in the field of transport infrastructure and cableway installations, energy sector, mining, and efficient use of renewable energy sources. Implementing duties are performed by bodies affiliated to the Ministry, and supervisory tasks are done by inspection services.

1: State Administration Act – ZDU-1 (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 113/05 – official consolidated text, 89/07 – Constitutional Court Decision, 126/07 – ZUP-E, 48/09, 8/10 – ZUP-G, 8/12 – ZVRS-F, 21/12, 47/13, 12/14 and 90/14).

The aforementioned tasks are implemented by three directorates: the Infrastructure Directorate, the Transport Directorate and the Energy Directorate in the Minister's Office, the Internal Audit Service, the Aircraft, Rail and Maritime Accident and Incident Investigation Services, the International Affairs Service, the Financial Sector and the Secretariat.

Independent services for investigating aircraft, rail and maritime accidents and incidents are affiliated to the MzI. Accidents, serious incidents and incidents in civil aviation, in rail transport and maritime transport are investigated, and their findings are then reported in order to prevent air, rail and maritime accidents and incidents, and to reduce the risk of their occurrence in the future with the aim of improving safety in air, rail and maritime transport.

The MzI performs expert and administrative tasks that refer to the development, investments, maintenance and management of public rail and road infrastructure, and tasks that refer to the development of air transport and airport infrastructure, the maritime sector and port infrastructure. The task performed refer to:

- the transport policy of the Republic of Slovenia, including the strategy of regional development and structural policy of the Republic of Slovenia;
- monitoring and harmonising European affairs and international relations in the work areas of the Ministry, the Government of the Republic of Slovenia, EU institutions and other bodies and organisations, as well as cooperation with these bodies;
- cooperation in the preparation of materials for the Council of Ministers of Transport, the implementation of tasks of harmonising and monitoring the implementation of the EU legal order regarding transport and energy;
- harmonisation of transport connections with neighbouring countries and within the EU;
- preparation of national programmes and strategies for drawing funds from EU funds and other funds in accordance with the provisions and guidelines of the EU, and cooperation in the technical assistance project regarding administrative capacity to realise relevant programmes and strategies;
- implementation of public utility services for maintaining public transport infrastructure in rail, road, air and maritime transport, and implementation of public line bus and rail passenger transport, transport management and maintenance of railway stations;
- intermodal transport and logistics, promotion of environmentally friendly intermodal transport;
- traffic safety and promoting development and the introduction of intelligent transport systems;
- measures of sustainable mobility and European Mobility Week;
- preparation and formation of a harmonised financial plan for the Ministry and its affiliated bodies; the harmonisation and preparation of the final report of the Ministry and its affiliated bodies; the execution of the financial plan and appertaining documents of the Ministry and its affiliated bodies; supervision of the use of budgetary funds of the Ministry and its affiliated bodies; provision and management of financial operations of the Ministry and financial operations of the Inspectorate of Infrastructure of the Republic of Slovenia, and the financial

assessment of contracts concluded by the Ministry and the Inspectorate of Infrastructure;
- coordination of procedures for drawing European funds between management structures and end users of such assistance, and monitoring the implementation of projects co-financed by EU funds.

Three affiliated bodies also operate within the Ministry of Infrastructure:

1. the Slovenian Infrastructure Agency, which performs expert, technical, administrative, organisational and developmental tasks regarding state road construction, maintenance and protection, as well as traffic protection, supervision of the condition of roads, administrative tasks in the field of road tolls, management of records on state roads and other tasks stipulated by the act and executive acts governing public roads. The Slovenian Infrastructure Agency is also responsible for the expert, technical, organisational and developmental tasks relating to construction, upgrade, reconstruction and maintenance of public railway infrastructure, and other tasks determined by acts and executive acts governing public railway infrastructure;

2. the Slovenian Maritime Administration, which performs administrative and expert tasks in the fields of maritime and port infrastructure, supervision of work in ports, other areas of territorial waters and inland maritime waters; navigation safety; the conduct of maritime transport and maintenance of navigation and waterway safety facilities; inspection of the implementation of regulations on maritime transport and port infrastructure and inspection of the implementation of regulations on navigation on inland waterways;

3. the Inspectorate of Infrastructure of the Republic of Slovenia performs inspection supervision of the implementation of regulations governing road and rail transport, traffic infrastructure for all types of traffic and cable devices, including safety on ski slopes; inspection of the implementation of the provisions of regulations on road traffic, regulations issued on the basis of these provisions, regulations in relation to the work of entities that train candidates for drivers of motor vehicles and implement programmes for beginner drivers and programmes of additional training for drivers and persons accompanying exceptional transports, regulations governing the conditions for marketing motor vehicles and trailers, their registration and participation in road traffic, the conditions for performing tasks of technical services, expert and registration organisations, regulations on the conditions for transporting hazardous goods for individual types of traffic; inspection supervision of the execution of regulations and general acts on electric power and thermal energy, of movable pressure equipment and equipment under pressure in traffic and use, and of the efficient use of energy, including the tasks of inspection supervision of the implementation of the provisions of the act on mining and related regulations, technical regulations and regulations on health and safety at work, as well as other regulations on researching and exploiting mineral materials and on the implementation of other mining work.

3.2 Transport infrastructure management particularly from the view of administrative capacity to implement measures in the financial framework 2014–2020

For the field of transport, the Ministry of Infrastructure will have the role of an intermediate body, and at the same time will be the beneficiary of two thematic objectives of the EC as defined by Regulation (EU) No 1303/2013 in the 2014–2020 period, i.e. thematic objective no. 4, Supporting the shift towards a low-carbon economy in all sectors, and thematic objective no. 7, Promoting sustainable transport and removing bottlenecks in key network infrastructures. Within the scope of these two objectives, the Operational Programme for the Implementation of EU Cohesion Policy in the period 2014–2020 involves measures which

the Ministry of Infrastructure will implement in the next financial framework with EU funds and an emphasis on priority measures related to continuing the modernisation of railway infrastructure and promoting sustainable mobility, and projects focusing on eliminating poor transport capacity on road and maritime infrastructure. The MzI drafts and updates manuals for the implementation of management, financing and supervision of projects co-financed by European funds; it coordinates procedures for the use of European funds between management structures and end users of such assistance; it monitors the implementation of projects co-financed by EU funds and supervises and prepares forecasts on the utilisation of EU funds as per the rules on drawing them. The MzI receives payments from the Community contribution of the European Commission within the scope of the centralised management of approved European funds, and keeps appropriate interest sub-accounts; it also implements the tasks of a control unit for drawing European funds within the scope of administrative on-site control and prepares relevant records and reports.

The fields of transport policy implemented by cohesion policy resources in the 2014–2020 period are determined in the Partnership Agreement between the Republic of Slovenia and the European Commission for the 2014–2020 period and the Operational Programme for the Implementation of EU Cohesion Policy in the period 2014–2020.

Measures to be implemented on the priority axis of constructing infrastructure and measures to promote sustainable mobility include:

- development of an integrated, high-quality and interoperable rail system;
- improvement of regional mobility by connecting secondary and tertiary transport hubs of state roads with TEN-T infrastructure;
- support for the multi-modal Single European Transport Area by investing in the TEN-T network, which anticipates the elimination of obstacles to transport capacity of motorways and maritime routes.

The cohesion policy resources in the 2014–2020 period were reduced significantly, and the number of major measures is also being reduced. More funds are ensured for the priority axis involving sustainable consumption, the production of energy and smart grids, and more measures for promoting sustainable mobility are also anticipated.

In comparison with the current financial framework, the reduction of available funds is typical for all fields of transport, especially regarding the construction of motorway sections and state road sections, as well as for railway infrastructure, which nevertheless remains the first priority.

Technical aid within the scope of the Cohesion Fund will also be available to strengthen the administrative capacities of bodies, whereby the key measure of success will be the transfer of know-how and the employee structure in the new 2014–2020 programming period. In cooperation with the managing body, the MzI will dedicate special attention to strengthening the administrative capacities of bodies included in the implementation of European cohesion policy and the beneficiaries of these funds by implementing training and transferring know-how among employees.

Consequently, the key tasks of the MzI in relation to guaranteeing suitable administrative qualifications for the implementation of the 2014–2020 cohesion policy will be:

- to retain qualified human resources who implement procedures for the current financial framework to also implement the tasks of the next programming period;
- to identify the needs for additional hiring or re-positioning of existing qualified human resources as per the changes in priority areas and the amount of allocated funds;
- to additionally educate and train human resources with regard to novelties and best practices of implementing CP 2014–2020 in all fields of work and with particular emphasis on public procurement, project management and administrative verification.

3.2.1 Railway infrastructure

Stimulating environmentally friendly modes of transport and enforcing the principles of multi-modality must take the priority in eliminating the accumulated structural weaknesses in the infrastructure development, primarily in the field of railway infrastructure. Slovenia follows the requirements of European transport policy for establishing a trans-European network. In the past, development focused mainly on improving the motorway traffic network, while other areas lagged behind in development. This led to a standstill, especially in the field of railway infrastructure, due to the lack of funds for investment in the national budget and the lack of other necessary sources of investment financing. The standstill occurred in spite of the investment of significant funds in the modernisation of railways in recent years (projects: modernisation of the existing Divača–Koper line, modernisation and electrification of the Pragersko–Hodoš line, arrangement of level crossings, GSM-R and ERTMS project).

The vision of the European Union is to enable non-discriminatory access to railway infrastructure and its use in individual countries to various national or foreign carriers implementing services of goods transport, and since 2010 also the services of international passenger transport. Such an approach ensures greater competitiveness in the transport sector of the European Union, and the expectation that the quality of transport services will also increase while observing sustainable development, efficient use of energy and highlighted traffic safety.

On the basis of Regulation (EU) No 1315/2013[2] on the development of the trans-European transport network for competitive rail transport, the Republic of Slovenia is committed to cooperating with other countries on individual corridors to establish two corridors, i.e.:

- Mediterranean Corridor:
  Almeria–Valencia/Madrid–Zaragoza/Barcelona–Marseilles–Lyon–Turin–Milan–Verona–Padova/Venice–Trieste/Koper–Ljubljana–Budapest–Zahony (Hungarian–Ukrainian border);
- Baltic–Adriatic Corridor (previously RFC 5): Gdynia–Katowice–Ostrava/Žilina– Bratislava/Vienna Klagenfurt–Udine–Venice/Trieste/Bologna/Ravenna/Graz–Maribor–Ljubljana–Koper.

2: REGULATION (EU) No 1315/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU, OJ L 348/1

Since its independence in 1991 and until 2014, public railway infrastructure in the Republic of Slovenia has not changed significantly, since its key technical characteristics have not changed very much. A new Puconci–Hodoš (state border with Hungary) was constructed, which enables a direct connection to the Hungarian railway network. Furthermore, regular and investment maintenance works were being implemented, including minor investments. Major upgrading is currently underway on the Pragersko–Hodoš and Divača–Koper lines, and on several sections of the Celje–Maribor line.

Since 2003, Slovenia has been arranging the management of public railway infrastructure as per the amendments to the EU legislation, EC procedures, recommendations of supervisory authorities and implementation needs. The tasks and powers were divided between several authorities and were transferred several times: to the Public Agency of the Republic of Slovenia for Railway Transport in 2003, then to the Agency for the Management of Public Railway Infrastructure Investment, to the ministry responsible for transport and to the Slovenian Infrastructure Agency in 2015. The organisational composition and role of individual authorities when managing public railway infrastructure arise from the Government of the Republic of Slovenia Act (hereinafter: ZVRS), the State Administration Act (hereinafter: ZDU-1), the Railway Transport Act[3] (hereinafter: ZZelP) and the Railway Traffic Safety Act[4] (hereinafter: ZVZelP).

3: Railway Traffic Safety Act (ZVZelP-UPB3) (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 56/13 – official consolidated text and 63/2013)

4: Railway Traffic Safety Act (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 56/13 – official consolidated text and 91/13).

Overview of the transfer of tasks and powers

The 2003–2008 period

Since its establishment in 2003 and until 2008, the Public Agency of the Republic of Slovenia for Railway Transport (hereinafter: AŽP) was responsible for:

- preparing, organising and managing investment works on public railway infrastructure;
- managing PRI and assets allocated to AŽP for management by the Government of the Republic of Slovenia, and
- concluding contracts for implementing the public utility service of transporting passengers in internal rail transport, rail transport management on PRI and PRI maintenance in the name of, and on the behalf of, the state.

The 2008–2010 period

With the establishment of the Agency for the Management of Public Railway Infrastructure Investment in 2008, the tasks of preparing, organising and managing investments were transferred to the public railway infrastructure in all phases of the investment procedure, organisation and implementation of project documentation reviewing, preparation of contracts and supervision of the implementation of contracts on public utility services for rail transport, public railway infrastructure management and management of railway station buildings.

The 2010–2015 period

With the abolition of the Agency for the Management of Public Railway Infrastructure Investment in 2010, most tasks were transferred directly to the ministry responsible for transport, and to the new Slovenian Infrastructure Agency as of 1 January 2015.

Public railway infrastructure management

The organisation of management, maintenance and investment in public railway infrastructure (hereinafter: PRI) is laid down in Slovenian legislation and that of the EU. The public railway infrastructure consists of structures and devices necessary for smooth public rail transport, and appertaining land which functionally serves its dedicated use. Investing in PRI denotes the construction of new PRI and upgrading of the existing infrastructure in order to improve its transport, technical and safety characteristics. PRI is a constructed national asset owned by the Republic of Slovenia. The tasks of managing public railway infrastructure are implemented by the PRI manager based on the contract concluded with the Government of the Republic of Slovenia. The manager's tasks are implemented by the company, SŽ – Infrastruktura, d.o.o. (hereinafter: SŽ Infrastruktura).

The powers are divided between several entities: the ministry responsible for infrastructure, the Slovenian Infrastructure Agency, DRI upravljanje investicij, Družba za razvoj infrastrukture, d.o.o., AŽP and SŽ Infrastruktura.

Tasks and powers of individual entities managing PRI

SŽ Infrastruktura

SŽ Infrastruktura conducts the tasks of the public rail infrastructure operator and publishes the Network Statement of the Republic of Slovenia, which is drafted in accordance with the ZelP, the Decree on the allocation of train paths and user fees for the use of public railway infrastructure and directives of the EU. Maintenance of PRI and rail transport management constitute a mandatory public utility service.

Maintenance of PRI particularly includes the implementation or organisation of:

- maintenance works that preserve normal operational capacity and ensure traffic safety; regular maintenance works also include the replacement of components replaced during preventive and corrective maintenance with elements with identical functions and operations, as well as the supervision of sub-systems, ensuring the establishment of the trafficability of lines in the event of natural and other accidents, managing registers and records and the implementation of measurements of individual parameters or parts of the system, and
- rehabilitation of railway infrastructure.

Management of PRI encompasses:

- preparation of the proposed maintenance plan for the existing public railway infrastructure;
- preparation of expert bases for new developmental projects of railway infrastructure;
- conclusion of legal transactions connected with the public railway infrastructure management and station facilities in the extent and when these are not used or not necessary to meet their primary purpose.

The operator also conducts the following tasks:

- supervision of investment works for the purpose of ensuring the safety of rail traffic;
- the issue of consents for interventions in the railway and protective railway line as per the act governing the safety of railway transport;
- preparation and publication of the network statement;
- management of railway station facilities.

The company, SŽ Infrastruktura, monitors the condition of PRI in the Republic of Slovenia. Its data are published in the annual network statements. Since independence in 1991 and until 2014, PRI in the Republic of Slovenia did not change significantly because its key technical characteristics did not change very much. The new Puconci–Hodoš line (state border with Hungary) was constructed, which enables a direct connection to the Hungarian railway network. Furthermore, regular and investment maintenance works were being implemented, including minor investments. Major upgrading is currently underway on the Pragersko–Hodoš and Divača–Koper lines, and on several sections of the Celje–Pragersko line.

The Decree on the categorisation of railway lines classifies lines according to the maximum permitted line speed to high-speed lines and conventional lines. The Decree also stipulates that all lines in the Republic of Slovenia are conventional lines.

Slovenian Infrastructure Agency

As per the Decree on bodies affiliated to ministries[5], the Slovenian Infrastructure Agency (hereinafter: DRSI) conducts expert, technical, organisational and developmental tasks relating to the construction, upgrade, reconstruction and maintenance of public railway infrastructure, and other tasks determined by acts and executive acts governing public railway infrastructure.

The DRSI is responsible for implementing policies relating to transport and railways, and the preparation of substantive groundwork for conducting tasks in the field of rail transport and transport infrastructure:

- preparation of the national programme of PRI development;
- preparation of regulations and international agreements;
- preparation, organisation and management of investment (projects) in PRI;
- preparation of the annual maintenance plan and the plan of investment in PRI;
- organisation and implementation of reviews of project documentation;
- conclusion and supervision of implementing contracts of the public utility service for PRI maintenance, and PRI and rail transport management.

5: Decree on bodies affiliated to ministries (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 58/03, 45/04, 86/04 – ZVOP-1, 138/04, 52/05, 82/05, 17/06, 76/06, 132/06, 41/07, 64/08 – ZViS-F, 63/09, 69/10, 40/11, 98/11, 17/12, 23/12, 82/12, 109/12, 24/13, 36/13, 51/13, 43/14 and 91/14).

Public Agency of the Republic of Slovenia for Railway Transport

The Public Agency of the Republic of Slovenia for Railway Transport (AŽP) implements the tasks of a security authority. It provides the legal framework and conducts formal procedures to ensure safety in rail transport, including duties of the allocating authority (provision of a non-discriminatory access to PRI to applicants or carriers) and tasks related to the use of technical specifications for interoperability.

As the national security authority, the AŽP:

- issues licences and safety authorisations;
- issues safety certificates;
- issues operating permits;
- monitors the development of the security regulatory framework, including the system of Slovenian regulations.

DRI upravljanje investicij, d.o.o.

The company, DRI, upravljanje investicij, d. o. o., was established on the basis of Article 13a of the ZZelP[6]. It supervises the construction or reconstruction of railway lines, implements procedures for obtaining land for new lines, drafts variant studies and implements engineering operations regarding spatial plans.

6: Railway Transport Act - ZZelP (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 11/11

Relations with the ministry responsible for infrastructure are regulated on the basis of the so-called in-house contract, concluded for an indefinite period, no. 2411-11-100031 (of 24 June 2011). The contract anticipates that the DRI will conduct the services of investment management in PRI as per the following tasks:

- integration of transport infrastructure in the environment and acquisition of land and other real estate for construction;
- drafting investment, project and other documentation for construction of PRI;
- construction of PRI, and
- other tasks necessary for the completion of investments in PRI.

DRI upravljanje investicij, d.o.o. thus operates as the state's internal operator, whereby the state supervises its work. The company is in 100% state ownership. The major part of tasks regarding roads and railways is implemented according to the in-house system of a state's internal operator. The contracting authority, the Republic of Slovenia, supervises its work and issues instructions on the implementation of relevant tasks. The investments managed by the DRI are determined in the National Programme of the Railway Infrastructure Development (NPRJŽI RS), the annual investment plan for PRI (LNI) and investment programmes (IP).

In accordance with the Act Amending the Railway Transport Act[7] the Railway Sector of the Slovenian Infrastructure Agency implements projects connected to upgrading. The relevant Act[8] defines upgrading as a change in a railway subsystem or part of a subsystem that improves the entire operation of the subsystem. All proposed projects incorporated in the Operational Programme of the Republic of Slovenia for the period 2014–2020 as per the ZZeIP-H[9] are considered upgrading, thus making the Slovenian Infrastructure Agency a beneficiary.

7: Act Amending the Railway Transport Act - ZZeIP-H (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 92/99.

8:Act Amending the Railway Transport Act - ZZeIP-H (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 92/99.

9: Railway Transport Act - ZZelP (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 92/99.

It would be suitable for long-term development planning and the best possible management of public railway infrastructure for tasks to be allocated more clearly, and for the tasks of management and maintenance to be divided, including tasks relating to investments (upgrading, new construction).

A long-term public railway infrastructure development programme with a multi-annual contract, the provision of sufficient funds and measurable objectives would also contribute to this, including implementation supervision.

3.2.2 Sustainable mobility

The current situation in the field of sustainable mobility and the use of public passenger transport (PPT) in Slovenia is bad; therefore, the implementation of measures for sustainable mobility in the 2014–2020 period remains one of the main priorities of the Ministry of Infrastructure. By introducing sustainable mobility at all levels, we want to significantly contribute to reducing the negative effects of transport on the environment, thereby improving the quality of living space in urban areas and traffic safety, and increasing the mobility of citizens in remote areas.

Slovenia's activities in the field of sustainable mobility are implemented for the purpose of ensuring access by public transport or by ensuring conditions for sustainable mobility, which includes walking and cycling.

To improve public passenger transport, the development of comprehensive sustainable and accessible mobility in cities will be established, and advanced technologies for efficiently monitoring and managing public passenger transport will be introduced. Synergies with the construction of infrastructure will be ensured by selecting those projects/measures that have the maximum synergy effects in terms of pollution indicators (air) and mobility indicators (passenger kilometres). Along with appropriate infrastructural conditions for the operation of integrated public passenger transport, it will be necessary to approach comprehensive solutions with the aid of guidelines for the implementation of comprehensive transport strategies.

Measures proposed by the MzI for implementation with available EU funds (CF and EFRD) will be prepared and managed within the scope of the MzI by establishing a project unit for sustainable mobility with qualified staff who already perform tasks in the relevant field in the current financial framework, within which important bases for the further development of this area have been established. Considering the fact that activities in the future financial framework will be additionally expanded and intensified in comparison with the current financial framework, appropriate additional HR will be required to establish suitable administrative qualifications to manage procedures in the implementation of projects. Considering the planned activities, the Ministry will have to review the needs for additional HR, which will be ensured within the scope of the 2014–2020 technical aid project. The priority is to maintain qualified staff who have worked in the field of sustainable mobility within the scope of the 2007–2013 technical aid project, and to employ the necessary human resources in the shortest possible time with the 2014–2020 technical aid funds.

The beneficiaries of funds in the field of sustainable mobility will be the Ministry of Infrastructure, local communities and private law entities. The instruments for determining beneficiaries are public calls and direct confirmation of operations.

The measures include the continuation and rational upgrading of projects already being implemented (integration of public passenger transport, park and ride projects), whereas the highest quota of funds from the Cohesion Fund and the European Regional Development Fund is purposed for sustainable mobility in the 2014–2020 period, and the range of measures is also expanding. In cases when measures to stimulate sustainable mobility are beyond the scope of transport, the 2014–2020 Cohesion Policy implementation procedures will also include associates of the Energy Directorate and their substantive contributions.

The key tasks which will be implemented by employees within the project unit for sustainable mobility in relation to 2014–2020 Cohesion Policy procedures are:

- preparation and monitoring of the implementation of sustainable mobility measures;

- preparation of applications and public calls for the acquisition of EU funds;
- cooperation on the implementation of public procurement procedures and public calls in accordance with the internal acts of the MzI in this field;
- cooperation on payment and reimbursement procedures;
- implementation of project management or contract custodian tasks (in the case of public calls) arising from national legal bases and contractual relations with participants when implementing projects;
- monitoring and reporting tasks at the project level and priority guidelines;
- reporting on irregularities at the project level, and
- cooperation in project and working groups on the preparation of instructions and other relevant material for the programming period.

3.2.3 Road infrastructure

Public roads comprise the entire public road network in the Republic of Slovenia, and are divided into state roads owned by the Republic of Slovenia and municipal roads owned by municipalities. The division was made following the example of European countries, and is based on the importance of public roads for integration and the course of traffic in a certain region. The total length of the Slovenian public road network is over 38,900 kilometres. State roads measure in total 6,454 kilometres. The management, maintenance and development of the state network – regional and main roads – are the responsibility of the Slovenian Infrastructure Agency (DRSI), and the Motorway Company of the Republic of Slovenia (DARS) is responsible for managing, maintaining and developing motorways and expressways. State roads are divided into motorways, expressways, main roads of classes 1 and 2, and regional roads of classes 1, 2 and 3. Municipal roads are roads of the public road network managed by municipalities, which also renovate and maintain them. These roads are divided according to the characterisation of municipal roads adopted by municipalities. Municipal roads include local roads (over 13,860 kilometres) and public paths (over 18,500 kilometres).

Družba za avtoceste v RS, d.d.

As per the Motorway Company in the Republic of Slovenia Act[10], the Motorway Company of the Republic of Slovenia (DARS) manages and maintains the motorway and expressway network in the Republic of Slovenia, and is the beneficiary of cohesion funds.

10: Motorway Company in the Republic of Slovenia Act (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 97/10 and 40/12 – ZUJF).

According to the development programmes, DARS implements tasks relating to:
- spatial planning, integration of motorways in the environment, acquisition of land and other real estate for motorway construction;
- construction and renovation of motorways and financial construction of funds earmarked for the construction of motorways and expressways and the payment of loans, whereby mutual rights and obligations of the Republic of Slovenia and DARS are determined in an agency contract.

The motorway sections, development and renovation tasks that are to be implemented in an individual year, and the amount of funds according to individual sources of finance for construction and renovation are determined in the concession contract. As per the provisions of the Public Roads Act and regulations issued on its basis, the company as part of its public authorisation also realises the tasks of supervising the condition of roads and traffic arrangements, counting of traffic, organising the dissemination of information on the condition of roads and traffic, prohibiting or limiting traffic, issuing various consents or permits regarding construction, laying of various ducts and devices in the protection strip along motorways, issuing permits for exceptional transport, permits for partial or complete closure of motorways, permits for installing tourist or other informative signalisation along motorways etc.

The mutual rights and obligations of the Republic of Slovenia and DARS relating to management and maintenance tasks are determined in the concession contract and are being realised as a public utility service.

One motorway section construction project has been proposed for construction by means of cohesion policy funds in the 2014–2020 period, i.e. the section that has been constructed in the current financial framework and provides a direct connection to a neighbouring Member State. Considering the amount of funds earmarked for this purpose in the current framework, the quota in the 2014–2020 period is significantly lower, mostly due to the completed construction of the motorway cross and the transfer of funds to new priorities i.e. railways and sustainable mobility.

Slovenian Infrastructure Agency

The Slovenian Infrastructure Agency (DRSI) is a body affiliated to the Ministry of Infrastructure. It was established in 1995 from its predecessor, the National Road Administration, from which the construction of motorways was excluded and transferred to the newly established public company owned by the Republic of Slovenia (DARS, d.d.). The Slovenian Infrastructure Agency manages main and regional roads, and also national cycling routes.

The DRSI implements professional, technical, developmental, organisational and administrative tasks for the construction, maintenance and protection of main and regional roads and some expressways, including tasks relating to the transport of goods and passenger road transport. Its tasks include the preparation of proposals for investments in state roads within its jurisdiction, and the coordination of project planning, construction and reconstruction of roads and facilities situated on these roads. The Agency collects and processes various data required for the assessment of road investment decisions and conducts tasks adopted by the National Assembly, the Government and the ministry responsible for infrastructure.

To promote sustainable transport and eliminate bottlenecks in key network infrastructures, Slovenia will invest funds in improving regional mobility by integrating secondary and tertiary transport hubs with the TEN-T network in the 2014–2020 period. These measures will be implemented by the DRSI, which is eligible for ERDF resources for projects to modernise and construct state roads. The quota of these funds is considerably smaller than in the current period; furthermore, only sections that have a direct impact on the economic development of regions in Slovenia on the third development axis are eligible for co-financing. Significantly fewer measures are planned for implementation with ERDF resources. A special office and its employees within the scope of the technical aid for 2007–2013 prepare and implement projects co-financed in the current financial framework, which has proven appropriate and a good basis for efficient work also within the scope of the 2014–2020 Cohesion Policy. Activities in relation to the implementation of projects co-financed by EU funds in the 2014–2020 period will be performed by employees who have done work already in the current framework; therefore, no major deviations are expected from the aspect of administrative qualifications.

3.2.4 Maritime infrastructure

Maritime transport includes commercial and non-commercial activities connected with the sea. Maritime commercial activities in Slovenia include shipbuilding, maritime transport, port activities and port, agency and shipping activities, piloting services and tugs, supply of ships, cleaning of the sea, banking, insurance and also nautical tourism from the viewpoint of security. Non-commercial activities include administrative, supervisory, security, educational and research activities connected to the sea.

As an activity, maritime transport is connected to the navigation at the sea and exploitation of marine resources; it is part of the history, life and economic activity of Slovenia's people. A favourable central European location has also contributed to the several hundred years' of Slovenian involvement with the sea. The favourable location in the heart of Europe is a great advantage in the efficient development of maritime activities, facilitating the shortest transport route and the southern gateway for international commerce between Europe and other countries of the Mediterranean and the Suez Canal. The effectiveness of a society's economy depends on the quality of functioning of its transport system, which has a direct effect on the acceleration or suppression of the society's development as a whole. The importance of maritime transport will further increase in Slovenia and the world due to a number of factors:

- globalisation, economic trends and the reduction of trade barriers and limitations;
- growth in the extent of trade and transport in connection with the growing demands for high-quality services (transport, logistics, multimodality);
- development of information and communication technologies;
- increase in the significance of sustainable development which observes social, environmental and cultural aspects;
- internationalisation in the labour market.

Nevertheless, all Slovenia's natural assets and advantages do not guarantee an automatic transfer of traffic flows through it. Neighbouring countries also strive to take over as much transport as possible and increase the related income. A possible loss of traffic flows would have an impact on the entire economy of Slovenia.

The importance of transport in the business sector is diverse, since various analyses show a high interdependence between the development level of transport activities and the level of economic development. Transport activity enables a reproduction process by overcoming spatial differences between production and consumption; it ensures supply to the business sector of necessary resources, and enables an expansion of labour markets, products and raw materials; provides the possibilities for the specialisation of production; it serves as the basis for reducing regional differences in the development of individual countries. Historical experience shows that rail and maritime transport have played a decisive role in accelerating international trade and thus in the development of countries and continents.

Fundamental infrastructure in maritime transport is a port, which is a junction of maritime and land transport routes. European ports in particular have always had the role of transport hubs facilitating economic growth. With their hinterland regions, they are still the basic parts of the spatial organisation of economies and social structures. Ports have become important accelerators of economic development and growth, particularly in North European continental countries, where the design of maritime industrial development areas was developed.

When assessing the economic significance of ports, a broader view is required which encompasses all port activities which are needed for the organisation and implementation of maritime transport of goods:

- shipping company services (piloting, berthing, supply etc.);
- accompanying service activities (forwarding agents, customs, insurance companies, shipping agents etc.);
- services relating to goods (transhipment, storage, sorting, packing, labelling, preparation for market etc.);
- land transport.

The modernisation of ports is one of the conditions for more qualitative and efficient integration of Slovenia in the European transport network and ensures a facilitated flow of goods, services

and passengers. The growth of cargo transit transport and natural barriers (e.g. the Alps, the Pyrenees) favour accelerating the development of maritime transport and relieving the growing road transport. The inclusion of the freight port of Koper in the project of the "motorways of the sea" contributes to improving the connectivity of countries behind the Alps, the Pyrenees and the Baltic Sea, which does not result in relieving the road transport in Slovenia. The planned rerouting of goods transport to the modern rail connection Lyon–Trieste/Koper–Ljubljana–Budapest, which will be realised in the near future, will particularly contribute to unburdening roads. The modernisation of the rail connection will also improve the functioning of the port and increase the capacities and advantages of the Port of Koper.

Maritime transport safety

In recent years, the EU and Member States have focused on improving maritime legislation on safety and the promotion of high quality standards. The purpose of these measures was to eliminate sub-standard ships, increase the safety of crews and passengers on ships, reduce the risk of polluting the environment from ships and ensure that shipping companies which comply with best practice are not in an inferior position to those wanting to avoid maritime safety.

While many flag states and shipping companies meet strict international obligations, their efforts are constantly under threat from those not working in accordance with these rules. When shipping companies break the safety rules, they endanger people, their crew and the environment, and create additional profits by unfair competition.

The EU's action regarding maritime safety and the protection of the environment contributes to the added value of the internationally recognised standards of the International Maritime Organisation (IMO). The transposition of the IMO rules in the EU's legal system ensures their implementation throughout the EU.

One billion tonnes of oil travel through EU ports. The EU is thus constantly developing and enhancing its policy on maritime safety to eliminate substandard ships.

In 2008, the Government of the Republic of Slovenia adopted the Decree on the administration of the freight port of Koper, port operations, and on granting the concession for the administration, management, development and regular maintenance of its infrastructure[11] (hereinafter: Decree). The Republic of Slovenia (concession provider) and Luka Koper d.d. (concessionaire) signed the Concession Contract for performing port operations, and the management, development and regular maintenance of port infrastructure on the territory of the freight port of Koper for a period of 35 years (hereinafter: Concession Contract). In 2011, the Government of the Republic of Slovenia adopted the National Spatial Plan for the integrated regulation of the freight port of Koper, which requires the further expansion of port capacities and development of activities.

11: Decree on the administration of the freight port of Koper, port operations, and on granting the concession for the administration, management, development and regular maintenance of its infrastructure (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 71/08, 32/11, 53/13 and 25/14).

In the field of maritime infrastructure, the main measures will focus on developing the Port of Koper, which is one of the most important strategic platforms and has a favourable geostrategic position for supplying the markets of Central and Eastern Europe. A measure enabling the further development of the port is to be implemented with the use of EU funds in the 2014–2020 period.

The MzI will be the intermediate body, which will monitor the implementation of the project. The project custodians at the MzI in the 2014–2020 period will be employees who have worked on the same tasks in the current framework; therefore, no major deviations are expected from the aspect of administrative qualifications.

The beneficiary of Cohesion Policy funds is the Slovenian Maritime Administration (URSP). As a body within the Ministry of Infrastructure, the Slovenian Maritime Administration performs administrative and expert tasks in the fields of maritime and port infrastructure, supervision of work in ports, other

areas of territorial waters and inland maritime waters; navigation safety; the conduct of maritime transport and maintenance of navigation and waterway safety facilities; inspection of the implementation of regulations on maritime transport and port infrastructure and inspection of the implementation of regulations on navigation on inland waterways.

The measure to be implemented by the URSP in the 2014–2020 period is the same type of measure that the URSP implemented in the 2007–2013 framework; therefore, no major differences are expected from the aspect of administrative qualifications. The project to deepen navigation channels to the Port of Koper will be prepared, managed and supervised by the available and qualified staff of the URSP.

3.2.5 Airport infrastructure

The Republic of Slovenia has three public airports for international air transport, i.e. Ljubljana Jože Pučnik Airport, Maribor Edvard Rusjan Airport and Portorož Airport. All three main airports meet the required conditions regarding regulations on the construction of facilities, including other conditions determined as per the reference code, category, purpose and scope of the air transport. All three airports have valid operating permits.

As per Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (Text with EEA relevance), Ljubljana Jože Pučnik Airport began the certification procedure.

As per the Aviation Act and in connection with the Regulation on the provision of public service obligation for operation of the public airport of state importance[12], Regulation on concession of a public airport Edvard Rusjan Maribor[13] and the Regulation on concession of a public airport Portorož (Concession Act)[14], the Republic of Slovenia grants compensation for public services to companies authorised to perform services of general economic interest, i.e. Aerodrom Maribor, d.o.o., and Aerodrom Portorož, d.o.o. The Republic of Slovenia has thus ensured the provision of airport services at these two airports. Maribor Edvard Rusjan Airport is the only airport whose infrastructure is owned 100% by the Republic of Slovenia, which leased the infrastructure to the operator, Aerodrom Maribor, d.o.o., to be used on the basis of a mutual agreement.

With the contract concluded on 1 January 2014 for no longer than 40 years, the Republic of Slovenia also arranged its relation with the airport and established the building title regarding the use of certain land plots owned by the Republic of Slovenia at Ljubljana Jože Pučnik Airport (contract between the Republic of Slovenia and Aerodrom Ljubljana, d.d.).

The status of land plots and public airport infrastructure are governed by the provisions of the Aviation Act, which stipulates that:

- land plots where public airports and infrastructural facilities, devices and assets may be owned by the state, local community or other public law entities, including private law entities;
- entities may obtain land plots to expand public airports and construct new facilities and devices if they have an airport development programme as per the national civil aviation development programme and other conditions and criteria. These entities have a pre-emptive right to do so;
- public airports, facilities and devices are facilities of public infrastructure, and special provisions of regulations on spatial planning must be observed for their construction;
- infrastructural facilities and devices may be owned by the state, local community or a private law entity;
- if an infrastructural facility, device or asset is owned by an entity that does not own the land plot, mutual relations relating to land use are arranged by contract;
- airport infrastructure includes all land plots used functionally for facilities, devices and assets, and ensure safe air transport and the safe operation of the airport, and
- the provision of safety, and regular and smooth implementation of air transport is in the public interest.

12: Regulation on the provision of public service obligation for the operation of a public airport of state importance (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 12/11).
13: Regulation on the concession for the public airport Edvard Rusjan Maribor (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 26/11).
14: Regulation on the concession of the public airport Portorož (Concession Act) (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 28/11).

Airport infrastructure is not included in the new financial framework, and it is not anticipated to be co-financed by the Cohesion Fund resources.

3.2.6 Mandatory public utility services of public passenger transport

The mandatory public utility service of public passenger transport is implemented as per Regulation (EC) No 1370/2007[15] on public passenger transport services by rail and by road, and national legislation by bus operators and SŽ Potniški promet, d.o.o.

15: REGULATION (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road and repealing Council Regulations (EEC) Nos 1191/69 and 1107/70, OJ L 315/1.

The public utility service of transporting passengers in interurban road transport is carried out by 36 concessionaires on the basis of concession contracts concluded by the end of 2015. Concessions were granted to operators implementing transport while new legislation was being enforced; a new call for granting concessions is underway. Two-year contracts are concluded with the state (MzI) for the implementation of public line bus transport, which are based on the total number of kilometres travelled annually and flat rate costs per kilometre. Flat rate costs per kilometre travelled are determined on the basis of expert analyses, which take into account the costs of vehicles, amortisation, labour costs, costs of fuel, the company and financing, including profit attributable to a well-managed company. The norm price changes in accordance with the movement of costs, and negotiations between concessionaires and the state. The state provides the concessionaires the payment of maximum compensation, which is the difference between flat rate costs per kilometre and total income earned by the concessionaires by passenger transport. However, the compensation has an upper limit; in recent years, it has amounted to 26% of the norm price. In 2013, bus operators transported 25.1 million passengers, thus halting the long-standing decline in their numbers. The Republic of Slovenia paid EUR 20.7 million in compensation to the operators for implementing public utility services.

Source: Statistical Office of the Republic of Slovenia. (Data on the number of passengers transported and passenger-kilometres by 2010 are not comparable due to a change in the methodology of data capture.)

Table 3.1: Public road line transport (interurban and international) by years and measurements

Year	Passengers (1,000)	Passenger kilometers (in million)
2010	28,552	579
2011	25,359	552
2012	24,793	533
2013	25,146	460
2014	26,686	478

Table 3.2: Železniški potniški prevoz potnikov

Source: SURS.

In 2013, SŽ transported 16.4 million passengers by rail. The number of passengers fell in 2014 because transport was terminated on the Primorska line due to the damage to public railway infrastructure caused by glaze ice.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
No. of passengers (1.000) National and inernational transport - total	14.835	5.742	16.131	16.123	16.661	16.355	16.220	15.744	15.512	16.420
Passenger - kilometer (in million) National and international transport -total	763,6	776,6	793,2	812,3	834,1	840,2	813,4	773,2	741,7	760,3

The public utility service in internal rail transport is carried out by SŽ Potniški promet, d.o.o. on the basis of a contract with the Government of the Republic of Slovenia. Contract no. 3/20010-2019 on the implementation of the mandatory public utility service of transporting passengers in internal and regional cross-border rail traffic for the 2010–2019 period was concluded between

the Government of the Republic of Slovenia and the company, Slovenske železnice, d.o.o., on 26 November 2009. The Contracting Authority of the public utility service provides the funds for implementing passenger transport and co-finances it in the amount of EUR 4.5291 (including VAT) per train kilometre travelled. Realised revenue according to the contract with MzI amounted to EUR 40.6 million in 2013.

The status of the PPT authority, which would manage rail and interurban line bus passenger transport as a single system, would have to be arranged accordingly for the implementation of mandatory public utility service. Thus the suitable development of public passenger transport would be ensured and implementation of transport would be supervised. The granting of concessions by means of public calls is mandatory for line bus transport.

The review of management of public transport infrastructure and the mandatory public utility service shows that tasks and powers are too dispersed between various subjects, which reduces the efficiency of implementation and transparency of the tasks conducted. The MzI will thus prepare an in-depth analysis of public infrastructure management of rail, road, maritime and air transport, and of the implementation of the mandatory public utility service with proposals for systemic solutions. Irrespective of the above, the MzI is suitably prepared and disposes of administrative qualifications for the implementation of measures in the new 2014–2020 financial framework.

4 Transport evaluation

4.1 Introduction

The results of transport evaluation are one of the bases for determining present and expected problems of existing transport arrangements, i.e. if the current transport arrangements were not improved. On the basis of the problems established, the measures were determined (in Chapter 6) that have to be realised in order to eliminate the problems.

For passenger and goods transport, the analysis of the present situation was made for 2011, and the analysis of future situation was made for 2030 regarding the current transport arrangements. The analysis followed the CETRA national transport model, which in addition to Slovenia includes the greater part of Europe, all modes of transport and direct co-dependence between socio-economic and transport conditions. The selection of a means of transport, transport efficiency and environmental and social acceptability were analysed.

This chapter initially presents the current transport development in Slovenia, followed by the used transport model, including the data used for the development and assessment of the model. The European and Slovenian socio-economic and transport starting points for the forecast of future transport are presented in the continuation, and the results of this evaluation are given at the end.

4.2 Analysis of current development and situation

4.2.1 Choosing means of transport in the Republic of Slovenia

Passenger transport

Figure 12 shows that in passenger transport, the use of passenger cars prevails; 8% of journeys are by public passenger transport, 5% by bicycle and 18% on foot. The choice of a means of transport is comparable to the way transport means are chosen in Germany. More journeys in Slovenia are taken by passenger car, since Slovenia has a lower level of urbanisation and there are no major cities; however, there are many small, fragmented and dispersed settlements. More journeys by car are taken in small settlements, and fewer journeys in large settlements.

Figure 12.
Mode choice on a working day
* TRB Annual Meeting 2012.

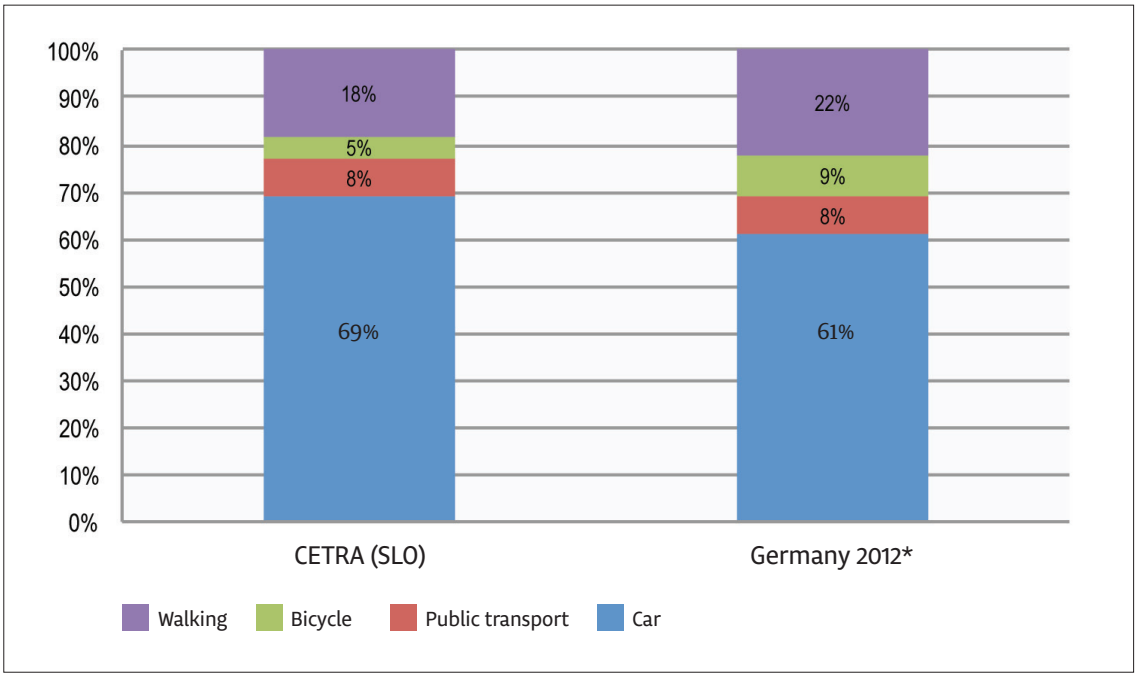


Figure 13.
Share of passengers/ day in the origin-destination transport, 2011

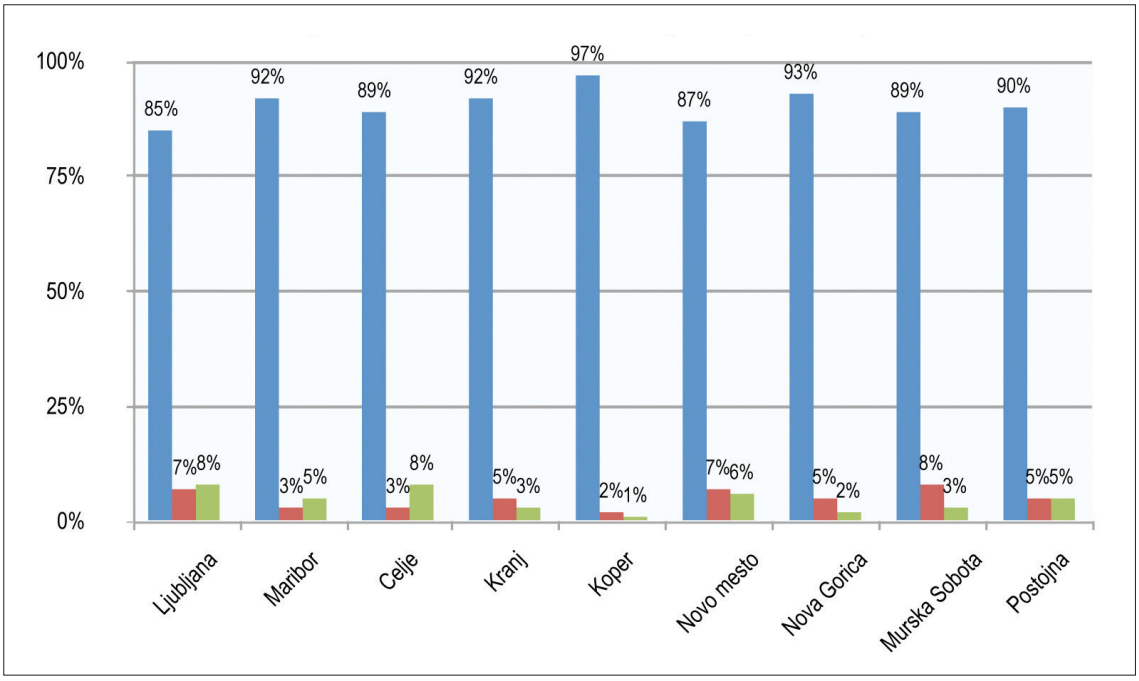


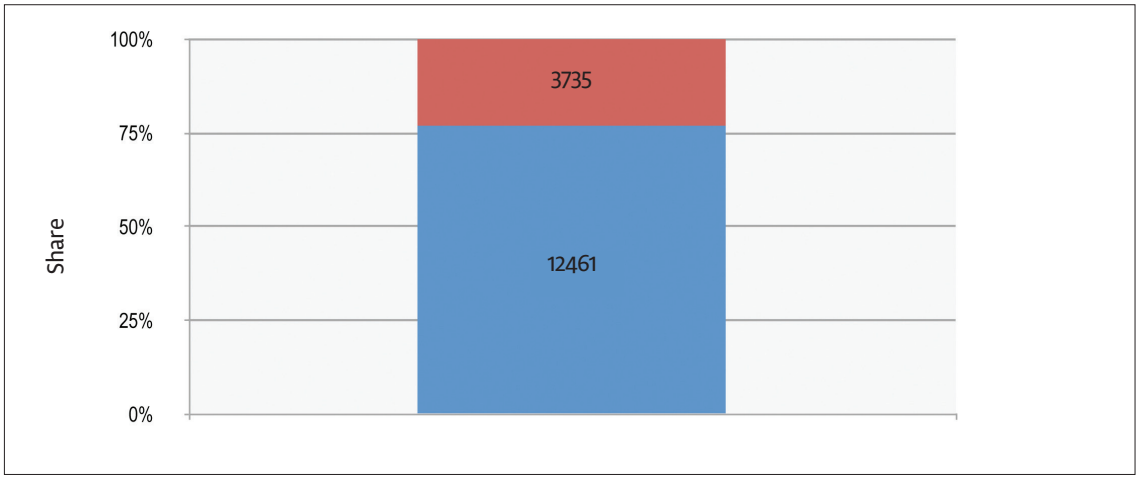
Figure 13 shows the selection of the means of transport when entering and exiting nine major Slovenian cities. The use of private vehicles prevails everywhere, since 85% to 97% of all journeys are taken by car, and only 3% by public passenger transport in Koper and 15% in Ljubljana.

We can establish that private vehicles are the dominant means of transport in Slovenia, which is also the result of the settlement pattern, high motorisation level, relatively unattractive public transport and insufficient or non-systematic implementation of sustainable mobility measures at the national and local levels.

Goods transport

The use of road haulage vehicles also prevails in goods transport. The graph in Figure 14 shows that 23% of transport in Slovenia is implemented by rail and 77% by road. Similar proportions also apply to other European Union countries. We have to emphasise that the statistical data on realised tonnes/kilometres by road vehicles do not exist in individual countries. There are only data on tonnes/kilometres of road vehicles registered in a certain country; therefore, only a general comparison can be made. Nevertheless, we can establish that in the entire European Union (EU 27), similar choices of means of transport apply, since 75.5% of cargo was transported by road in 2011 (expressed in tonnes/kilometres), 18.4% by rail and 6.2% by inland waterways. The modal relations shown in Figure 14 are determined by models.

Figure 14.
Share of a type of goods transport in the area of Slovenia, 2011



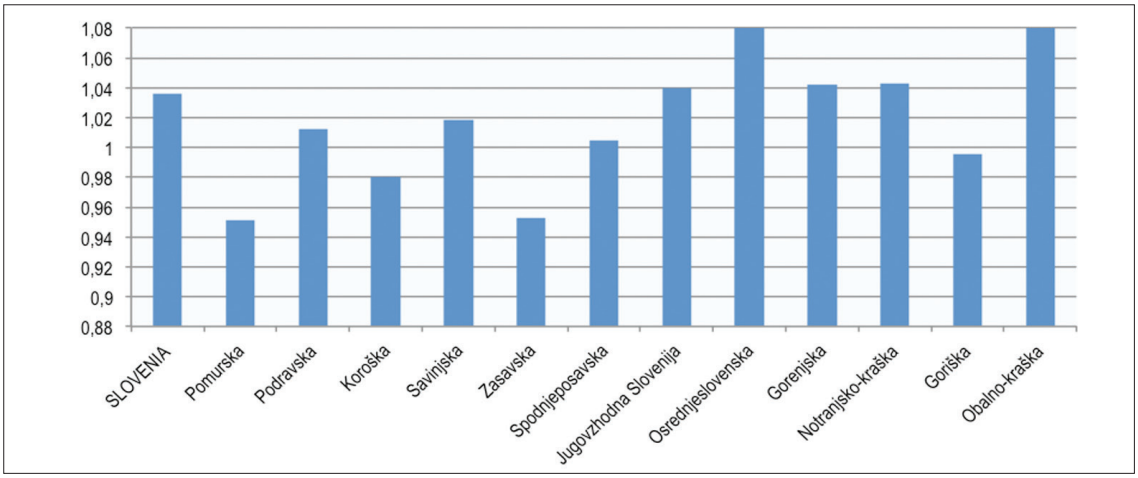
4.2.2 Current development of passenger and goods transport

Demographic features

In 2011, 2,052,496 people were living in Slovenia; in the past ten years, the number of people has gradually increased; by somewhat more than 3% in the past 12 years. The relation between age groups is slowly changing in favour of older people and to the disadvantage of younger generations. The share of people under the age of 30 has decreased by 5% in ten years; the share of elderly people over the age of 60 has at the same time increased by 2%. The share of the age group between the ages of 30 and 59, i.e. the age group that is most active, has also increased by some 3% in this period. However, the share of this age group will decrease in the future. The low birth rate causes an exceptional ageing of population and a long-term reduction in population.

With respect to the number of people, relations between statistical regions have not changed significantly in the past ten years. There is a trend of less developed areas emptying and more developed areas filling. In ten years, the number of people in the Pomurje region decreased by almost 5%, in the Zasavje region by over 4%, in the Koroška region by 2% and in the Goriška region by less than 1%. In other regions, the population in the same period increased, mostly in the central Slovenian region and the coastal and Karst region, i.e. by 8%. The population in this period increased by more than 2% in the Gorenjska region, SE Slovenia and the Notranjska-Karst region.

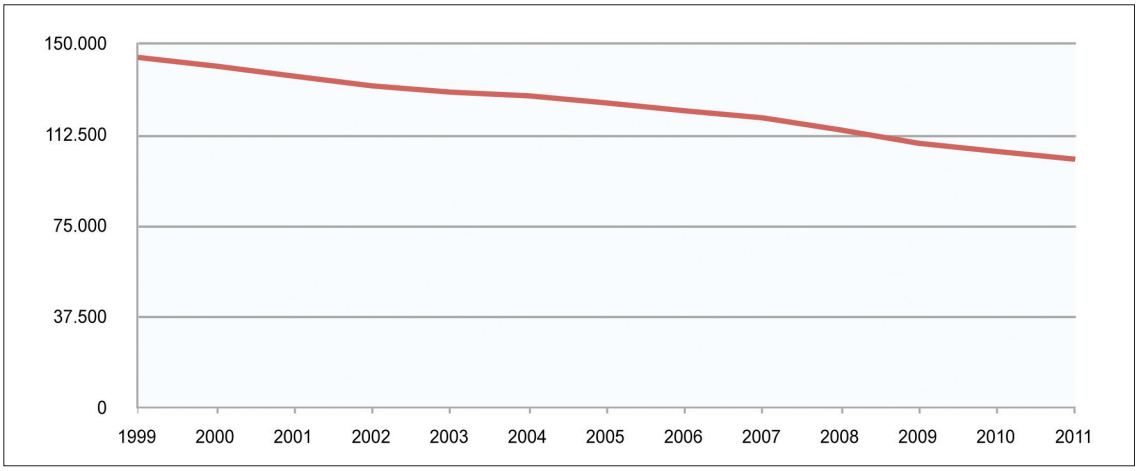
Figure 15.
Increase and decrease in population by statistical regions in the 1999 to 2011 period
Source: SURS.



Number of secondary school pupils and students

In 2011, there were some 103,000 secondary school pupils and some 115,000 students in Slovenia, which is quite a high number of young people, who have quite an impact on the increase in transport. From 1999 to 2011, the number of secondary school students decreased significantly, i.e. by 29%, while the number of students in that period increased by 1 or 2%.

Figure 16.
Movement of the number of secondary school pupils in the Republic of Slovenia in the 1999 to 2011 period
Source: SURS.



The number of secondary school pupils has decreased in all regions in the past decade, mostly in those regions where the overall population decreased, i.e. in the Pomurje region by 36%, in the Zasavje region by 30% and in the Koroška region by 28%. The lowest reduction in the number of secondary school pupils was in central Slovenia, i.e. by 16%, and in SE Slovenia, i.e. by 18%. Elsewhere, the number of pupils decreased at approximately the same rate as the average decrease in the Slovenian population.

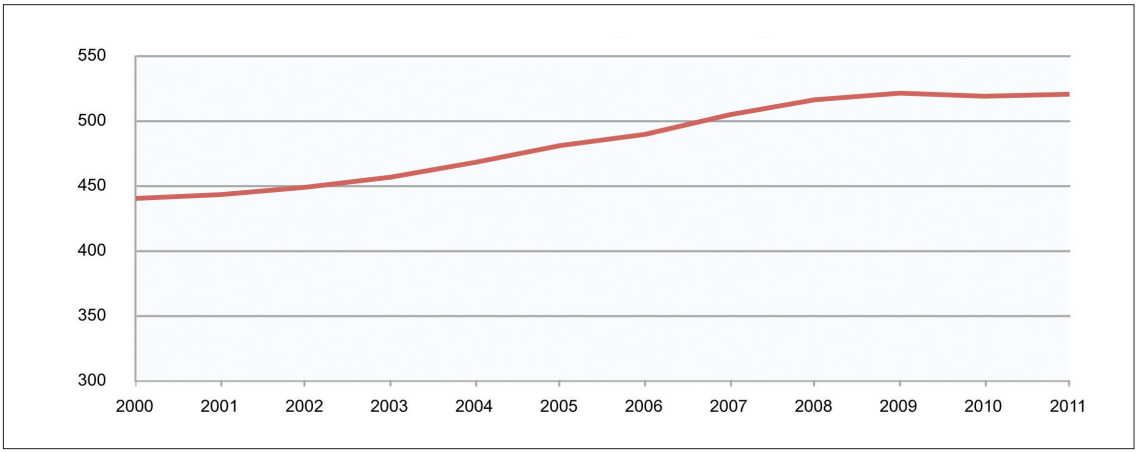
The number of secondary school pupils is important, because they are among the main users of public passenger transport (also due to subsided tickets). In the future, the share of younger people will be lower, which will probably lead to a reduced use of public passenger transport if the current developmental direction of implementing transport policy does not change significantly.

Increase in motorisation

In the past twenty years, motorisation in Slovenia increased by 23%, and amounted to 523 private vehicles/1,000 people in 2011. Slovenia has thus almost caught up with European countries with the highest motorisation rate, and it ranks among the most developed European countries in this respect. Because of the crisis, motorisation growth stagnated in 2009.

The motorisation rate in four regions in Slovenia was above average, and in 2011, it amounted to: 580 in the Goriška region, 586 in the coastal and Karst region, 543 in the Notranjska-Karst region and 547 private vehicles/1,000 people in the central Slovenian region. A markedly below-average motorisation rate was noted in the Zasavje region (460), the Pomurje region (465), the Koroška region (483) and the Podravje region (491 private vehicles/1,000 people).

Figure 17.
Motorisation growth in Slovenia
Source: SURS.



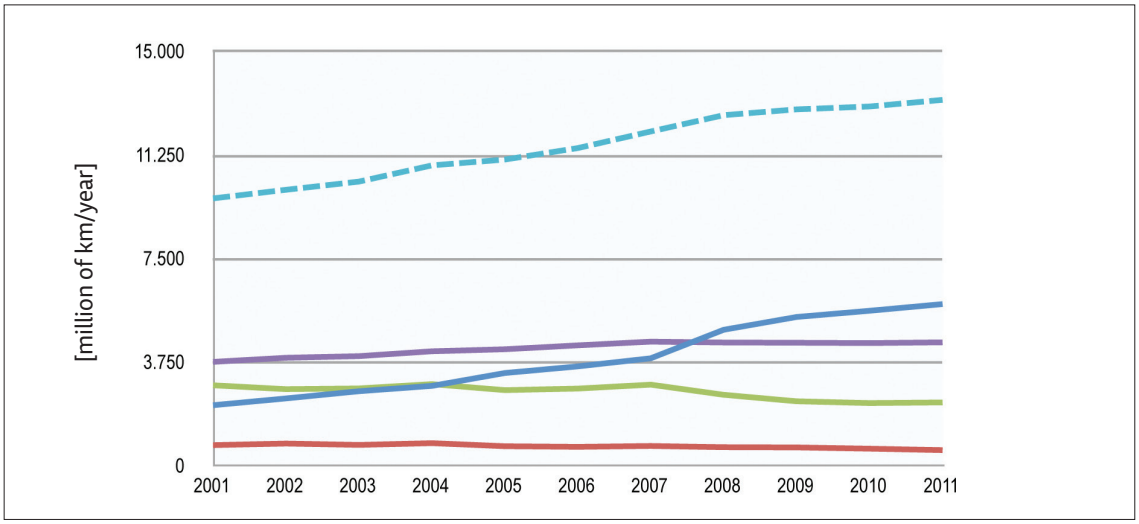
Motorisation by regions is gradually equalising, because it is growing above average in less developed areas and below average in more developed areas.

High motorisation also leads to more use of private vehicles. Motorisation in Slovenia is quite high with regard to GDP and personal income. This is also affected by the dispersed settlements typical of Slovenia, which demand greater use of private vehicles; at the same time, the use of private vehicles also accelerates the construction of such settlements.

Transport by roads

Transport by private vehicle is constantly rising. From 1999 to 2011, transport increased by 32%. The average growth rate was about 3% per year. Due to the crisis, growth has been stagnating since 2008, and a decline in the volume of traffic has been detected in some areas. Once the economic growth is positive again, this mode of transport will also increase.

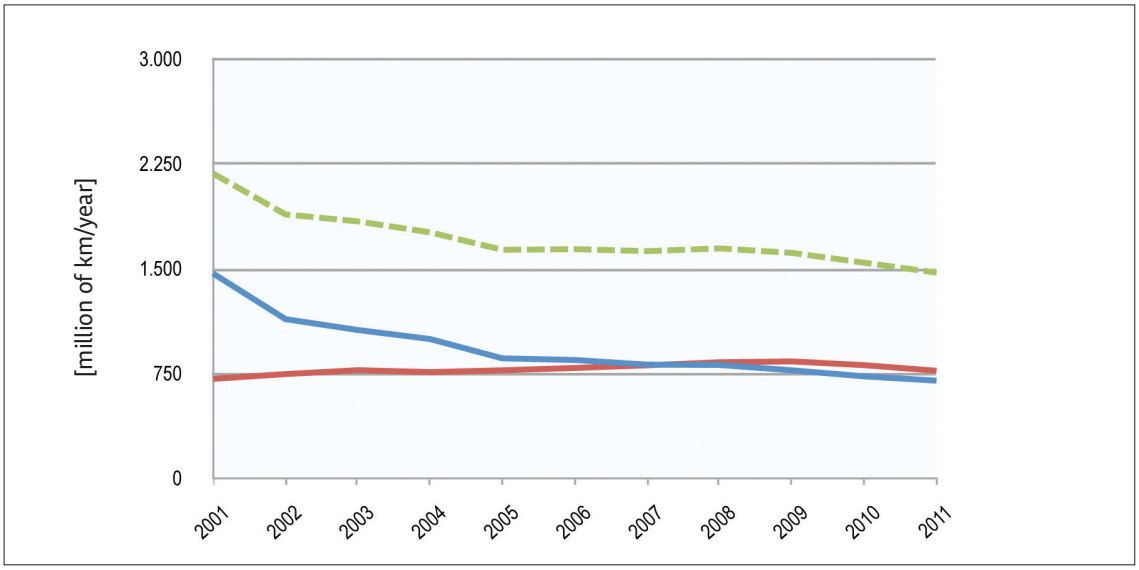
Figure 18.
Increase in transport by types of road in the period from 2001 to 2011
Source: DRSI.



Passengers travelling by public transport

While in the past, automobile transport constantly increased, the number of passengers that travelled by public passenger transport has decreased. Road, i.e. public bus passenger transport (which does not include urban public passenger transport) decreased by 38% from 2002 to 2011, or 3.7% per year. The number of passengers travelling by urban public passenger transport decreased by 13.4% in the same period. Rail passenger transport slowly increased, but only until 2009, whereupon it began to decrease.

Figure 19.
Increase in public transport by type of transport from 2001 to 2011
Source: SURS.



From 2001 to 2008, public passenger transport increased by 16.6%, and then decreased by 13.8%. In total, public bus and rail passenger transport decreased by 32% or by 2.8% per year from 2001 to 2011.

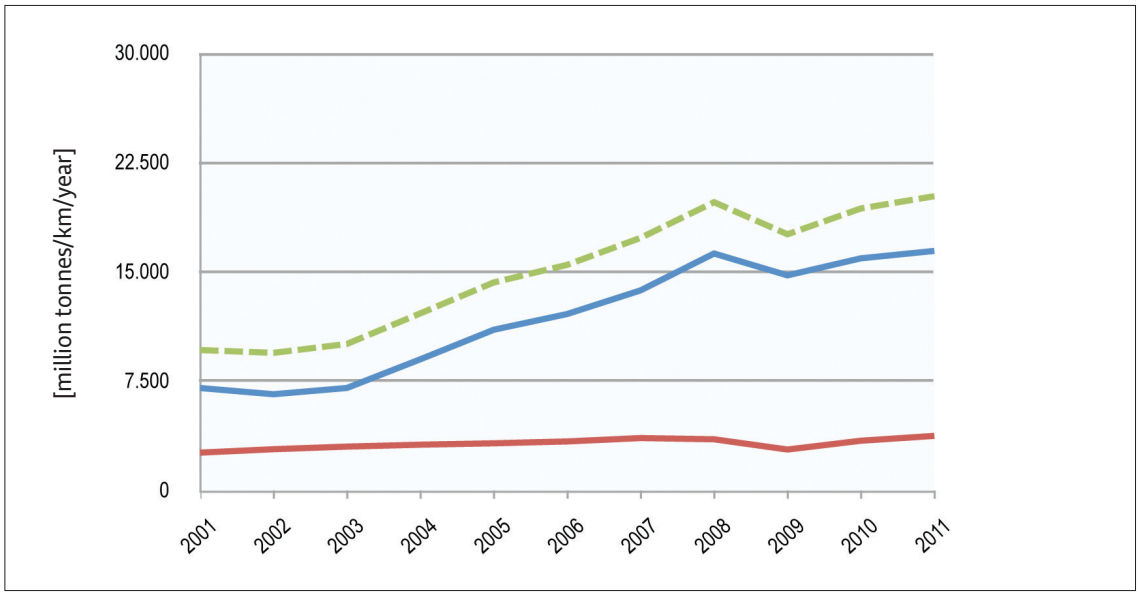
The current developmental direction regarding the selection of public transport means is such that the use of private vehicles is constantly increasing, and the use of public transport is decreasing.

Goods transport

Road and rail goods transport are increasing. However, road goods transport is increasing significantly faster than rail goods transport. The graph in Figure 20 shows that goods transport increased until 2008, decreased between 2008 and 2009 and has been rising again since 2009. Some 149% more cargo was transported by road in 2011 than in 2002. Road goods transport increased in this period at an average annual rate of more than 11%. Rail transport increased by 32% in this period or an average of 3.1% per year.

Figure 20.
Increase in freight transport by type of transport from 2001 to 2011

Source: SURS.



Transport at the Port of Koper and Ljubljana Jože Pučnik Airport

In the past eleven years, freight transport at the Port of Koper increased by an average of 5.6% annually, passenger transport at Ljubljana Jože Pučnik Airport increased by 3% and freight transport by 8.5%. In the past years, transport at the port and at the airport increased relatively rapidly. A decrease in transport was recorded on almost all levels after 2008, but freight transport once again started increasing in 2009 (except in 2012, when it dropped at the airport significantly, while it again started to increase in 2013); passenger transport continued to decrease, i.e. until last year, when it started increasing again.

Table 3.3:
Transport at the Port of Koper and Ljubljana Jože Pučnik Airport by year

Source: Annual reports of considered institutions.

Year	Port of Koper	Letališče Jožeta Pučnika Ljubljana	
	Transhipment (tonnes)	No. of passengers	Air cargo (tonnes)
2000	9.321.832	991.693	5.774
2001	9.353.991	894.130	5.683
2002	9.431.497	872.966	5.187
2003	11.036.457	928.397	5.027
2004	12.402.607	1.048.238	5.017
2005	13.066.102	1.218.896	5.245
2006	14.030.732	1.334.355	8.059
2007	15.362.979	1.524.028	13.176
2008	16.050.448	1.673.050	9.118
2009	13.143.620	1.433.855	14.333
2010	15.372.043	1.388.651	17.310
2011	17.051.314	1.369.485	19.659
2012	17.880.697	1.198.911	17.031
2013	17.999.662	1.321.153	17.777

Figure 21.
Transshipment of cargo at the Port of Koper, 2000 to 2013

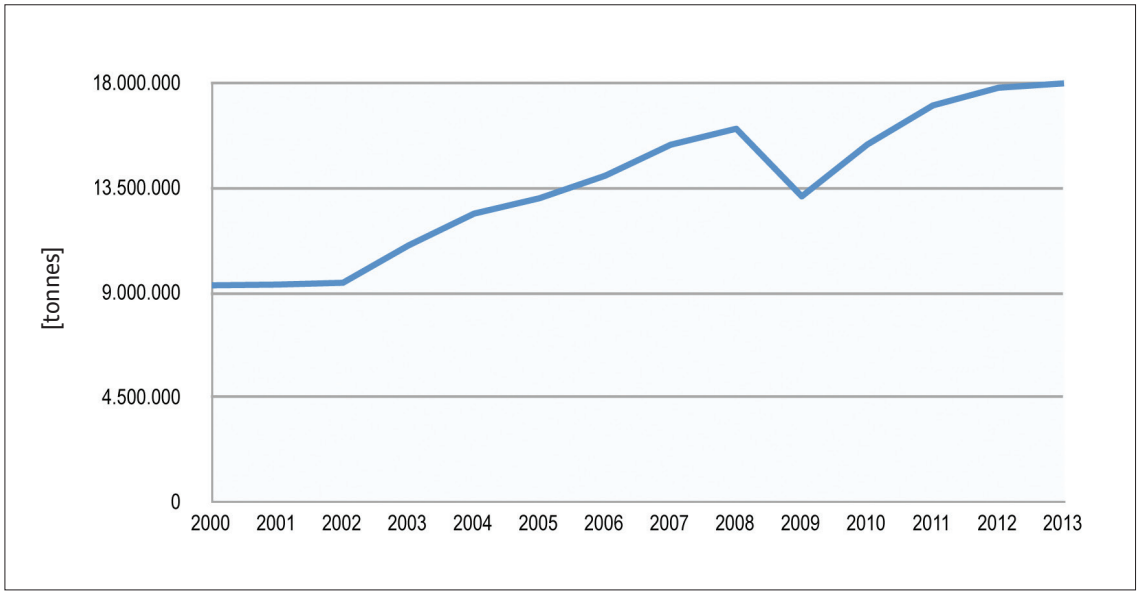


Figure 22.
Number of passengers at Jože Pučnik Airport, 2000 to 2013

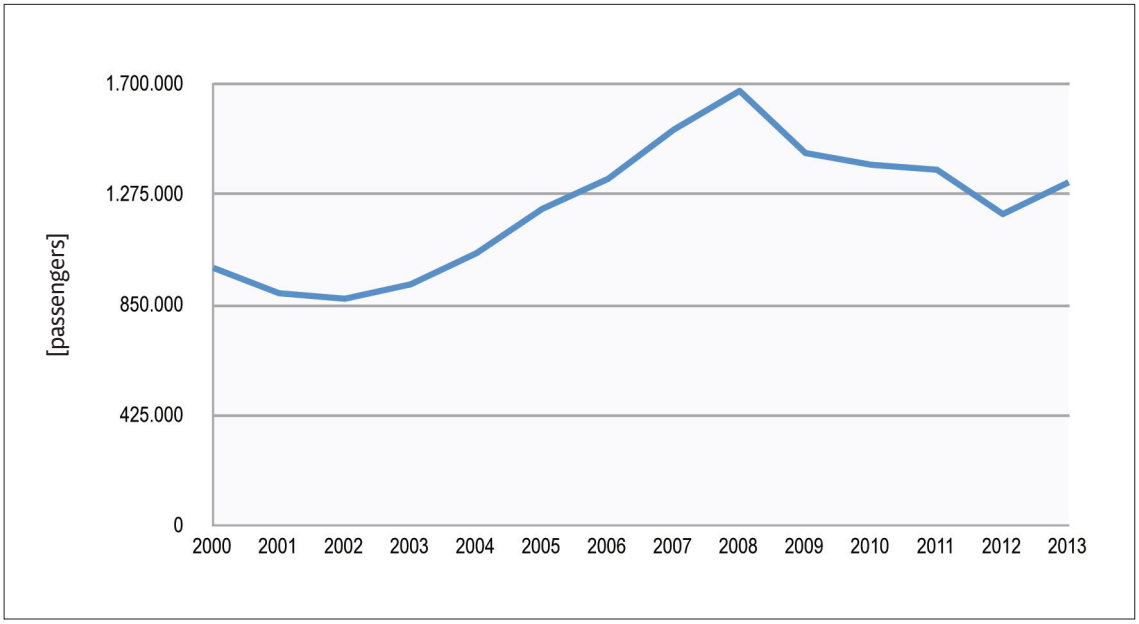
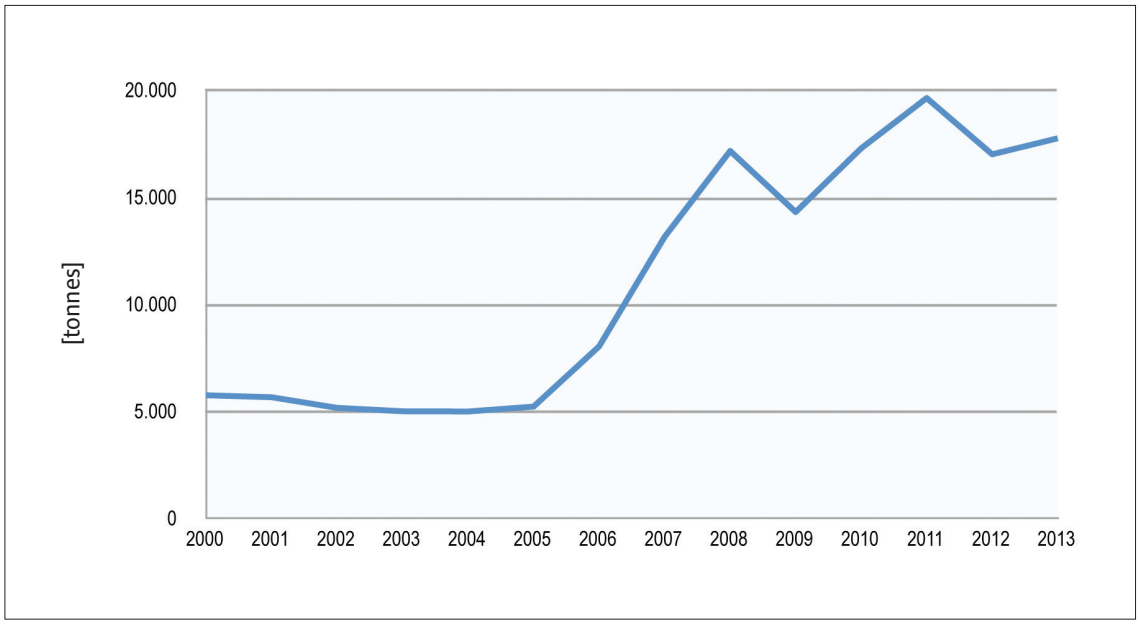


Figure 23.
Volume of air cargo at Ljubljana Jože Pučnik Airport, 2000 to 2013



4.2.3 Transport flows in 2011

Goods flows

Transport burdens of goods transport are displayed in figures below. Transport flows of goods by rail and road are shown in 1000 net tonnes/year.

The current situation (2011) of goods flows in Slovenia and its vicinity shows that goods flows are relatively strong on the following routes: Divača–Ljubljana, Ljubljana–Zidani Most and Zidani Most–Pragersko, and do not lag behind volumes in neighbouring corridors.

A total of 40 million net tonnes/year were transported in 2011 by rail and road on the Brenner Pass, which is one of the most important European corridors and connects the economies of Germany and Italy through Austria. According to estimates[16], some 50 million net tonnes/year were transported by road and rail on the most burdened Austrian corridor Vienna–Linz. In the area of Koralm, some 22 million net tonnes/year were transported.

16: Precise information is not available to the public, but values are estimated based on the known number of goods trains and road haulage vehicles.

A total of 34 million net tonnes/years were transported by rail and road on the Slovenian Divača–Ljubljana corridor, and 37 million net tonnes/year on the Ljubljana–Zidani Most corridor (including the railway line and the Štajerska and Dolenjska motorways), which is almost as much as over the Brenner Pass. Some 21 million net tonnes/year were transported on the Zidani Most–Pragersko section, which is almost as much as through the Koralm Tunnel.

On all corridors, more goods are transported by road than rail; 27 to 40% of goods are transported by rail on the analysed corridors. Somewhat more goods are transported in Austria by rail (36 to 40%), and slightly less over the Brenner Pass and in Slovenia (27 to 38%).

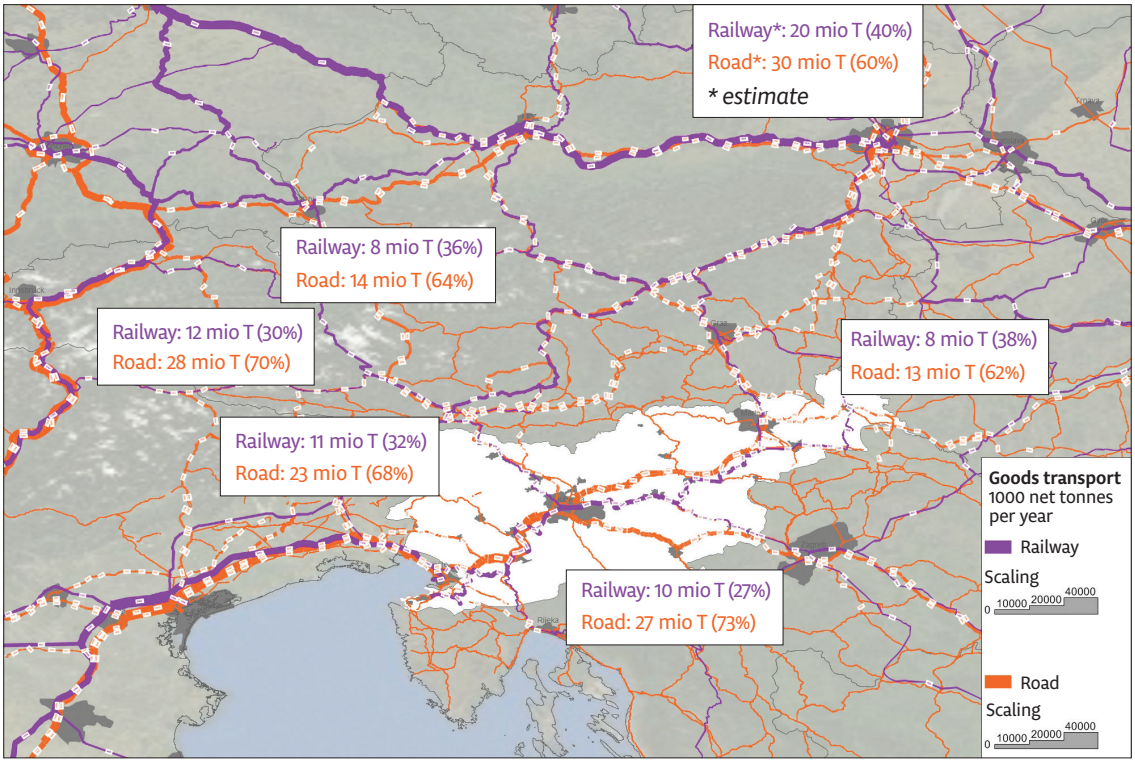
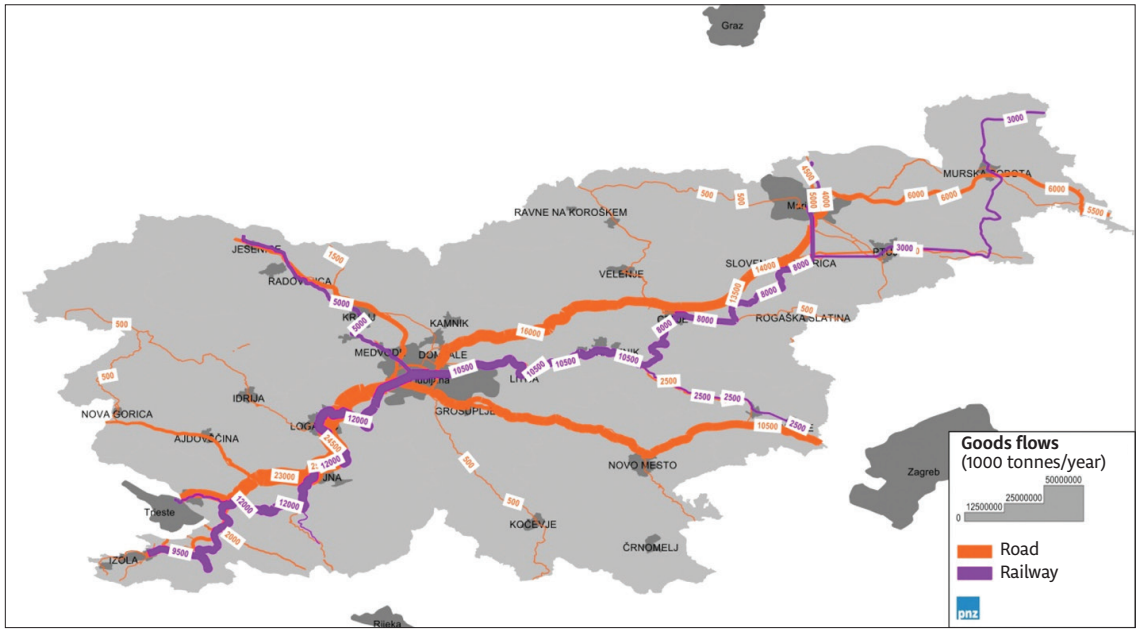


Figure 24. Loads carried by rail and road haulage (net tonnes/year), 2011, wider area

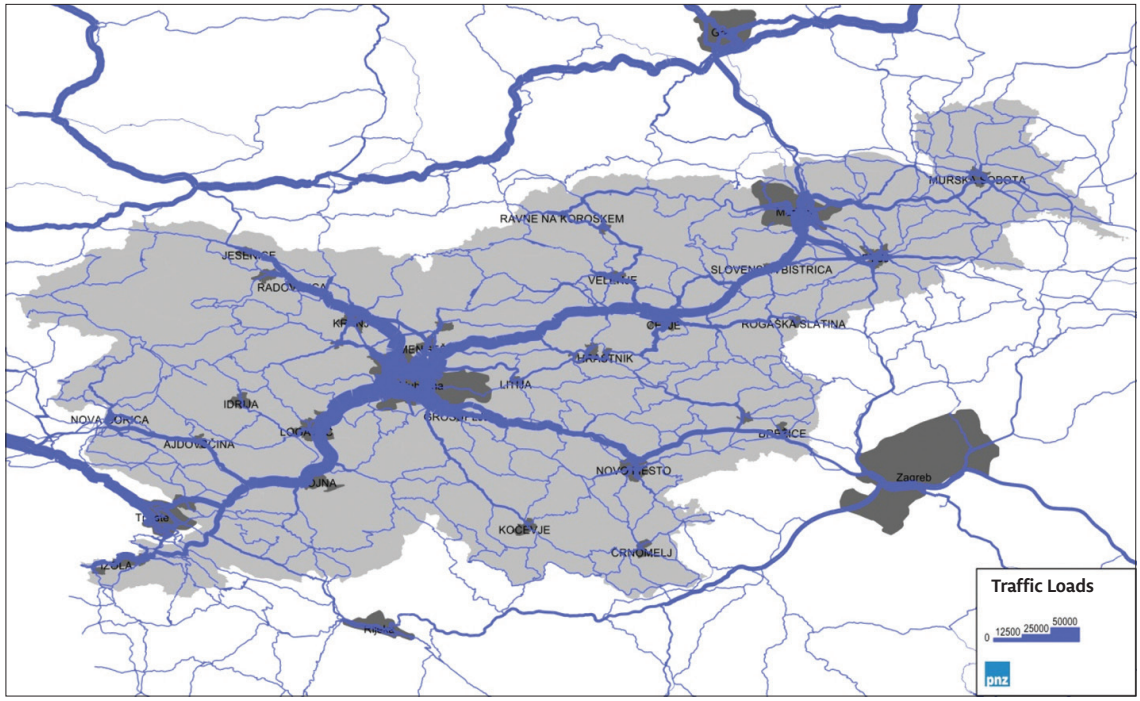
Figure 25.
Loads carried by rail and road haulage (net tonnes/year), 2011, narrow area



Road transport

The modelled transport flows on the current network are approximately the same for 2011 as the counting data. As is already known, most transport takes place on the Slovenian motorway cross. The area of Ljubljana with its motorway ring and connection sections stands out, along with the Maribor area. Currently, there are approximately 55,000 to 60,000 vehicles/day on the connection motorway sections around Ljubljana, which is close to the capacity limit. The SW-NE direction carries the greatest burden on the motorway cross, similarly to rail transport.

Figure 26.
Road transport load (vehicles/working day), year 2011



Transport flows in Ljubljana's surrounding area do not lag behind the flows in other bigger cities (Vienna, Munich, Venice–Trieste section). Ljubljana is smaller, but has a good geostrategic position, which is also very interesting for international transport, especially in the direction of the Mediterranean corridor.

Public passenger transport

Generally, there is more public transport around major urban agglomerations, i.e. in the vicinity of Vienna, Munich and the Venice–Trieste section. There is significantly less public passenger transport in Slovenia; the area around Ljubljana stands out.

Figure 27 shows the current situation of existing (rail and bus) public transport. Buses carry approximately the same number of passengers as trains, but bus passengers are distributed throughout the network, while rail passengers are concentrated in a few corridors. Five railway corridors towards Ljubljana are especially important here, i.e. on the Zidani Most–Ljubljana section. More transport also takes place on the Šentjur–Celje, Laško–Celje and Pragersko–Maribor routes.

Figure 27.
Public passenger transport load (passengers/working day), 2011

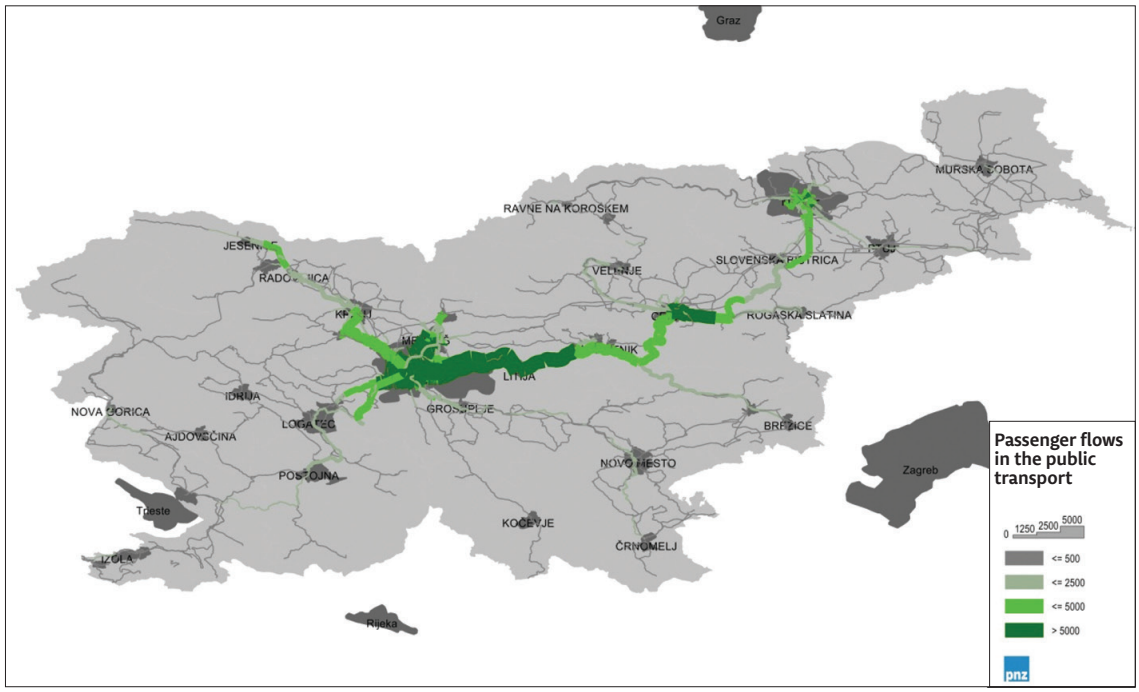


Figure 28 shows the number of entries and exits at stops and stations; the majority of these are concentrated around Ljubljana (Vrhnika, Borovnica, Kranj, Medvode, Domžale, Grosuplje etc.) and Maribor, including Celje, Zidani Most, Zagorje, Litija, Ptuj etc.

Figure 28.
Number of entries and exits in public transport (entries and exits/ working day), 2011

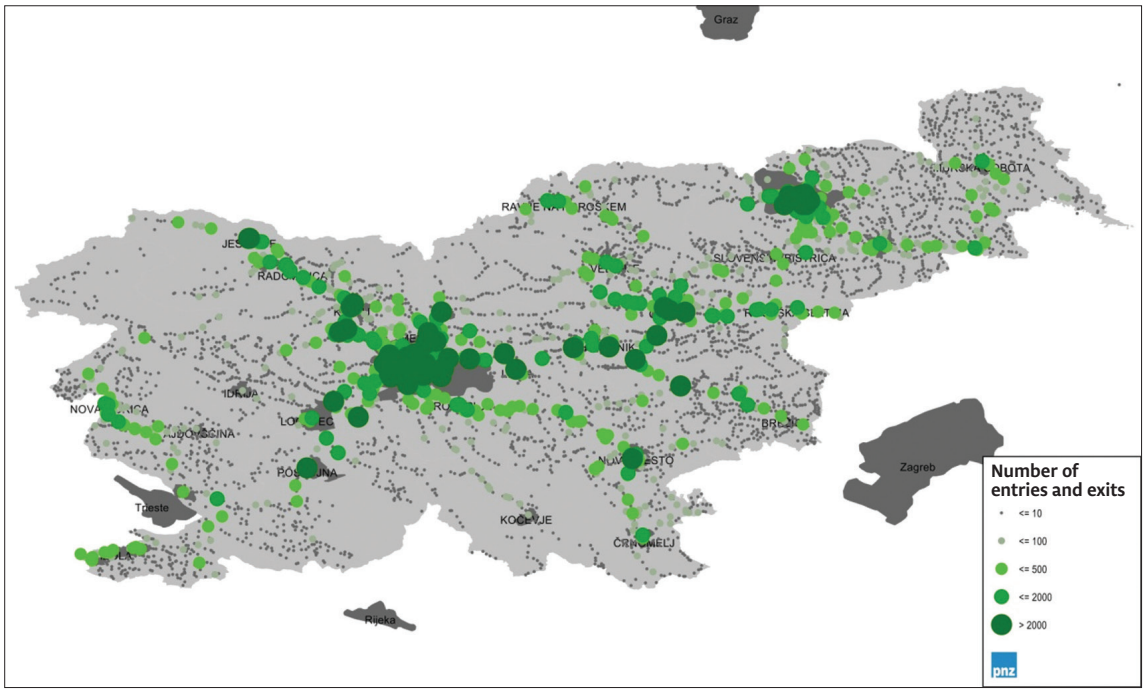
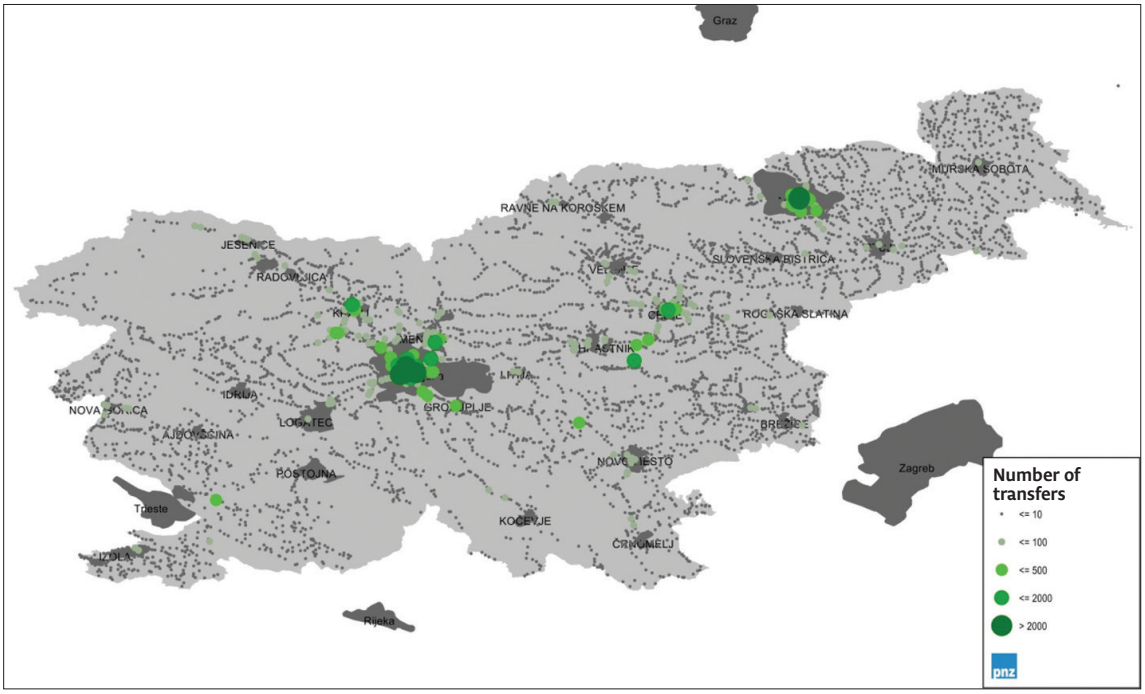


Figure 29 shows changes of transport means, mostly in Ljubljana, Maribor and Zidani Most.

Figure 29.
Number of entries and exits in public transport (entries and exits/ working day), 2011



4.3 Transport model

4.3.1 Introduction

Transport evaluation is carried out with the national transport model, consisting of the CETRA and PRIMOS[17] models. The Slovenian transport model is a tool for a rather objective evaluation of the effects of strategies for future transport arrangement at the national level. The results of forecasts based on this model are the basis for transport, environmental and economic evaluations of versions.

17: Both models were developed between 2004 and 2013 by the company PNZ within public procurements of the Ministry of Transport, the Ministry of Infrastructure and the Slovenian Roads Agency.

In addition (to the transport model), the legislative and political frameworks (national and EU) will have to be taken into account in the final proposals for solutions, which should fulfil the purpose and attain the objectives of this Strategy.

4.3.1.1 Data for the development and validation of the transport model

The quality of the transport model greatly depends on the quality of input data. Therefore, the most reliable and credible data were used.

Two types of data were used:

- data for developing the model:
  - travel rules for developing the demand model for passenger transport,
  - production and consumption, import and export of assets, and the logistics system for the demand for goods transport,
  - use of surfaces and socio-economic quantities for demand modelling;
- data for calibrating and validating the model:
  - data for the motorisation model,
  - data for the passenger transport model,
  - data for the goods transport model.

The data for developing the model are an essential basis for its development, while data for calibration and validation are intended for fine tuning the model and confirming its credibility.

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4.3.1.2 Data for model development

4.3.1.2.1 Travel rules for developing the passenger transport model

Data for modelling generation factors, transport mode choice, distribution, occupancy of vehicles:

- Revealed preference survey in households, survey of travel habits of Ljubljana Region residents, PNZ, Ninamedia, URBI, 2003.
- Revealed preference survey in households in the Republic of Slovenia; Slovenian Roads Agency, 1999–2000.
- DATELINE – Design and Application of a Travel Survey for European Long–distance Trips Based on an International Network of Expertise; Trias Consulting S.A. & Partners, 2003.
- Mobilität in Deutschland, Bundesministerium für Verkehr; Bau in Stadtentwicklung, 2008.
- Eurostat, EU.

Data for determining sensitivity to change (probability and utility functions):

- Research of additional elements for transport mode choice via a stated preference survey; University of Ljubljana, Traffic Technical Institute, 2009.

- Stated preference survey in trains and at petrol stations in Slovenia, PNZ; University of Ljubljana, Traffic Technical Institute, 2012.
- Value of time for road users, stated preference survey; University of Ljubljana, Traffic Technical Institute, 2007.

Data for external transport modelling:
- Survey at road border crossing points; Slovenian Roads Agency, PNZ, 2003.
- Tracking registration plates at road border crossing points and control points; Slovenian Roads Agency, PNZ, 2006.

4.3.1.2.2 Basis for developing the goods transport model

The development of the goods transport model is based on the following origins:
- Production and consumption by commodities in Slovenia; Statistical Office of the Republic of Slovenia (SURS), 2012.
- Export and import by commodities in Slovenia; SURS, 2012.
- Export and import in European countries by commodities; statistical resources of Eurostat, EU.

The data of the Statistical Office of the Republic of Slovenia are the basis for establishing production, consumption, exports and imports at the national level. These value were broken down by traffic zones and are the basis for calculating generation factors.

4.3.1.2.3 Socio-economic data

The following data were used to develop the model of the current situation:

1. Data on residents (to develop production and attraction):
- Central Population Register; Ministry of the Interior (MNZ), 2012.
- Number and structure of the population; Eurostat and statistical offices in neighbouring countries.
- Shares of employees, primary school children, secondary school students and university students; SURS, 2012.
- Number of employees and their structure, Eurostat.

The data are reliable and regularly published at the municipal level.

2. Data on jobs (to develop production and attraction):
- Jobs by sectors and addresses, Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES), 2012.
- Survey on employees in organisations; Slovenian Roads Agency, 2012.
- Jobs in European countries, Eurostat, EU; statistical offices in neighbouring countries.

Based on the survey in organisations with over 100 employees, the precise locations of jobs were determined in Slovenia.

3. Data on sales areas, enrolments and technical capacities (to develop attraction):
- Sales capacities in retail stores; SURS, 2001.
- Survey on the surface of sales areas and employees; Slovenian Roads Agency, 2008.
- Sales capacities, Eurostat, EU.
- Enrolments at primary and secondary schools, and universities; Ministry of Education, Science, Culture and Sport (MZIKS), 2012.
- Accommodation capacities, arrivals and overnight stays of tourists; SURS, 2012.
- Accommodation capacities at the European level; Eurostat. EU.

The following data were used to develop the model of the future situation:

- Forecast of gross domestic product growth rate; Institute of Macroeconomic Analysis and Development of the Republic of Slovenia (UMAR), 2009.
- 2012 EU Reference Scenario modelling; Draft transport activity projections, EC, 2012.
- Forecast of the number of population and their age structure by regions, NUTS 2; Eurostat, 2011.
- Database of development areas in Slovenian regions; Urban Planning Institute of the Republic of Slovenia, 2009.
- Database of Slovenian business zones; Public Agency of the Republic of Slovenia for Entrepreneurship and Foreign Investments (JAPTI), 2010.

Most data are available at the level of countries, and NUTS 2 and NUTS 3 regions. In Slovenia, the data from basic GIS base of e-houses for residents are available by houses.

The division into smaller spatial units is carried out in accordance with the data available and spatial logic.

In Slovenia, the distribution of jobs based on the data from AJPES is suitably corrected on the basis of the survey so that jobs are distributed in accordance with the actual situation. The floor areas of sales areas were also suitably corrected so that they approximately fit the actual situation.

The forecast of the growth in gross domestic product required for forecasting motorisation, mobility and the value of time is based on the 2009 UMAR forecast and the latest forecast of the European Commission for 28 EU Member States.

4.3.1.2.4 Data for calibrating and validating the model

Data for the motorisation model

1. Statistical and other data:

- Statistical data on the population, schoolchildren and jobs; MNZ, SURS, AJPES, 2011.
- Number and structure of the population and jobs in European countries; Eurostat, EU and statistical offices by European countries.
- Active working population by municipalities, residence and municipality of post, SURS, 2011.
- Number of employees and their structure by countries; Eurostat, EU.
- Mobilität in Deutschland, Bundesministerium für Verkehr; Bau in Stadtentwicklung, 2008.
- Part of data from a revealed preference survey in households, survey of travel habits of Ljubljana Region residents; PNZ, Ninamedia, URBI, 2003.
- WebTAG 3.10.4 Variable Demand Modelling–Convergence Realism and Sensitivity, 2010.

2. Count data:

- Count data collected by automatic counters and manual counting; Slovenian Roads Agency, 2011.
- Auswertung und Darstellung der Ergebnisse der automatischen Straßenverkerhrzälung; BMVIT, 2011.
- Verkehr und Zahlen; BMVIT, HERRY, 2011.
- Le Future TENT–T: Strumento di Crescita e Rilancio dell' Economia Europea; AISCAT, 2011.
- Trafico e Sicurezza; AISCAT, 2012.
- 2010. Evre vonatkozo keresztmetsczeti forgalma; Magyar Közut, 2011.
- Brojanje prometa na cestama; Hrvatske ceste, 2011.
- Counting passengers on trains, SŽ, 2011.
- Goods transport on trains, SŽ, 2011.
- Verkehrsprognose Ősterreich 2025+ Endbericht; Trafico & Partners, 2009.
- Sistema Informativo per il Monitoraggio e la Planificazione del Transporti; SIMPT 2, TPS & PTV, 2008.

- Counting passengers on interurban and suburban bus lines; PNZ, 2012.

In Slovenia, data from 648 counting locations on state roads which facilitate detailed analyses (past and current flows by type of road and vehicle, rush hours) are available.

The company Slovenske železnice counts passengers during one week in March. Data are available at sections and stations in the form of passengers per day.

Data on bus passengers are available for areas around larger towns and at selected cross-sections.

4.3.2 Design of the entire model

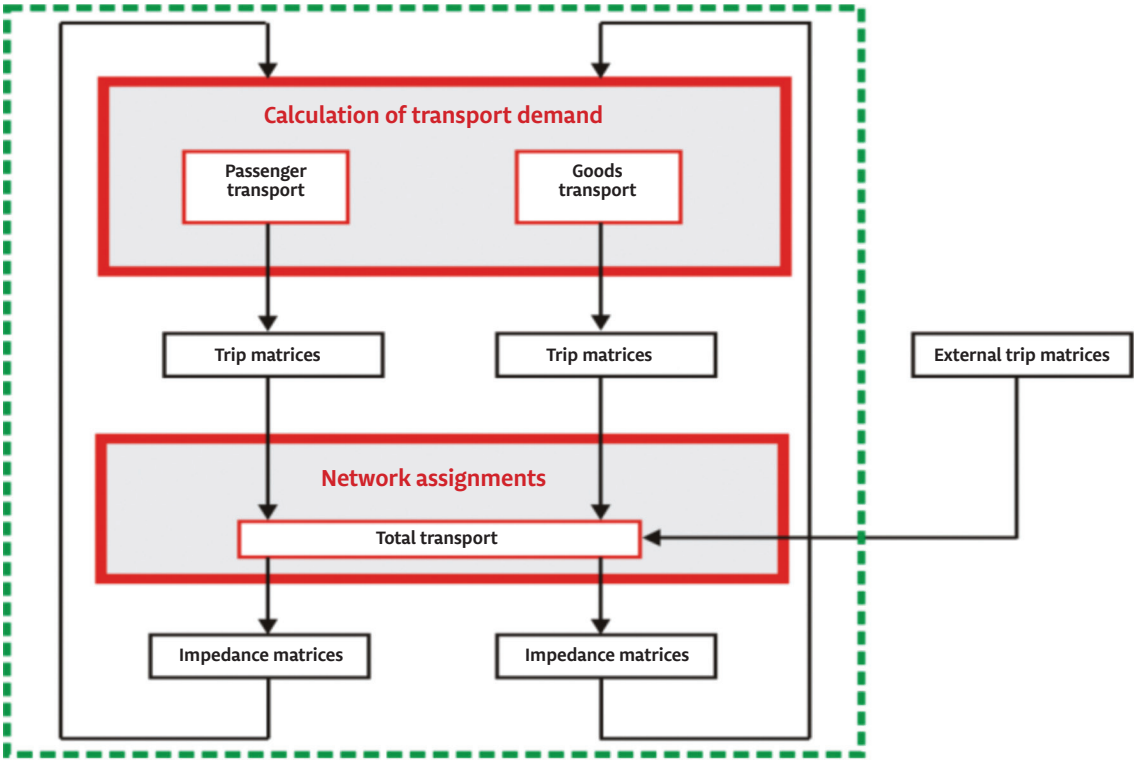
4.3.2.1 Basic characteristics

The transport model consists of an internal and external transport models, and models of the impact on the environment and traffic safety. All models are combined into a whole and are strategic.

The internal transport model is developed for the Central European area extending from the Atlantic Ocean to the Black Sea, and from the Baltic to the Mediterranean. It consists of two sub-models: the national sub-model of the Republic of Slovenia based on the previously prepared PRIMOS model, and the sub-model of the remaining area of the internal model. The national sub-model is more detailed and includes all intrazonal and interzonal trips, and intrazonal and interzonal transport, while the model of the remaining area of the internal model includes only interzonal trips and interstate transport. This transport model which encompasses the wider discussion area is called CETRA (CEntral European TRAnsport model).

External transport, i.e. transport originating from and/or going outside of the area of the internal model is summarised from the second generation TRANS-TOOLS pan-European transport model. This model comprises transport from the area of Europe which is not included in the internal model, and the rest of the world.
The sub-model of environmental impacts and traffic safety has been developed only for Slovenia.

Figure 30.
Design of the entire central European transport model, which includes passenger and goods transport



Both passenger and goods transport were modelled.

On the one hand, internal transport depends on conditions in Slovenian regional centres in connection with their gravitational hinterland, intraregional and interregional relations, and specific Slovenian characteristics, and on the other hand, on globalisation processes which also affect Slovenia. As a small country in terms of area, Slovenia depends on its environment even more than other countries. Therefore, the internal transport model encompasses its territory as well as its direct area of influence.

External transport depends primarily on globalisation processes and European characteristics, which are included in the external model.

The internal and external transport models are strategic, and include interdependence between settlements, socio-economic and traffic conditions, and elements of the transport system. They both facilitate credible modelling of changes in mode choice for both passenger and goods transport. In accordance with European and Slovenian transport policies, public passenger and rail goods transport will assume a major role in the future.

Transport models for internal and external passenger and goods transport comprise four steps. These include traditional steps: production and attraction, distribution, transport mode choice, and assignment. This means that the growth factor method and frequently related subjective assessments are completely excluded. The model is based entirely on objective bases and clear positions. Thus, in principle, the result of the model does not depend on the subject working with the model.

As is commonly known, the first three steps represent demand, and the last step represents assignment. Demand is modelled separately for passenger and goods transport, while assignment is common to both of them.

In accordance with the project task, transport is modelled on an average working day and during the afternoon rush hour. 2011 is the base year, while 2020 and 2030 are the forecast years. The model for the base year is calibrated and validated according to international criteria, and developed using the VISUM 12.00 software tool.

4.3.2.2 Structure of the model

The internal and external models comprise all relevant means of transport and infrastructure networks, i.e.:

1. the internal passenger transport model
- Slovenia:
  - private vehicles (including public car parks in larger towns),
  - public passenger transport (trains, line and non-line buses),
  - park and ride (private vehicles, trains, line buses),
  - airports,
  - bus and railway stations and stops (as an essential element in the infrastructure network for efficiently implementing public passenger transport),
  - transfer points,
  - bicycles, and
  - walking;
- the rest of Central Europe:

- private vehicles,
- public passenger transport (trains, line buses),
- airports and airline routes,
- ferries,
- bus and railway stations and stops,
- transfer points.

2. the internal goods transport model

- Slovenia:
  - trains,
  - light goods vehicles (up to 7.5 t), heavy goods vehicles (over 7.5 t),

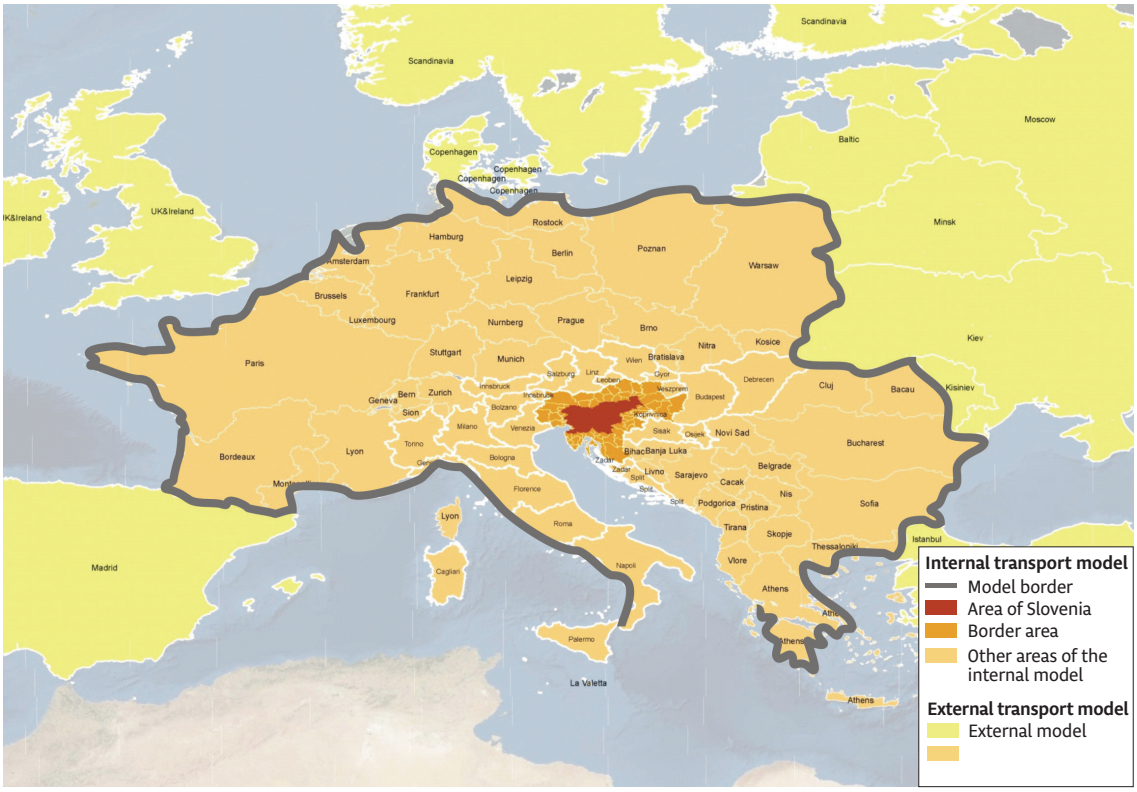


Figure 31.
Internal transport model: 827 zones (bordered with a thicker line); external transport model: 12 zones (marked yellow)

- transhipment points (including the Port of Koper);

- the rest of Central Europe:
  - trains,
  - heavy goods vehicles (over 7.5 t),
  - ships and ferries,
  - ports,
  - transhipment points.

3. the external passenger transport model

- the rest of Europe and the world:
  - private vehicles,
  - public passenger transport (trains),
  - airports and airline routes,

- ships and ferries,
- railway stations and stops,
- transfer points.

4.the external goods transport model
- the rest of Europe and the world:
  - trains,
  - heavy goods vehicles (over 7.5 t),
  - ships and ferries,
  - ports,
  - transhipment points.

Based on the demand for passenger and goods transport in the internal transport model, which includes the production and attraction of trips and transport, their distribution and mode choice, and the demand for external transport, common passenger and goods flows are determined, which are arranged according to means of transport and their combinations.

18: Revealed preference survey in households, survey of travel habits of Ljubljana Region residents, PNZ, Ninamedia, URBI, 2003.

4.3.2.3 Modeling area

The core of the national transport model consists of the traffic conditions in Slovenia. However, external factors also affect traffic conditions in the country. Therefore, the modelling area does not consist of the territory of Slovenia only, but a wider area, which is particularly important for modelling goods transport.

As mentioned above, the internal transport model or the CETRA model encompasses the area extending from the Atlantic Ocean to the Black Sea, and from the Baltic to the Mediterranean. There are over 350 million people and around 150 million jobs in this area. Considering that we are mainly interested in the conditions in Slovenia, this area is dealt with in detail at the national level. As part of the national model, traffic outside Slovenia is dealt with only to the extent to which it influences conditions in Slovenia. Figure 31 shows the internal model area, i.e. the area modelled within this study (bordered with a thicker line).

The model is calibrated and validated in detail as per traffic conditions in Slovenia. Traffic conditions outside Slovenia are verified approximately; they are more precisely verified for the border area and less precisely the farther they are from Slovenia.

4.3.3 Demand for internal passenger transport

4.3.3.1 Slovenia

4.3.3.1.1 Demand model

$$\frac{O_2 - O_1}{(O_2 + O_1)/2} + \frac{P_2 - P_1}{(P_2 + P_1)/2} = \frac{(O_2 - O_1)(P_2 + P_1)}{(P_2 - P_1)(O_2 + O_1)}$$

Production for an average working day is calculated according to the method of homogeneous origin-destination groups. In the 13 characteristic origin-destination groups or purposes are included in an average working day: home–work, home–school (primary, secondary, university), home–shop, home–leisure, home–other, work–home, school–home, shop–home, leisure–home, other–home, work–other, other–work and other–other.

The generation factors used were taken from surveys of Slovenian households[18].

In addition to the generation factors, socio-economic data by zones also constitute the basis for

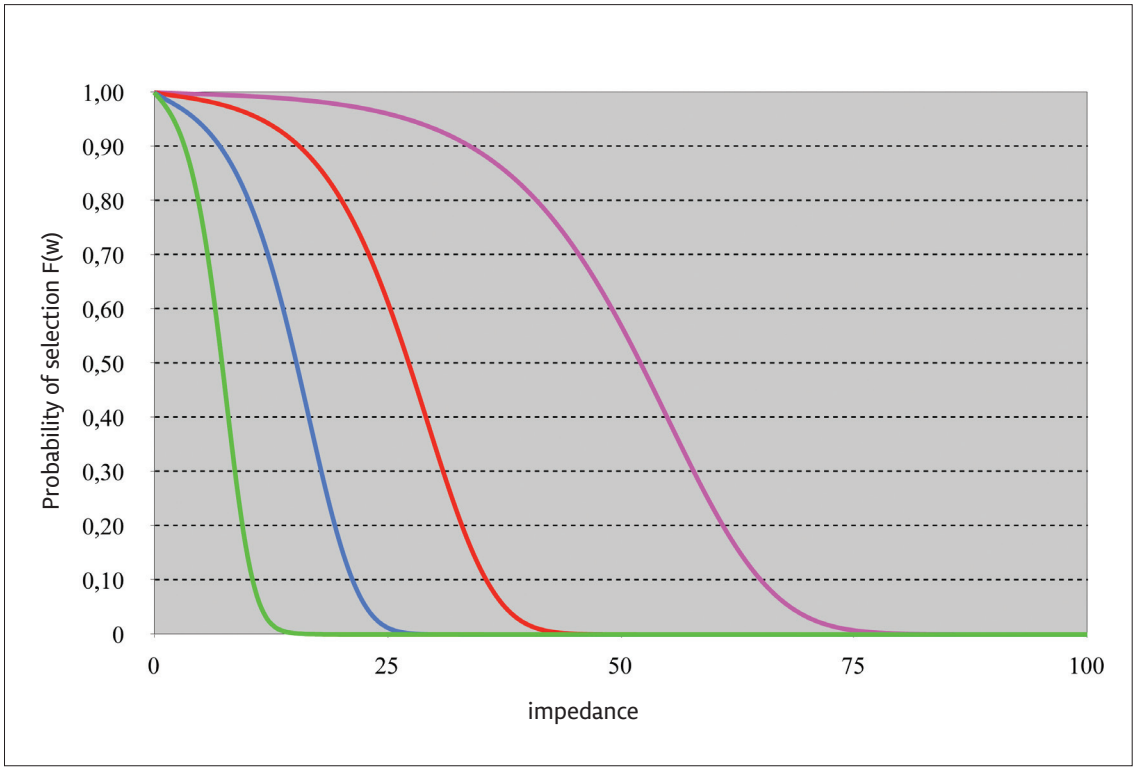
calculating generations, i.e. number of residents, employees, schoolchildren, secondary school students and university students, and whether or not they own a passenger vehicle.

Work- and school-related trips have hard boundary conditions (limited twice), while other purposes have soft boundary conditions (limited once). This means that the attraction of the latter depends on the benefits of the transport position and accessibility.

In the first step, attraction is determined in relation to all jobs, jobs in the tertiary sector, enrolments, floor areas of sales areas and residents.

The change in trip generation depends on growth in mobility (all trips/person/day) and the motorisation rate. Growth in mobility depends on GDP growth and is calculated with the equation:

Figure 32.
Probability impedance functions for various means of transport



Mi = η * BDPi,

whereby:
Mi ... mobility growth factor in area i,
BDPi ... gross domestic product growth factor in area i,
η elasticity factor.

The elasticity coefficient is calculated according to the method of medium arc elasticity, which is most frequently used for transport analyses.

The equation is as follows:

η = (difference Q quantity in %) ÷ (difference of the P price in %).

Medium (or linear) arc elasticity:

η =

whereby:

η elasticity value,
Q1 demand before,
Q2 demand after,
P1 price or services before,
P2 price or services after.

A special model was developed to calculate the motorisation rate.

Changes in the socio-economic characteristics of individual traffic zones also affect production and attraction.

Distribution and mode choice are determined with the EVA simultaneous model. These are probability impedance functions which differ for various origin-destination groups, various means of transport and various types of impedance. These functions (in addition to attractions) determine which destination will be selected with a certain means of transport at the same time.

Probability impedance functions usually include travel time. Special functions are added to this model, i.e. the function sensitive to the availability of car parks and the function sensitive to the frequency of trips of public passenger transport vehicles. Thus a means of transport is selected more credibly, since it takes into account all of the most influential factors.

Travel time is a generalised cost or generalised time. A key element affecting mode choice and destination is the cost of travel. The latter is expressed in a monetary (as generalised cost) or time (as generalised time) unit. In both cases, they consist of monetary and non-monetary costs. For the conversion of monetary or time costs into either money or time, it is necessary to know the value of time in view of the purpose of a trip. The value of time is different for various passenger categories. People for whom time is important are willing to pay more to arrive sooner, while people for whom time is less important are more sensitive to ticket prices or parking fees. With a rise in the standard of living, time becomes increasingly important, while price sensitivity declines.

In the CETRA and PRIMOS models, the values of time applicable to the situation in Slovenia are used for Slovenia. Generalised time used in this model represents the attractiveness of a means of transport and a route, and includes all of the important impedance elements, i.e.:

- private vehicles:
  - monetary costs: fuel and vehicle maintenance costs, tolls,
  - travel time: travelling to and from a car park (walking time), travel time spent in the vehicle, stop at a border;
- public passenger transport:
  - monetary costs: price of a ticket,
  - travel time: travelling to and from a station or a stop (walking time), waiting time at a station or a stop, time spent on embarking, time spent on transferring and travel time spent in the vehicle, stop at a border,
- level of discomfort due to crowding in public transport vehicles.

The generalised time used is comprised of all the aforementioned elements. Time is not determined mathematically, but in a way in which people perceive and feel it (perceived time), e.g. waiting time is perceived less comfortably than the same amount of travel time.

The availability of car parks and the cost of parking are modelled separately with a special function as elements of the impedance function.

As shown in the sub-chapter 'Structure of the model', the park and ride system (P+R) is a special mode of transport in Slovenia, which is also modelled separately.

Impedance function sensitive to the availability of general car parks

The availability of car parks, which also includes the cost of parking, is taken into account. The number of available parking spaces and the average cost of parking by traffic zones are also taken into account.

The average cost of parking by traffic zones is calculated on the basis of a survey of all the parking spaces available in the five biggest Slovenian towns. In the transport model, car parks are divided into three basic groups:

- public non-payable,
- public payable (parking platform, multi-storey car park, street parking, P+R car parks),
- private vehicle parks (business and reserved for residents).

The value of the variable 'average cost of parking' comprises two components: the availability of a car park (number of parking spaces) and the actual cost of parking according to the type of car park and duration of parking.

Work- and university-related parking takes into account the actual costs of eight-hour parking at payable car parks, and the number of parking spaces at non-payable and private vehicle parks. Other purposes take into account the actual cost of one-hour parking, the number of parking spaces at payable car parks, and the number of parking spaces on other public surfaces. A weighted average equation is used.

19: Matrix convolution is the procedure whereby a minimum of two travel times (one for car and one public transport) is calculated with help of a transfer point matrix in order to obtain the matrix of shortest travel times for the P+R system.

Impedance function sensitive to the frequency of public transport services

Impedance function sensitive to the frequency of public transport services

In addition to the function sensitive to the availability of car parks, a special function sensitive to the frequency of public transport services is also included. Thus the quality of the public transport offer, in addition to travel time, includes the frequency of service. It is not irrelevant whether three trains are available per day or per hour.

The parameters of the EVA 2 function, which is the mathematical basis for the calculation, are determined on the basis of a stated preference survey.

Parameters differ according to the purpose of a trip. Parameters for the whole of Slovenia are determined for two basic purposes:

- purpose 1 – trips to work and school;
- purpose 2 – trips for other purposes (shopping, leisure, etc).

In general, potential users of public transport who travel for other purposes are more sensitive to the frequency of service than people travelling to work or school. In both cases, the attractiveness of public transport is greatly reduced if the interval between trains is over two hours. Thus the probability of using public transport is less than 10%. The impedance function used here applies to interurban and suburban transport.

Through the two additional functions, all essential elements of the offer of private vehicle and public transport are included in the model. Thus the model became a tool suitable for testing various transport policies.

20: Source (1).

21: Survey in households in the Republic of Slovenia, Slovenian Roads Agency, 1999/2000.

Modelling the P+R system

The purpose of the P+R system is to shorten the duration of trips by passenger vehicle,

reduce the number of cars in city centres, and optimise transport costs, thereby enhancing the development of public passenger transport. This is a combination of travel whereby part of the trip is performed by car and part by public transport. The order is not important, but the use of both transport modes is implicit.

An additional probability impedance function is included in modelling the P+R system. In the first step, the impedance matrix for the P+R system is determined with the convolution matrix procedure[19]. The impedance matrix is determined on the basis of two impedance matrices, i.e. of passenger cars and public transport. Based on the locations of all car parks in the P+R system, the most favourable location for transfer between two transport modes is determined for an individual origin-destination pair, which is followed by a simultaneous process of distribution and mode choice (EVA model) which results in trip matrices by purpose and transport modes. The trip matrix of the P+R system is divided on the basis of the matrix of the most favourable transfer location and added to the trip matrix carried out separately by passenger car and by public passenger transport.

4.3.3.1.2 Motorisation model

Based on numerous statistical surveys and surveys at home and abroad, it was established that the motorisation rate directly affects residents' mobility and mode choice. Therefore, a motorisation model that facilitates credible forecasts of the motorisation rate is very important for determining future mobility and mode choice. Higher motorisation rates result in more trips per capita, particularly for non-working purposes, as well as in the increased use of passenger vehicles and reduced use of public transport.

A detailed analysis established that the so-called logit model or ordered logit model corresponds at the national level.

An organised logit motorisation model was developed:
- for households and
- for persons.

The variables and sub-variables are derived from a survey of households in 2003 for the wider Ljubljana Region[20]. One variable is, for example, age, while sub-variables are various age groups. A national survey in households between 1999 and 2001 was also analysed[21].

At household level, four potential probabilities are addressed:
- a household without a car,
- a household with one car,
- a household with two cars,
- a household with three or more cars.

For persons, two possibilities are addressed:
- a person has a car, and
- a person does not have a car.

The significance of independent variables is representatively determined at the level of the wider Ljubljana region, i.e. separately for the area of the Municipality of Ljubljana and for other areas in the region. Statistical reliability is determined with a linear hypothesis test. Thus, the determined independent variables are components of the motorisation model of Slovenia.

4.3.3.2 Remaining Central European area

4.3.3.2.1 Demand model

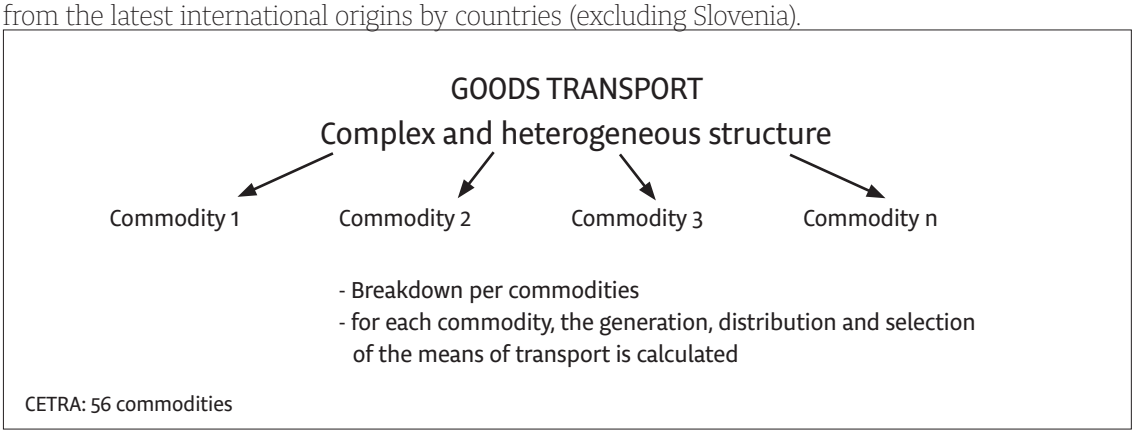
A unified demand model has been developed for the entire area included in the internal transport model. This model is more detailed only for Slovenia, while it is more approximate

for the other 22 relevant countries, since we are interested particularly in transport outside Slovenia which may affect traffic conditions in Slovenia.

Production is also calculated according to the method of origin-destination groups. However, we are interested merely in interzonal transport, not in intrazonal. Generation factors by countries are determined on the basis of international and national surveys in households. The share of interzonal transport is determined on the basis of international surveys.

The change in trip generation is determined on the basis of the growth in mobility, gross domestic product and motorisation rate. Expected GDP growth and the motorisation rate is summarised from the latest international origins by countries (excluding Slovenia).

Figure 33.
The commodity model is divided into commodities modelled separately



Distribution and mode choice are determined with the EVA simultaneous model. Special functions of EVA which differ from Slovenian functions have been developed for this area, which mainly includes long-distance transport.

Probability impedance functions include travel time, i.e. generalised time, which encompasses non-monetary and monetary costs, similarly to the Slovenian model. However, it does not encompass additional functions sensitive to the availability of car parks and the frequency of public transport services. The P+R system is also not included in this area.

As mentioned above, a model has been developed for the area of the remaining 22 countries, which realistically affects only traffic conditions in Slovenia. Within this model, we are interested only in this area.

The CETRA and PRIMOS transport models constitute the Slovenian national model, which encompasses more detailed impacts of the immediate environment. This has a significant impact on the precision and reliability of modelling goods flows.

This model will definitely provide the discussed area with significantly more credible, precise and reliable results than the current TRANS-TOOLS pan-European model, which considerably deviates from the actual conditions in Central Europe.

4.3.3.2.2 Motorisation model

The growth in the motorisation rate for 22 countries will be summarised from the latest international forecasts based on the recent forecasts of gross domestic product and other factors. In the demand model, the motorisation rate will be taken into account similarly as in the Slovenian model and will also affect mobility and mode choice.

Table 3.4:
Logistics systems

Commodity model

Commodities

The commodity model is multi-layered and heterogeneous.

The point of this model is that it is divided into commodities, and that generation, distribution and mode choice are calculated separately for each commodity. The CETRA model includes 56 commodities, each of them being treated separately in the demand phase, since each commodity is characterised by its own features, which differ from others.

The more commodities that are included, the more accurate and close to reality the model is. Major differences between commodities appear particularly in the distribution phase.

All 56 commodities are included in nine economic categories. The list of commodities includes all goods relevant to Slovenian goods transport and transport between other European countries which may affect transport conditions in Slovenia.

b. Logistics systems

Logistics systems are categories with similar requirements regarding the commodity model, which is shown in the use of similar means of transport and similar handling costs.

Logistics systems are usually divided into:
- bulk goods,
- containers,
- goods in bags,
- liquids,
- perishable goods, etc.

Mode and route choices largely depend on transport costs. Commodities with similar features in terms of physical characteristics and the possibility of transport are attributed to certain logistics systems and types of costs. Various transport costs are determined for logistics systems, as shown in Table 3.4.

Logistics system	Definition
Liquid: crude oil	Crude oil transport
Liquid: oil products	Transport of oil products (e.g. oil)
Liquid: food	Transport of liquid foodstuffs
Bulk goods: raw material	Transport of dry, bulk material in large quantities (e.g. iron ore)
Bulk goods: building materials	Transport of bulk building materials (e.g. gravel)
Bulk goods: food and fodder	Transport of dry, bulk material and foodstuffs (e.g. cereals)
Goods in bags	Transport of goods in large and small bags
Containers	Transport of goods in containers (e.g. consumer goods)
Special goods vehicles	Transport of goods requiring special vehicles (e.g. machines)
Fresh food	Transport of perishable foodstuffs
Natural gas	Natural gas transport

c. Steps of the commodity model

The modelling procedure has five steps:

1. generation of goods transport expressed in quantities per traffic zone (t/year);
2. distribution of goods transport expressed as a flow between traffic zones (t/year);
3. mode choice expressed as a flow between traffic zones by certain transport modes (t/year);
4. conversion to vehicles expressed as transport between traffic zones by transport modes;
5. assignment expressed as transport by traffic sections (including empty runs).

In the first three steps, transport is calculated per year, and in the last two steps, per working day or peak hour.

Individual steps are modelled consecutively, but reverse effects iteratively affect previous steps.

d. Generation

The first step of the demand calculation is a calculation of quantities of transport generated in each zone and each category. This is carried out for production and consumption. The basic assumption is that the sum of the quantity of transport generated at origin in a certain country is the same as the sum of transport generated at destination; whereby, quantities at origin are composed of local production and imports, while at destination, they are composed of local consumption and exports.

Based on the type of commodity, and considering whether local production and consumption may be calculated, the decisive use of land is determined by:

- population (rural/urban),
- production capacities,
- employees by sectors.

At the level of countries and the entire area of the internal model, local production and imports must equal local consumption and exports. Quantities at origin (production) and at destination of transport (attraction) are calculated for each of 56 commodities. If local consumption exceeds local production, importation is required. If local consumption is lower than production, the surplus is exported. Of course, the actual conditions are also taken into account, since a certain amount may be exported even if consumption exceeds production, etc.

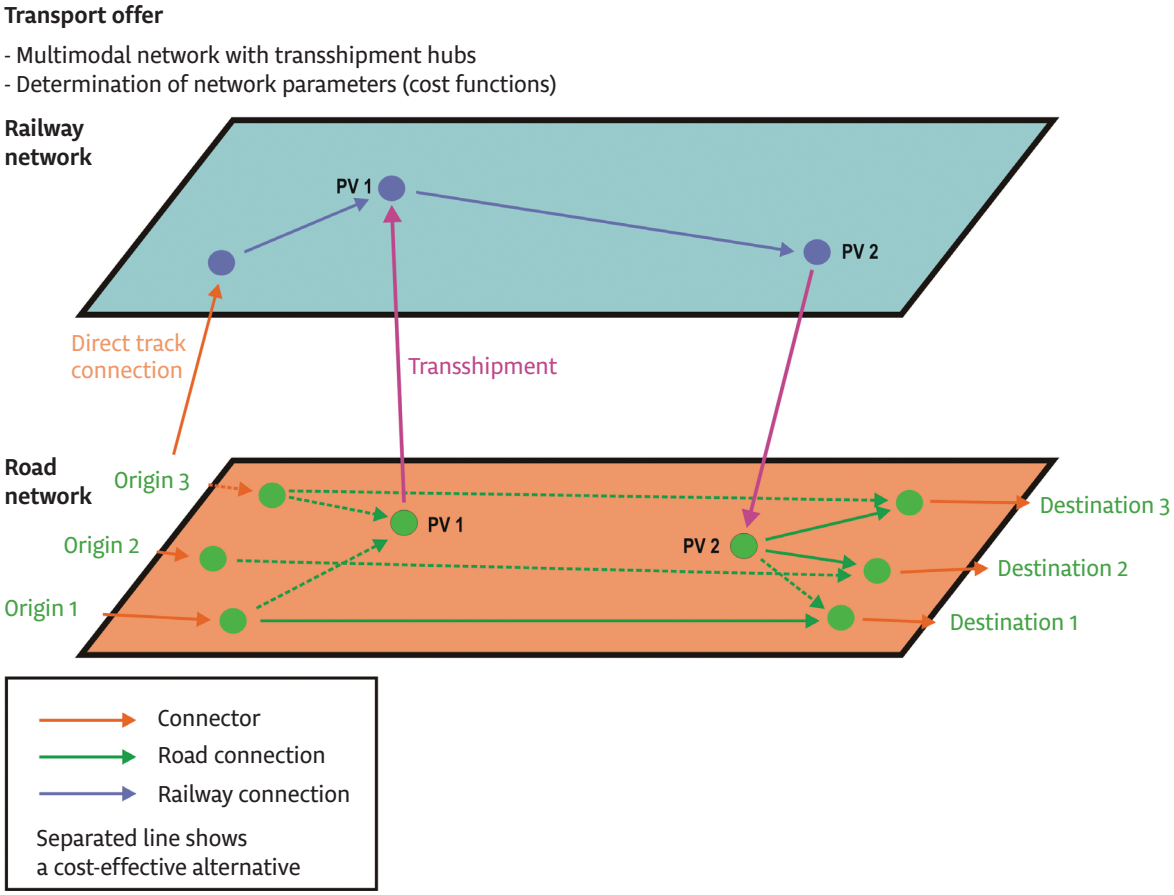
In the calculation of generation, the production procedure is taken into account, e.g. the excavation of limestone is followed by the production of slag, which is then followed by the production of cement, etc.

e. Distribution

Similarly to generation, distribution is calculated separately for each commodity. Distribution is calculated with the gravitation model, which distributes transport quantities between origin and destination zones. The result is the flow between traffic zones in tonnes per year.
Distribution is calculated in two steps:

1. calculation of skim matrices based on impedance between traffic zones;
2. calculation of matrices of commodity flows (expressed as flow in tonnes per year) based on skim

Figure 34.
Calculation of the selection of transport of goods traffic



matrices, and origin and destination quantities.

The cost matrix expressed in monetary terms is used as the impedance matrix. The matrix values expressed in EUR are calculated with the impedance function.

Thus the origin-destination matrix of commodity flows expressed in net tonnes per year is calculated for each commodity.

Synthetically, distribution is calculated only for transport in Slovenia. Future distribution for origin-destination and transit transport (in relation to Slovenia) is based on current distribution. Past experience with commodity models of long-distance flow distribution shows that synthetic models describe the actual situation poorly and achieve a very poor mutual co-dependence in respect of the actual situation. Therefore, the synthetic model is not used to determine distribution for the origin-destination and transit transport of goods.

The existing distribution was obtained on the basis of Eurostat and SURS statistics, and data from the north Adriatic ports. According to a special key that depends on all jobs and residents, and especially on jobs in agriculture, construction and industry, these flows are divided by commodities into levels of traffic zones.

This means that potential future changes in the distribution of origin-destination and transit flows depend only on changes in generation, not on changes in the impedance matrix. However, changes in the impedance matrix will affect mode and route choice. Since Slovenia and other countries have established trade in goods with all of the other 22 countries, potential future changes will perhaps be adequately taken into account.

As noted above, transport quantity generated at origin and at destination of transport is expressed in tonnes per year. The same unit is used for distribution and the expression of commodity flow between traffic zones.

f. Mode choice

Similarly to generation and distribution, mode choice is determined separately for each of the 56 commodities.

Mode choice or a combination of modes is determined on the basis of multimodal network assignment with individual commodities. A route and a transport mode based on a generalised cost are selected at the same time.

Generalised cost and generalised time include monetary and non-monetary costs for road, rail and ship transport, and the logistics system. Therefore, it includes costs related to time, distance travelled and logistics tasks.

Costs in the model are determined as:

- time-related costs: costs in relation to the transport modes and the loss of the value of goods according to the commodity;
- distance-related costs: costs in relation to the transport modes;
- logistics costs: costs of loading/unloading and transhipment.

Transport costs are attributed to traffic sections on the network. The following is taken into account when using transport modes:

- link attributes: permitted use of transport modes and transfer sections;
- logistics system and allocation of commodities.

For each commodity, the multimodal network is assigned according to an iterative balance procedure with flow matrices expressed in tonnes. The result is the most cost-effective route and transport mode for each origin-destination pair.

Costs thus consist of costs that depend on the distance travelled, travel time and transhipment activities. The most favourable combination of transport modes is then selected.

g. Conversion to vehicles

Traffic flows of commodities expressed in tonnes per year are calculated in transport per day or hour, whereby the average load of individual types of vehicles, empty runs and the logistics system are taken into account.

The results of this procedure are trip matrices by transport modes on a working day or at a selected time/hour.

4.3.5 Demand for external transport

The forecast of external transport is based on the forecast of a four-step model, i.e. on the TRANS-TOOLS pan-European model which in Slovenia is partially adjusted to Slovenia's specific conditions. The ArcGIS, Traffic Analyst 2.0 tool was used.

In the final step, the matrices of internal and external transport are combined into unified matrices by transport modes and units of assignment.

Such matrices of external and internal transport constitute the basis for network assignment in a base year. The pivot point method was used for forecasting, which takes into account changes in individual origin-destination pairs of external transport.

Combining the internal and external model

The demand model of external passenger and goods transport is designed with the use of the ArcGIS, Traffic Analyst 2.0 tool. The final assignment of the network is designed with the use of the VISUM tool. Thus networks may be assigned with combined matrices of internal and external transport.

4.3.6 Assignment

Road transport assignment is determined with a multimodal model according to the learning process stochastic method. Personal motor vehicle and goods transport are also assigned. The BPR function volume-delay, which differs between various road categories, is taken into account. Bicycle and pedestrian traffic are assigned with the same model, while public passenger transport is assigned with an intermodal model according to the timetable method. Goods transport is also assigned with an intermodal model which includes all the relevant transport modes and transhipment points.

Assignment is carried out according to the static method, which corresponds to the level of the national model.

The assignment model also includes road and public transport capacity limitations based on which saturation and congestion on the road network and crowding in public transport vehicles are determined. All of the above affects the demand for zones, mode choice and the distribution of traffic on the road and public transport network.

In the stochastic assignment procedure, the most favourable route is usually selected, but the fact that individuals are incompletely and differently informed of traffic conditions and the costs of competitive routes is also taken into account, which is closer to reality. Thus traffic is distributed on the network more realistically.

Road toll collection is included in generalised travel time. The price of tolls by type of vehicle is converted into generalised time, taking into account the value of time according to the purpose of a trip.

Road toll collection also affects mode and route choice.

As noted above, the impact of parking policy is integrated in the demand model through a special function, and affects mode and destination choice.

At the same time, rail, ship and ferry goods transport are also assigned on the basis of the generalised price. The result of goods transport assignment is similar to that of passenger transport, and is expressed as the number of light and heavy goods vehicles on the road, the number of trains with a certain structure and the number of ships of a certain type. All are expressed in terms of vehicles per working day by traffic sections.

4.3.7 Environmental impacts and traffic safety

Sub-models for the calculation of air pollution, noise emissions and road accidents have also been developed within the transport model.

Air pollution for road transport is calculated on the basis of the HBEFA emission factors, which

are prepared for European conditions by the Swiss company Infras. Various factors are used for various types of vehicle – i.e. separately for diesel and petrol engines – for various EURO emission standards. Fuel consumption is also calculated.

Also calculated are emissions of gas affecting global climate change: CO2, CH4, N2O, and emissions which affect local conditions: NOx, SO2, PM2,5, several components of HC and others.

The calculation of gas emissions is a module included in the VISUM tool; therefore, the calculation of emissions may be carried out directly with this tool.

Noise emissions for roads and railways are calculated on the basis of traffic assignment on a working day for the Lden indicator (day, evening, night), which includes motorways, expressways, state roads and railway.

22: TREND-forecast 2004, Eurostat.

An analytical model for forecasting road accidents has been developed for road transport. Sub-models and their parameters which facilitate the calculation of future accidents have been developed for individual regions in the country and various road categories on the basis of data on past accidents, traffic assignments and traffic structure. The model for forecasting road accidents is integrated in the transport model.

4.3.8 Bases for transport forecasting

23: Population prospects, 2006 revision, UN population division.

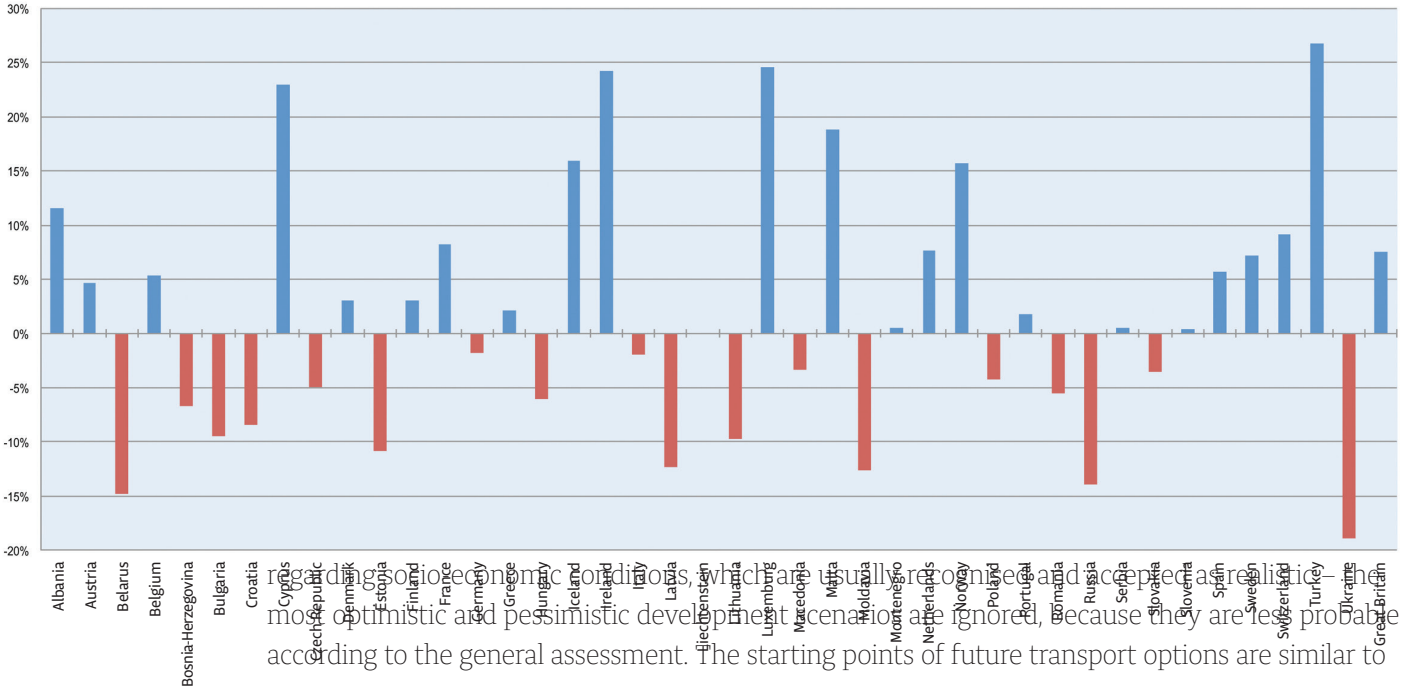
4.3.8.1 Introduction

Transport forecasting depends on reasons for transport, which may be either external or internal, or policy factors.

External factors are: the number and age structure of the population, the motorisation rate, the settlement pattern, employment, gross domestic product growth, the number of jobs and their structure in the area, domestic and international trade, and domestic and international tourism.

Furthermore, transport forecasting is also influenced by the anticipated transhipment rate in the ports of Koper, Trieste and Rijeka, and the expected future number of passengers transported at Ljubljana Jože Pučnik Airport.

Figure 35.
Increase and decrease in population by states in the 2005–2030 period



regarding socioeconomic conditions, which are usually recognised and accepted as realistic – the most optimistic and pessimistic development scenarios are ignored, because they are less probable according to the general assessment. The starting points of future transport options are similar to

those in previously drafted European studies.

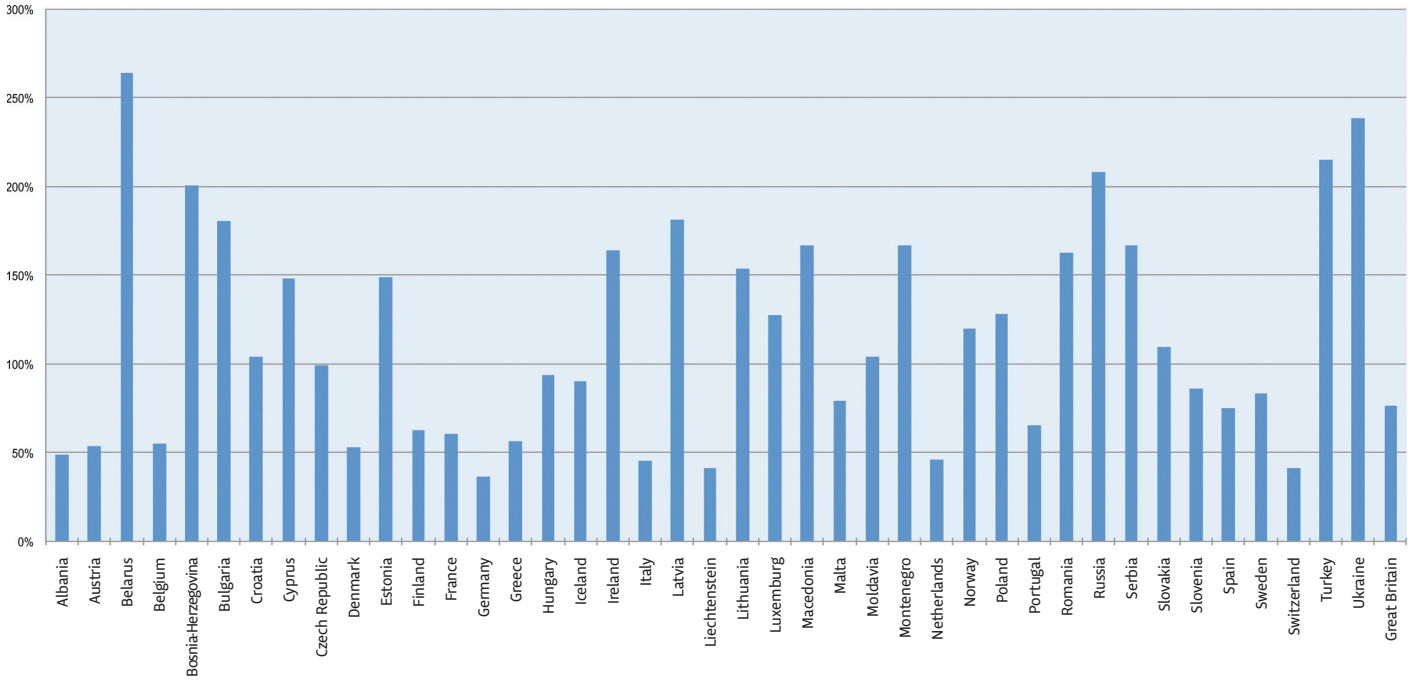
24: Long-term labour productivity and GDP projections for the EU-25 Member States, European Kommission, Directorate-General for Economics and Financial Affairs, No. 253, 2006.

4.3.3.2 Development of socio-economic conditions in Central Europe

Demand forecasting within the four- or five-step transport model is based primarily on future European socio-economic conditions.

Transport forecasting for Central Europe and Slovenia has been prepared for 2020 and 2030.

Figure 36.
GDP growth per capita by states in the 2005–2030 period



Population growth within the EU-27 is derived from the official Eurostat forecast at the NUTS[22] level. In 2005, the European Union had 491 million residents. In 2020, there will be 496 million residents and approximately the same by 2030 (495 million). Thus the number of residents in the European Union will be approximately the same by 2030.

Table 3.5:
Socio-economic conditions in Europe, 2005

Within the EU-15, low growth in the number of residents (from 387 million to 399 million) is expected, while within the EU-12, a decline is expected (from 104 million in 2005 to 96 million in 2030). The highest population growth is expected in Ireland, Luxembourg and Cyprus, while the greatest decline is expected in Estonia, Latvia, Lithuania and Bulgaria. Outside the EU, population growth forecasts are derived from United Nations[23] forecasts. The highest population growth is expected in Turkey, while population will decline most significantly in Russia, Belarus and Ukraine.

Europe's population is ageing, and the age group of people over the age of 64 is becoming the dominant group. Therefore, the share of the active working population is declining and shifting to the inactive population. Within the EU-27, the age group of people over the age of 64 will comprise almost half of the population by 2030; there will be 14% fewer people below the age of 18 than in 2005, and the group of active working population (ages between 18 and 64) will have declined by 7%.

A smaller active working population also means fewer workers, one of Europe's future problems.

Figure 35 shows that population growth by 2030 is particularly expected in more developed countries. The active working population is expected to grow only in Cyprus, Ireland, Luxembourg, Malta and Sweden.

Economic development by 2030 is estimated on the basis of Report no. 253 prepared by the Directorate-General for Economics and Financial Affairs[24] in 2006. Economic development expressed in gross domestic product (GDP) per capita will be faster in Eastern Europe and slower in Western Europe. Such a development was also noted in the past. Within the EU-15, GDP per capita amounted to approximately EUR 24,000 in 2005, and is expected to increase by 2030 to approximately EUR 37,000 (expressed in fixed prices). Within the EU-12, GDP per capita amounted to approximately EUR 5,000 in 2005, and is expected to increase to EUR 13,000 by 2030. The ratio in the value of GDP per capita between the two areas is expected to decline from 4.7 to 2.9.

Regarding tourist accommodation capacities, only beds in hotels have been taken into account. In 2005, France (over 10 million beds) and Italy (over 7 million beds) had the largest tourist accommodation capacities. Since no data were available on future tourist accommodation capacities, the future situation also took into account existing tourist accommodation capacities.

The tables below show the development of the basic socio-economic indicators for 42 European countries that are used in transport forecasting.

Country	Population	Jobs	Beds in hotels	GDP (in € million)	GDP (in € million)/per capita	Motorisation
Albania	3,135,000	925,998	80,727	6,582	2,099	58
Austria	8,236,100	3,734,414	1,280,779	245,330	29,787	499
Belarus	9,800,300	4,379,997	252,363	24,265	2,476	181
Belgium	10,478,100	4,071,241	684,692	301,966	28,819	481
Bosnia and Herzeg.	3,842,600	1,149,996	98,946	8,655	2,252	117
Bulgaria	7,739,600	2,800,457	241,335	21,883	2,827	330
Croatia	4,443,500	1,582,989	794,809	31,260	7,035	312
Cyprus	757,800	315,320	99,520	13,659	18,025	472
Czech Republic	10,235,800	4,762,860	634,266	100,320	9,801	385
Denmark	5,419,300	2,740,510	711,596	207,756	38,336	369
Estonia	1,346,200	581,180	50,948	11,209	8,327	319
Finland	5,246,300	2,406,429	923,757	157,162	29,957	436
Country	**Population**	**Jobs**	**Beds in hotels**	**GDP (in € million)**	**GDP (in € million)/per capita**	**Motorisation**
France	62,444,000	23,885,124	10,100,328	1,688,712	27,044	453
Germany	82,468,300	35,715,046	5,228,689	2,244,522	27,217	537
Greece	11,104,000	3,948,892	873,170	198,609	17,886	380
Hungary	10,087,100	3,845,899	259,740	88,914	8,815	289
Iceland	296,700	155,000	16,639	13,084	44,097	563
Ireland	4,159,200	1,749,839	265,601	161,498	38,829	368
Italy	58,607,300	21,756,762	7,450,847	1,423,048	24,281	568
Latvia	2,300,600	996,486	47,389	13,012	5,656	245
Liechtenstein	34,800	17,000	1,189	2,941	84,511	688
Lithuania	3,414,100	1,420,820	42,568	20,673	6,055	387
Luxembourg	457,300	188,230	118,571	30,032	65,673	656
Macedonia	2,035,200	544,999	52,406	4,676	2,298	124
Malta	403,500	196,000	38,016	4,756	11,787	636
Moldova	3,600,400	1,050,000	92,713	2,399	666	81

Table 3.6: Socio-economic conditions in Europe, 2030

Source: TEN-Connect: Traffic flow: Scenario, Traffic Forecast and Analysis of Traffic on TEN-T, DG TREN, 2009.

Montenegro	623,000	196,378	16,042	1,815	2,913	191
Netherlands	16,319,800	8,176,416	2,187,253	508,964	31,187	401
Norway	4,623,200	2,293,198	830,826	242,935	52,547	413
Poland	38,165,100	13,550,976	982,757	244,420	6,404	337
Portugal	10,549,400	5,132,719	718,744	149,010	14,125	298
Romania	21,634,300	9,767,548	349,868	79,587	3,679	168
Russia	143,474,200	67,133,985	3,694,562	614,410	4,282	177
Serbia	9,497,200	2,498,617	249,925	23,093	2,432	156
Slovakia	5,386,900	2,111,110	253,544	38,480	7,143	236
Slovenia	2,000,400	922,379	51,507	28,252	14,123	479
Spain	43,398,600	16,240,669	4,563,328	908,450	20,933	438
Sweden	9,029,500	4,347,850	766,580	294,674	32,635	436
Switzerland	7,437,300	3,959,170	945,510	299,472	40,266	485
Turkey	72,064,800	21,790,993	3,307,972	290,503	4,031	80
Ukraine	47,100,600	21,377,988	1,212,866	69,085	1,467	118
Great Britain	59,880,200	28,338,276	3,434,965	1,812,927	30,276	448
Sum, average	**803,277,600**	**332,759,760**	**54,007,853**	**12,632,999**	**15,727**	**329**

The motorisation rate will continue to grow, although at a slightly lower rate. Within the EU-15, the motorisation rate will rise from 483 private vehicles/1,000 residents in 2005 to 553 in 2020 and 594 in 2030. Within the EU-12, the motorisation rate will rise from 337 in 2005 to 402 in 2020 and 447 in 2030. The ownership of cars expressed in private vehicles/1,000 residents was estimated on the basis of a model in which car ownership also depends on growth in GDP. The motorisation model was developed within the scope of the TENconnect project.[25]

Country	Population	Jobs	Beds in hotels	GDP (in € million)	GDP (in € million)/per capita	
Motorisation						
Albania	3,497,719	1,033,136	80,727	9,787	2,798	61
Austria	8,622,222	3,910,118	1,280,779	377,521	43,785	616
Belarus	8,350,836	3,732,194	252,363	88,246	10,567	256
Belgium	11,040,516	4,287,085	684,692	469,287	42,506	595
Bosnia and Herz.	3,585,530	1,073,062	98,946	26,013	7,255	164
Bulgaria	7,006,899	2,554,162	241,335	61,376	8,759	467
Croatia	4,069,357	1,449,704	794,809	63,881	15,698	394
Cyprus	931,821	387,730	99,520	33,867	36,345	648
Czech Republic	9,730,457	4,530,863	634,266	200,028	20,557	495
Denmark	5,585,553	2,824,583	711,596	318,163	56,962	463
Country	**Population**	**Jobs**	**Beds in hotels**	**GDP (in € million)**	**GDP (in € million)/per capita**	**Motorisation**
Estonia	1,200,394	518,233	50,948	27,897	23,240	452
Finland	5,407,418	2,489,172	923,757	255,299	47,213	555
France	67,564,652	25,843,802	10,100,328	2,716,665	40,208	555
Germany	80,998,908	35,173,141	5,228,689	3,069,207	37,892	647
Greece	11,337,298	4,035,268	873,170	310,148	27,356	455
Hungary	9,477,947	3,629,323	259,740	172,201	18,169	371
Iceland	344,132	179,779	16,639	24,855	72,225	867
Ireland	5,167,568	2,168,767	265,601	425,882	82,414	569
Italy	57,472,116	21,403,102	7,450,847	2,064,614	35,924	690

Latvia	2,017,265	873,761	47,389	36,628	18,157	358
Liechtenstein	34,800	17,000	1,189	4,163	119,638	804
Lithuania	3,082,160	1,282,678	42,568	52,391	16,998	545
Luxembourg	569,866	234,564	118,571	68,278	119,813	784
Macedonia	1,967,225	526,796	52,406	12,466	6,337	160
Malta	479,594	232,963	38,016	8,521	17,766	764
Moldova	3,146,390	917,595	92,713	4,901	1,558	88
Montenegro	626,302	197,419	16,042	4,839	7,726	231
Netherlands	17,577,197	8,805,577	2,187,253	742,116	42,220	479
Norway	5,347,723	2,652,576	830,826	533,928	99,842	630
Poland	36,552,060	12,938,184	982,757	558,003	15,266	451
Portugal	10,732,068	5,210,654	718,744	246,864	23,002	363

16 Eurostat; EU.

Figure 37.
Number of population in Slovenia

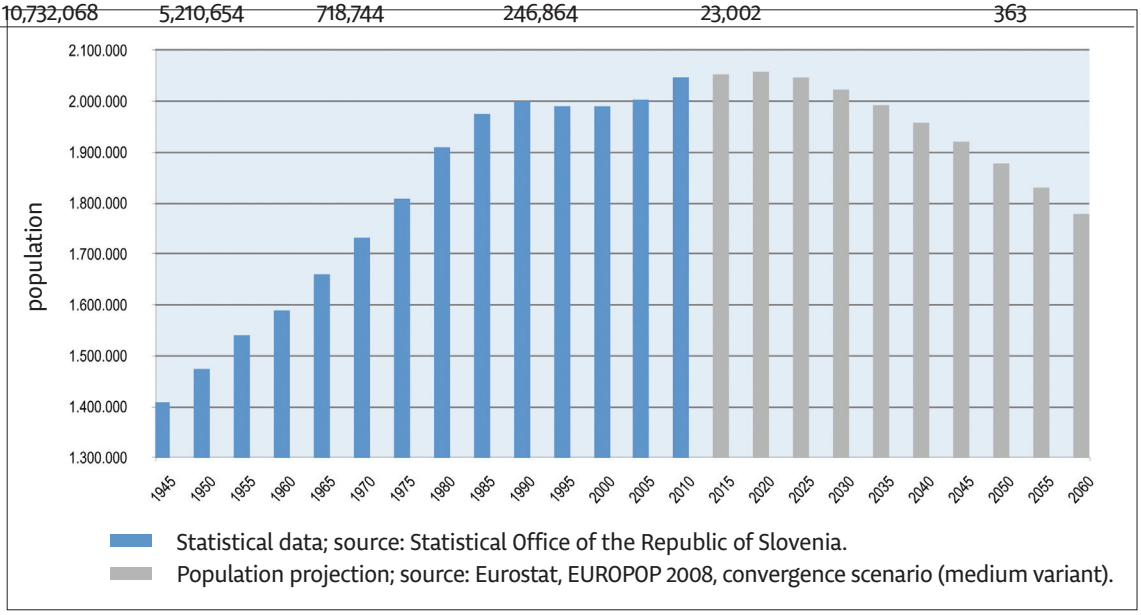
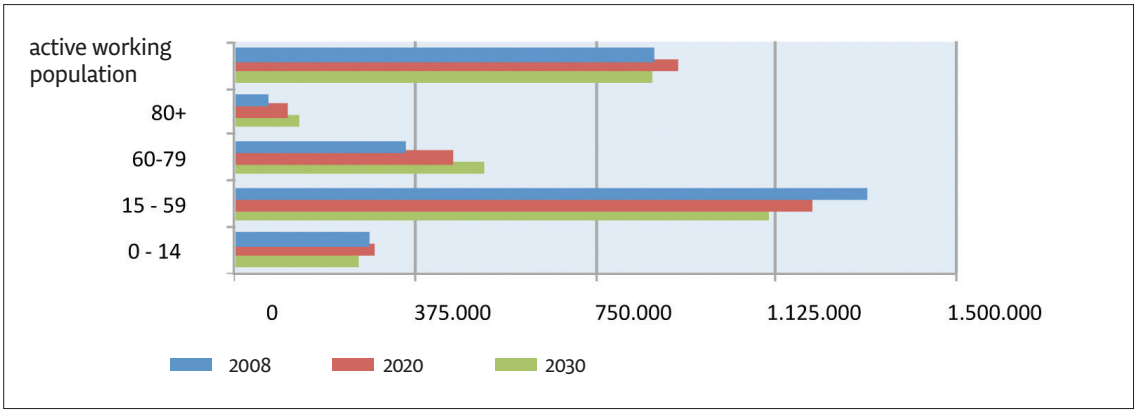


Figure 38.
Number of population by age groups and active working population

Source:
Slovenia Forest Service (EUROPOP)



Romania	20,440,990	9,186,957	349,868	209,012	10,225	225
Russia	123,502,591	57,788,932	3,694,562	1,891,255	15,313	251
Serbia	9,547,536	2,511,858	249,925	61,563	6,448	189
Slovakia	5,196,638	2,032,922	253,544	80,569	15,504	297
Slovenia	2,008,409	926,073	51,507	52,612	26,196	633
Spain	45,880,260	17,136,943	4,563,328	1,587,796	34,607	545
Sweden	9,682,340	4,665,364	766,580	540,948	55,870	583
Switzerland	8,118,519	4,321,808	945,510	423,941	52,219	567
Turkey	91,320,513	27,613,547	3,307,972	915,835	10,029	102
Ukraine	38,203,297	17,339,687	1,212,866	233,946	6,124	160
Great Britain	64,388,673	30,471,905	3,434,965	3,199,974	49,698	586

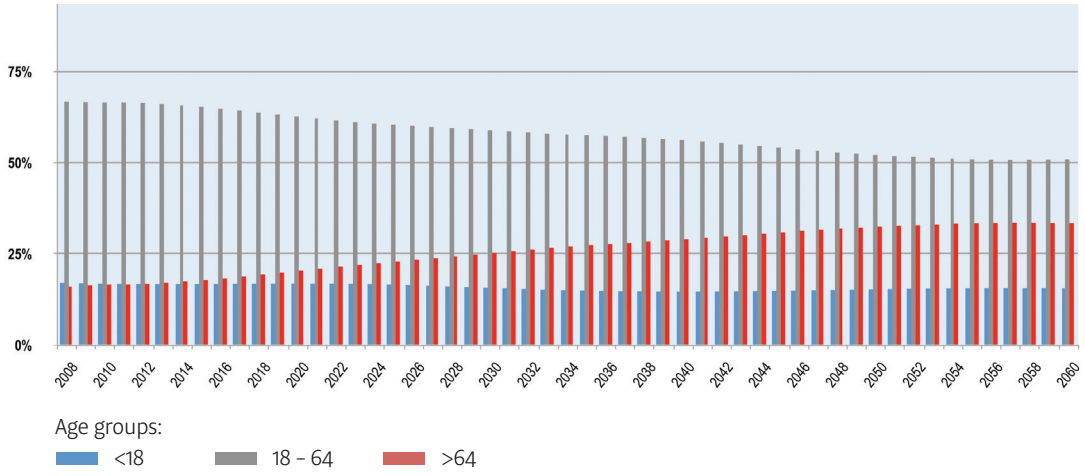
Average	**801,813,759**	**329,108,987**	**54,007,853**	**22,185,486**	**27,669**	**421**

In this context, Slovenia was considered in the same manner as other countries which were included in the global forecast of European socio-economic conditions. The data on jobs for Slovenia deviate from the actual data for 2005; therefore, the forecast of jobs for 2030 is too high. The forecast of GDP growth (for all countries) is also relatively high, as the crisis which slowed development in several countries has not been taken into account. Therefore, the forecast of the future motorisation rate for Slovenia is also too high.

The tables show that Europe will have approximately the same number of residents in 2030 as in 2005 (803,277,600 in 2005 and 801,813,759 in 2030). The number of jobs is expected to slightly decline. GDP per capita is expected to grow by 76% and the motorisation rate by 28%.

Figure 39.
Population projection for Slovenia by age groups, 2008–2060

Source: Eurostat, EUROPOP 2008, convergence scenario (medium variant).



4.3.8.3 Forecast of socio-economic conditions in Slovenia

The assessment of future socio-economic conditions in Slovenia is largely based on the forecast growth in population and its age structure published by Eurostat (Europop 2008 – medium variant)[26]. In addition to natural increase, this forecast also includes migration. National demographics experts of individual countries (also Slovenian) participated in preparing this forecast.

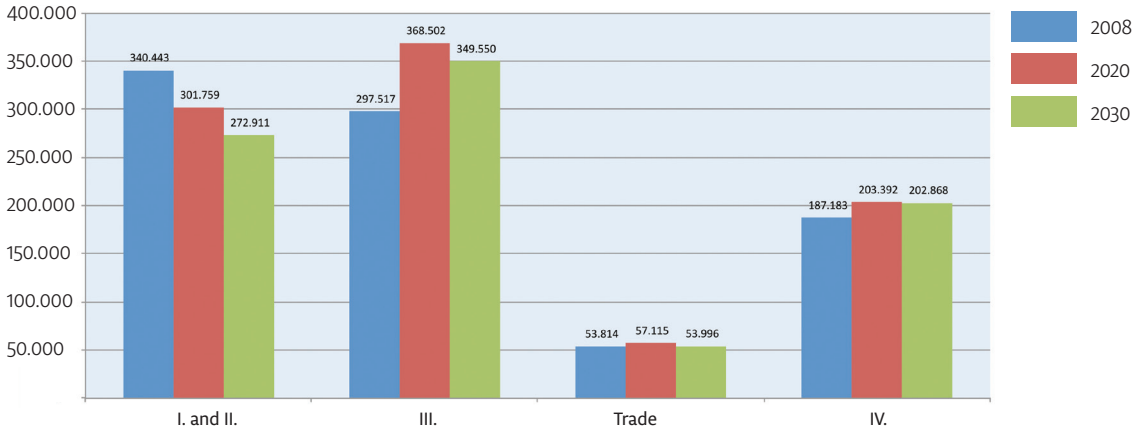
In 2011, Slovenia had 2,052,496 residents (permanently and temporarily registered).Eurostat's projection for 2020 and 2030 includes a forecast made separately for the cohesion regions of Eastern and Western Slovenia. As per the global forecast, projections are shown for the whole of Slovenia, while forecasts by traffic zones are based on forecasts for these two regions.

According to this forecast, 2,059,212 people will be living in Slovenia in 2020, which is almost the same as in 2011, and 2,022,751 in 2030, or 1.45% less than now. The number of the population in this period will not change significantly, but the age structure will change considerably, particularly of the active working population and the population above the age of 60. However, during a later period, e.g. by 2060, Slovenia will also experience a significant decline in population.

Some 280,967 or 13.7% of people were aged between 6 and 9 in 2011. There will be around 25,000 more in 2020 (304,934), and around 10,000 less in 2030 (270,013) than in 2011, which means that there will be fewer primary school children and secondary school students in 2030 than now.

As mentioned above, the active working population, i.e. aged between 20 and 59, will decrease significantly. This group comprised 1,216,309 people in 2011; in 2020, it will comprise 1,087,603, or 128,000 fewer than in 2011, while in 2030, it will only comprise 1,010,269 people or 206,000 fewer than

Figure 40.
Number of jobs by sectors in Slovenia



in 2011. The age group between 20 and 59 will decrease by 10.5% by 2020 and by 16.9% by 2030. This means that this age group will also comprise fewer employed people, which will be a problem for Slovenia in the future.

Some 431,503 people were older than 60 in 2011; this number will increase by 135,000 to 566,008 in 2020, and by 223,000 to 654,213 in 2030. The share of people older than 60 was 21.1% in 2011; this will increase to 27.5% in 2020 and 32.3% in 2030, which is almost a third of the population. Thus the share of older people is increasing.

The graph in Figure 39 shows that the group of active working population (grey) will continue to decline up to 2050, while the group of people over the age of 64 (red) will grow. The share of people below the age of 18 (blue) will also continue to decline up to 2050.

In the future, people will have to work longer; otherwise, the labour force will be insufficient. This will also be imposed on them by pension reform. Therefore, the forecast regarding employed persons takes into account the fact that people will on average work five years longer than now.

In 2011, there were 824,162 employed persons in Slovenia. If we take into account that the share of employed persons in the active working population group aged between 18 and 64 remains the same as the share prior to the crisis and that people will work five years longer in the future, there will be 921,707 employed persons in 2020 or 11.8% more than in 2011, and 868,307 in 2030 or some 5.4% more than in 2011. Therefore, the extended years of service will result in slightly more employed persons in 2030 compared to 2011.

This means that there will be approximately the same number of jobs in Slovenia in the future as prior to the crisis, since the number of jobs greatly depends on the number of employed persons and vice versa. There were 878,957 jobs in Slovenia in 2008 and 824,553 in 2011. If we take into account that the ratio between employed persons and jobs remains the same, there will be 930,768 jobs in Slovenia in 2020 or 5.9% jobs more, and 879,325 in 2030, which is almost the same as in 2008 and more than in 2011. Thus the change in the age structure of the population in the next twenty years will not result in fewer jobs due to longer years of service.

27: Long-term projection of gross domestic product growth in Slovenia, UMAR, 2009.

However, not all segments of employment will remain the same as in 2008 and 2011. Even until now, the number of jobs in the primary and secondary sectors has been declining, while the number in the tertiary and quaternary sectors has been rising. This trend will undoubtedly continue. Therefore, this process is taken into account in the assessment of the future increase in jobs by sectors, which also takes into account the future movement of all jobs, i.e. that the number of all jobs will decline after 2020.

After 2020, more rational employment and greater productivity will be required, as a smaller

labour force will be available, also in the tertiary and quaternary sectors. In these two sectors, more persons will be employed in 2030 than in 2008, but fewer than in 2020.

It is estimated that sales floor areas will increase minimally in the next twenty years. Saturation with retail outlets is already considerable, so greater shifts cannot be expected, except in terms of greater rationalisation.

The number of schoolchildren is determined by the age structure of the population by age groups. The number of enrolments will, naturally, follow demand. The number of primary school children and secondary school students will grow somewhat by 2020 compared to 2011, but decline by 2030, so there will be fewer students than now. Considering the fact that particularly secondary school students are among the main users of public transport, there will be less demand for this transport mode in the long term.

In 2011, approximately 100,000 beds in commercial holiday facilities and approximately 50,000 in private holiday facilities were available in Slovenia. The number of beds in private holiday facilities is not expected to change considerably, while the number of beds in commercial holiday facilities is expected to grow. There are no projections regarding future capacities of tourist facilities in Slovenia. However, the analysis of development so far shows that the number of beds in commercial holiday facilities has grown in the last decade at a rate of 2% annually. We assume that the number of beds will also grow in the future, i.e. by at least by 1.5% annually up to 2020 and by 1% annually after 2020. Based on this assumption, the number of beds in commercial holiday facilities will have grown by 19,000 by 2020 and by 31,000 by 2030. This means that approximately 128,000 beds in commercial holiday facilities and approximately 60,000 in private holiday facilities will be available in 2030, which is a total of 188,000.

Gross domestic product growth is summarised from long-term projections by UMAR[27] and Eurostat, and corrected for the period between 2009 and 2011. Gross domestic product per capita in Slovenia was EUR 17,688 in 2008; it will be EUR 21,143 in 2020 and EUR 24,863 in 2030. Purchasing power parity is significantly higher.

The motorisation rate is calculated with the motorisation model, which was developed for this project. The calculation is shown in Chapter 8. There were 523 private vehicles/1,000 residents in Slovenia in 2011, and there will be 568 private vehicles/1,000 residents by 2030. The motorisation rate will increase by an average of 14.3% by 2030. By then, the motorisation rate in Slovenia will be approximately the same as in Italy, France and Spain currently, and significantly lower than in Luxembourg (661) in 2006 or now in the USA (828).

Table 3.7:
Socio-economic data for developing a prognostic transport model at the national level for 2011, 2020 and 2030

Table 3.7 shows basic socio-economic data at the national level.

Indicator	Value by year		
	2011	2020	2030
Number of all registered residents	2,052,496	2,059,212	2,022,751
Number of employed (active working) residents	824,162	921,707	868,307
Share of active working residents	40.20%	44.76%	42.93%
Number of jobs in the primary sector	10,217	9,720	7,827
Number of jobs in the secondary sector	272,294	312,505	251,653
Number of jobs in the service sector	270,771	321,455	313,201
Number of jobs in commercial activities	50,561	56,973	53,869
Number of jobs in tourism activities	9,311	11,643	11,344
Number of jobs in recreational activities	17,250	22,480	21,903
Number of jobs in hospitality activities	14,038	15,387	17,235
Number of jobs in the quaternary sector	180,111	180,605	202,293

Number of all jobs	824,553	930,768	879,325
Sales floor areas (m²)	1,957,560	2,005,371	2,025,425
Number of persons aged between 6 and 14	182,045	192,132	170,123
Share of persons aged between 6 and 14	8.90%	9.30%	8.40%
Number of enrolments in primary schools	177,062	185,538	164,284
Number of persons aged between 15 and 19	98,922	112,813	99,890
Share of persons aged between 15 and 19	4.80%	5.50%	4.90%
Number of enrolments in secondary schools	97,254	107,058	94,794
Number of regularly enrolled students	76,777	76,159	74,810
Share of regularly enrolled students	3.70%	3.70%	3.70%
Number of enrolments in tertiary education	80,548	89,705	88,116
Commercial and private tourist accommodation capacities (number of beds)	150,000	175,000	188,000
Gross domestic product per capita expressed as purchasing power parity (EUR)	EUR 21,000	EUR 25,102	EUR 29,518
Motorisation rate (private vehicles/1,000 residents)	523	568	598

Table 9.8: Projection of average annual GDP growth rates

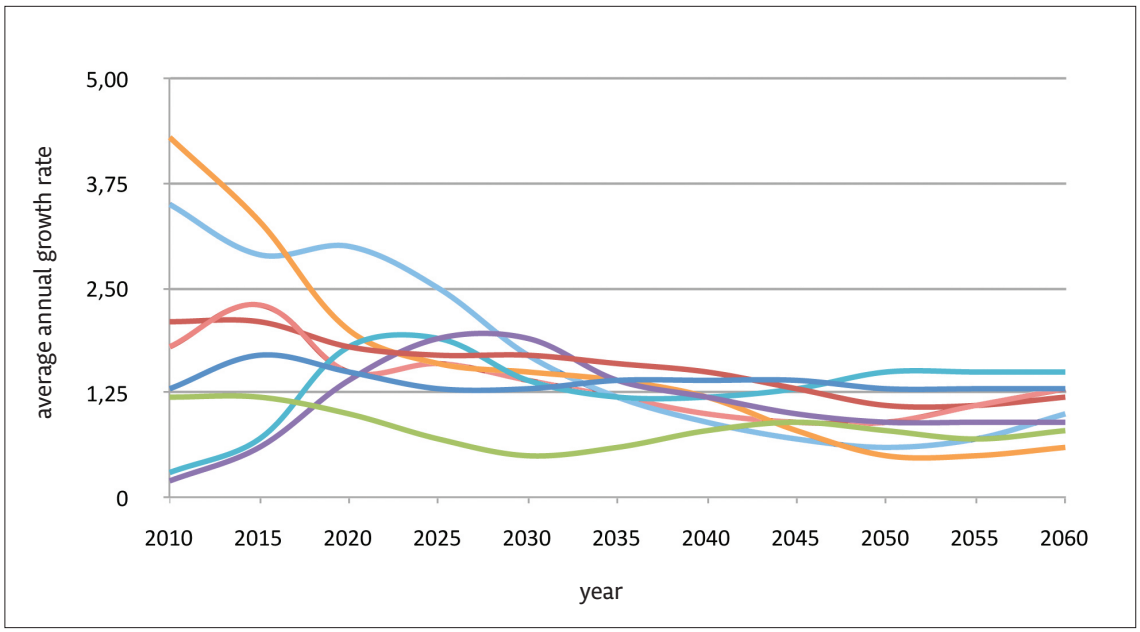
All indicators which affect transport demand are arranged by traffic zones. There are 687 traffic zones in Slovenia, 95 in neighbouring countries and 45 in other Central European countries.

The forecast by traffic zones is based on the demographic forecast for two cohesion regions: Eastern Slovenia and Western Slovenia.

This takes into account the fact that the settlement pattern in Slovenia is relatively stable and will not significantly change in the future. At the level of the national model, a more detailed change in land use is not taken into account, as it will generally take place within the traffic zones of this transport model.

In addition to the demographic forecast by Eurostat, the forecast of socio-economic conditions

Figure 41. Average GDP movement



in the two cohesion regions is also based on an analysis of the current development by statistical regions. The current development is also taken into account in the forecast for the two cohesion regions.

Therefore, the forecast of the socio-economic conditions shown here and used in the transport

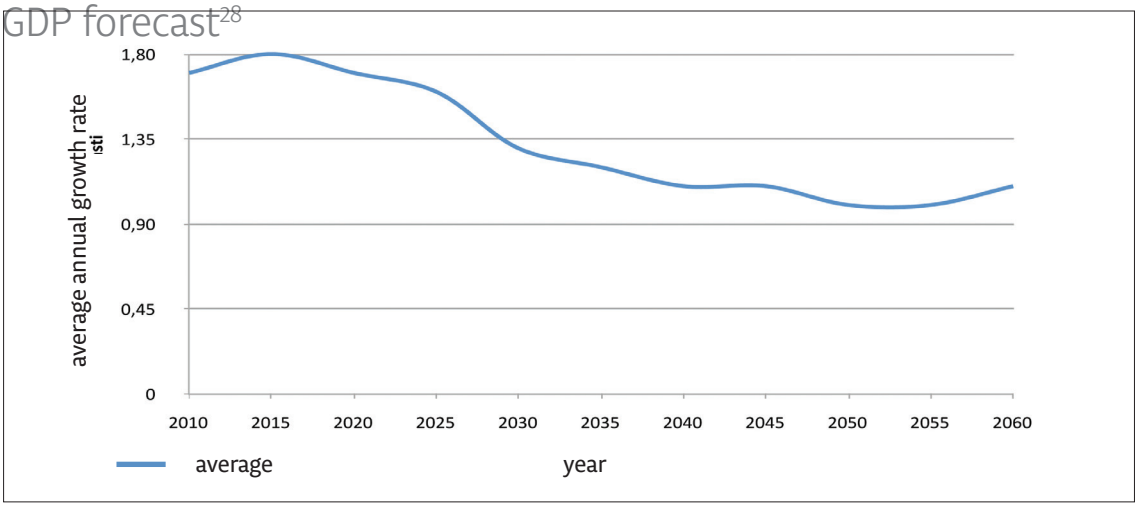
29: Breakdown of Gross Domestic Product per capita in its components. The projection of average annual growth rates of GDP per capita and employment 2010–2060 is summarised from the publication of the European Commission, "The 2012 Ageing Report: Economic and budgetary projections for the 27 EU Member States 2010–2060" (EC, European Economy, 2/2012). The regularly average annual growth rates is given in five-year periods from 2010 to 2060.

model is more or less a continuation of the current development orientation. It does not take into account scenarios of various political measures which could change the current development. If interest is shown, the impact of these scenarios will be examined in subsequent analyses of spatial and socio-economic variants.

Table 3.9: Average GDP growth rates in Slovenia and hinterland countries between 2010 and 2060

4.3.8.4 GDP forecast[28]

Figure 42. Movement of average annual GDP growth rates in Slovenia



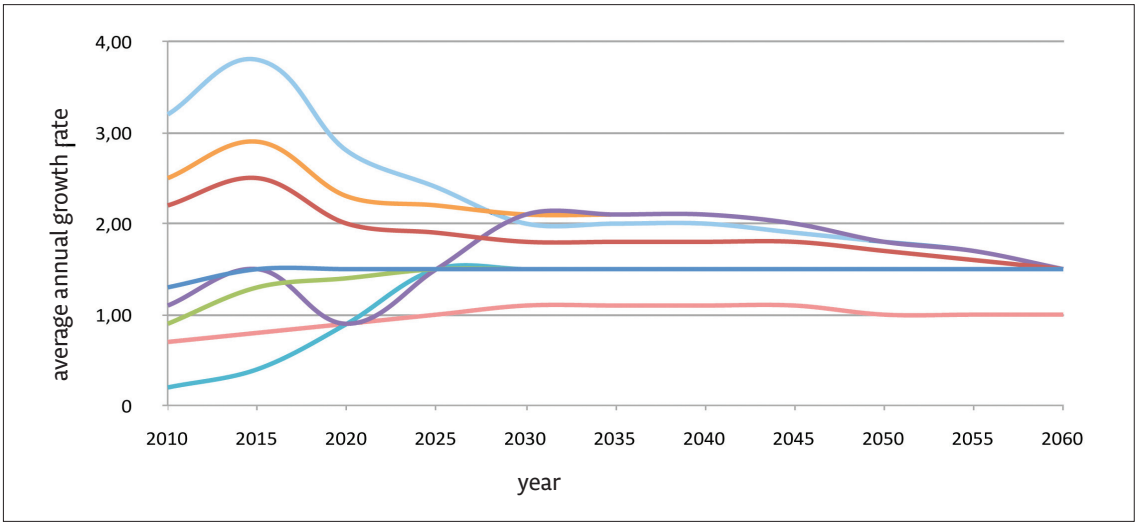
The table of average annual growth rates for 2010–2060 is given below and includes influential countries, i.e.:

- Austria,
- Czech Republic,
- Germany,
- Hungary,
- Italy,
- Poland,
- Slovakia and
- Slovenia.

Table 3.10: Projection of average annual GDP growth rates

	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Austria	1,3	1,7	1,5	1,3	1,3	1,4	1,4	1,4	1,3	1,3	1,3
Czech Republic	2,1	2,1	1,8	1,7	1,7	1,6	1,5	1,3	1,1	1,1	1,2
Germany	1,2	1,2	1,0	0,7	0,5	0,6	0,8	0,9	0,8	0,7	0,8
Hungary	0,2	0,6	1,4	1,9	1,9	1,4	1,2	1,0	0,9	0,9	0,9

Figure 43. Projection of average annual productivity growth rates



Italy	0,3	0,7	1,8	1,9	1,4	1,2	1,2	1,3	1,5	1,5	1,5
Poland	4,3	3,3	2,0	1,6	1,5	1,4	1,2	0,8	0,5	0,5	0,6
Slovakia	3,5	2,9	3,0	2,5	1,7	1,2	0,9	0,7	0,6	0,7	1,0
Slovenia	1,8	2,3	1,5	1,6	1,4	1,2	1,0	0,9	0,9	1,1	1,3

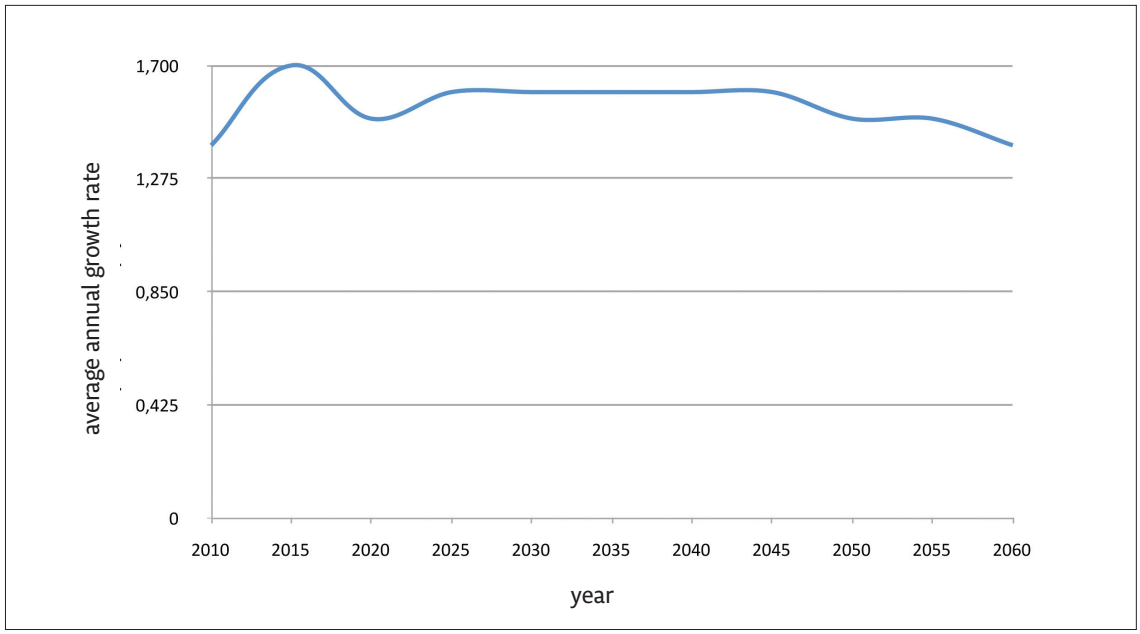
productivity levels in the total economy.

The table shows the forecast of a gradual reduction in economic growth in all hinterland countries by 2060, except in Italy and Hungary. The movement of average annual GDP growth rates is also shown in the diagram below.

Table 3.11: Average productivity growth rates in Slovenia and hinterland countries between 2010 and 2060

Average weighted values of average annual GDP growth rates were also calculated for Slovenia and hinterland countries. GDP per capita in hinterland countries was used as the GDP growth weight[29]. The OECD data serve as weights for hinterland countries for 2012. Table 3.9 shows weighted average

Figure 44. Average productivity movement



4.3.8.6 Employment forecast

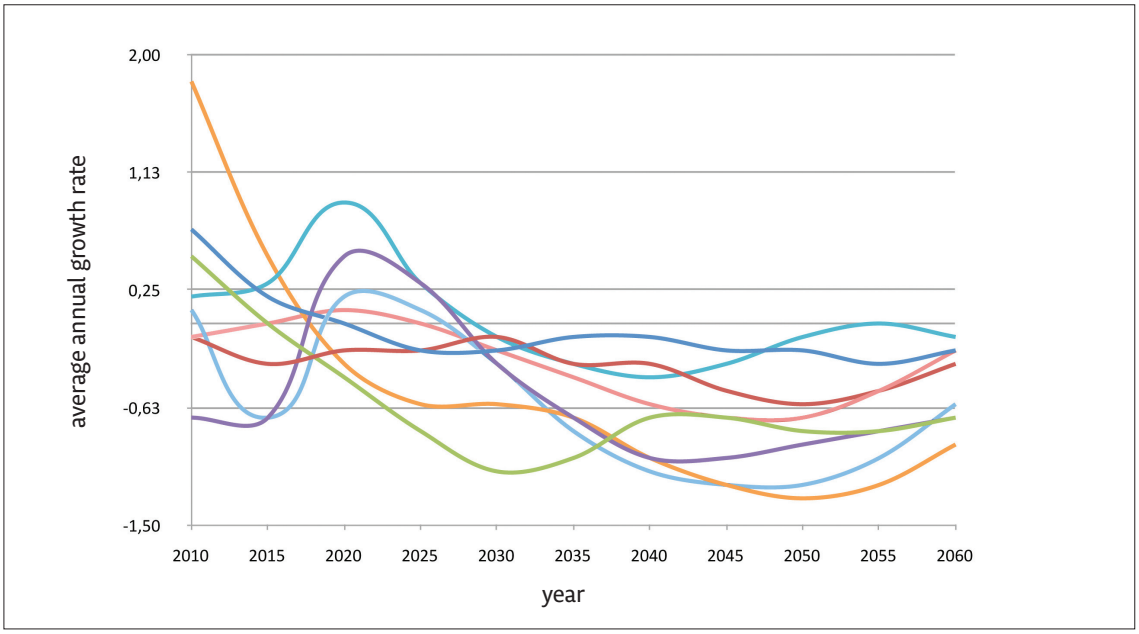
Table 3.12 shows a forecast gradual reduction in employment in all hinterland countries by 2060.

	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Austria	0.7	0.2	0.0	−0.2	−0.2	−0.1	−0.1	−0.2	−0.2	−0.3	−0.2
Czech Republic	−0.1	−0.3	−0.2	−0.2	−0.1	−0.3	−0.3	−0.5	−0.6	−0.5	−0.3
Germany	0.5	0.0	−0.4	−0.8	−1.1	−1.0	−0.7	−0.7	−0.8	−0.8	−0.7
Hungary	−0.7	−0.7	0.5	0.3	−0.3	−0.7	−1.0	−1.0	−0.9	−0.8	−0.7
Italy	0.2	0.3	0.9	0.3	−0.1	−0.3	−0.4	−0.3	−0.1	0.0	−0.1
Poland	1.8	0.5	−0.3	−0.6	−0.6	−0.7	−1.0	−1.2	−1.3	−1.2	−0.9
Slovakia	0.1	−0.7	0.2	0.1	−0.3	−0.8	−1.1	−1.2	−1.2	−1.0	−0.6
Slovenia	−0.1	0.0	0.1	0.0	−0.2	−0.4	−0.6	−0.7	−0.7	−0.5	−0.2

Table 3.12: Projection of average annual employment growth rates

The movement of average annual employment growth rates is also shown in the diagram below.

Figure 45.
Projection of average annual employment growth rates



Average weighted values of average annual employment growth rates were also calculated for Slovenia and hinterland countries. GDP per capita in hinterland countries was used as the relevant growth weight[31]. The OECD data serve as weights for hinterland countries for 2012. Table 3.13 shows weighted average annual employment growth rates in Slovenia and hinterland countries between 2010 and 2060.

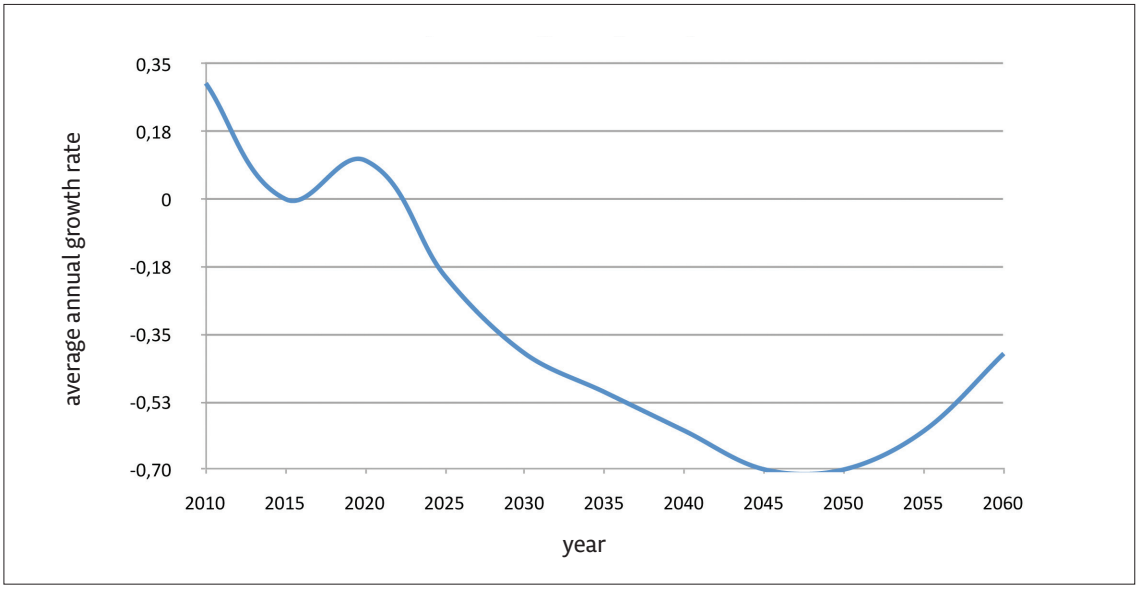
31: Breakdown of Gross Domestic Product per capita in its components.

	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Average	0.3	0.0	0.1	–0.2	–0.4	–0.5	–0.6	–0.7	–0.7	–0.6	–0.4

Table 3.13:
Average annual employment growth rates in Slovenia and hinterland countries between 2010 and 2060

The table shows that in the period between 2010 and 2060 the average annual employment growth rate in Slovenia and hinterland countries will decline from 0% in 2015 to –0.4% in 2060. The movement of average employment growth rates is also shown in Figure 46 below.

Figure 46.
Movement of average annual employment growth rates



4.3.8.7 Transport forecasting for the ports of Koper, Trieste and Rijeka, and Ljubljana Jože Pučnik Airport

Ports of Koper, Trieste and Rijeka

Transhipment volumes through the north Adriatic ports are the direct basis for assessing land goods transport that is bound for ports. Therefore, the demand for land goods transport with an origin or destination in ports is determined with an equation which includes the growth in transhipped cargo and an elasticity factor.

The transhipment forecast is based on the pan-European forecast, which uses the TRANS–TOOLS model, and a study prepared by NAPA (North Atlantic Ports Association),[32,33] which encompasses the ports of Koper, Rijeka, Trieste and Venice.

Forecasts of traffic volumes in the Port of Koper were prepared for 2015, 2020 and 2035; traffic for intermediate periods was determined through linear interpolation.

32: Summary of Market study on the potential cargo capacity of the North Adriatic ports system in the container sector (NAPA), Final Report, MDS Transmodal Limited Study, januar 2012.
33: Feasibility study for the new Divača–Koper railway line, Section Divača–Črni Kal, Section Črni Kal–Koper, DRI, januar 2012.

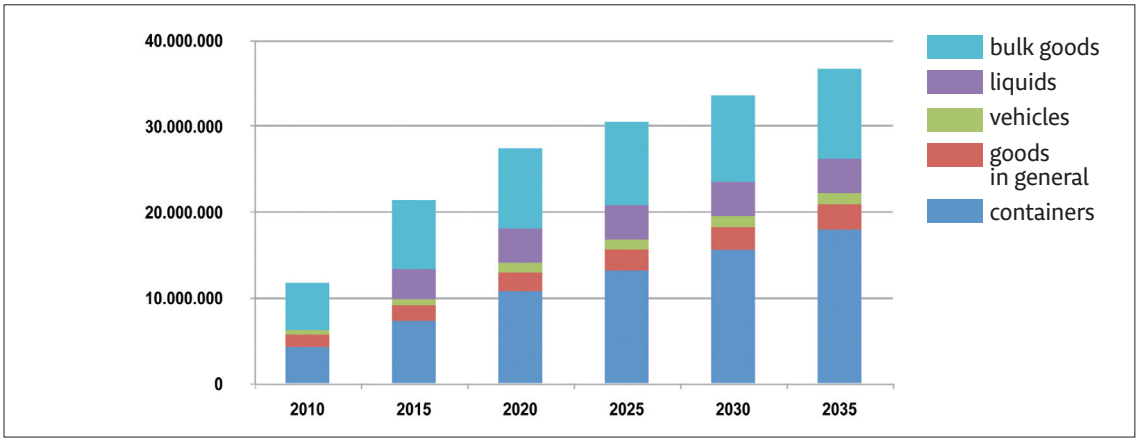
Type of cargo	2010	2015	2020	2025	2030	2035
Containers	4,302,543	7,335,000	10,800,000	13,200,000	15,600,000	18,000,000
Goods in general	1,445,651	1,805,000	2,175,000	2,426,667	2,678,333	2,930,000
Vehicles	533,300	740,000	1,145,000	1,196,667	1,248,333	1,300,000
Liquids	2,727, 014	3,500,000	4,000,000	4,000,000	4,000,000	4,000,000
Bulk goods	5,504,963	8,030,000	9,320,000	9,703,333	10,086,667	10,470,000
Total	**14,513,471**	**21,410,000**	**27,440,000**	**30,526,667**	**33,613,333**	**36,700,000**

Table 3.14: Forecast of transhipment volumes in the Port of Koper (net tonnes/year)

Source: NAPA in Luka Koper.

In 2008, 16,050,448 tonnes of goods were transhipped through the Port of Koper. In 2009 and 2010, the volume of transhipped goods declined, but then began to grow again quickly. The volume of transhipped goods will grow by approximately 70% by 2020 and will more than double by 2030. The volume of goods shipped in containers will grow most.

Figure 47. Forecast of total transhipment in the Port of Koper (net tonnes/year)



High transhipment growth is justified by cheaper and quicker transport to the north Adriatic ports and Central Europe in comparison with North Atlantic ports. High growth at the Port of Koper will be facilitated by the anticipated modernisation of the port.

The increased scope of transhipment will also affect the growth of land goods transport; an elasticity factor of 1.00 was applied.

All types of cargo (48 million tonnes in 2008) are transhipped in the port of Trieste, but liquid cargo prevails (over 80% of all transhipment), making it the most important north Adriatic port for the transhipment of crude oil. A pipeline runs from the port of Trieste to Ingolstadt, which connects Italy, Austria and Germany with its branches, and distributes oil to Central Europe.

Based on the aforementioned forecasts, it is estimated that transhipment through Trieste will grow at a similar rate as in Koper, i.e. transhipment will grow by approximately 70% by 2020 and will more than double by 2030. Since most cargo will still be liquids, which will largely be transported via pipelines, transhipment in Trieste will continue to put less burden on rail and road infrastructure.

According to transhipment volumes, the port of Rijeka is still weaker than Koper (12 million tonnes of transhipment in 2008). Liquid cargo also predominates in Rijeka (approximately 50% of total transhipment), while container transhipment is relatively low. The port of Rijeka is not connected to a pipeline; therefore, cargo is also transported by rail and road.

It is assessed that transhipment quantities through the port of Rijeka will somewhat increase, i.e. by 85% by 2020, and by 2.5 times by 2030. The higher growth is particularly due to more cargo being transported in containers.

The ports of Venice and Ravenna have their own gravitational hinterland, especially in northern Italy, and thus do not significantly affect traffic conditions in Slovenia. Therefore, their impact on land transport in Slovenia was not taken into consideration.

Ljubljana Jože Pučnik Airport

In August 2010, a master plan for the long-term development of Ljubljana Jože Pučnik Airport was drafted[34]. The long-term development of passenger and goods transport was also anticipated within this framework.

34: Summary of the Master plan for Ljubljana Jože Pučnik Airport, Aerodrom Ljubljana, HOCHTIEF Airport, August 2010.

Since 2008, air transport at this airport has been declining (by 14.4% in 2009). However, further growth is anticipated in the long term, i.e. growth is expected to almost double between 2008 and 2030. The relatively high further growth in transport (at an average annual rate of 3.35% annually up to 2040) is anticipated largely due to the airport's favourable geostrategic location.

Figure 48. Forecast of passengers transported at Ljubljana Jože Pučnik Airport

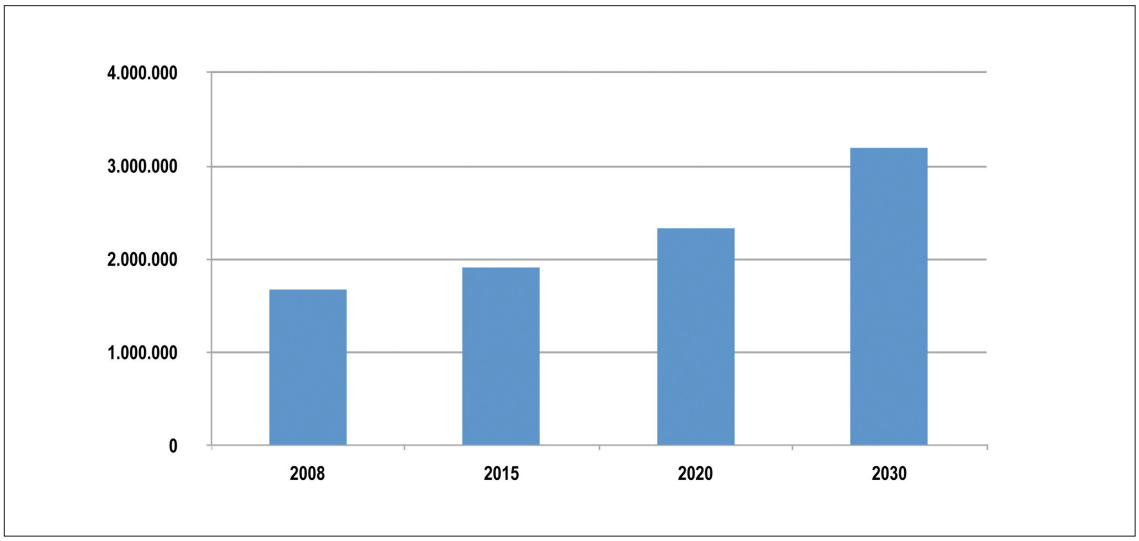


Table 3.15: Forecast of passengers transported at Ljubljana Jože Pučnik Airport

Source: HTA, Symbios (the study was carried out before 2008; therefore, 2008 is forecast in the table; approximately the same number of passengers were actually transported in 2008 as forecast).

Year	Passengers
2008	1.673.050
2015	1.909.860
2020	2.330.848
2030	3.191.805

The table and figure above show that the number of passengers transported is expected to grow by approximately 40% by 2020 and by 90% by 2030.

The anticipated growth is expected to be followed by an expansion of activities and modernisation of equipment at the airport. A new 36,275 m2 passenger terminal is expected to be constructed, followed by manoeuvring areas, an apron, an access system, the Aeropolis Ljubljana business and logistics centre, a multimodal logistics centre with a rail connection, parking areas, cargo facilities, hangars, GSE and secondary airport facilities.

The construction of the multimodal logistics centre and a terminal with a connection to the Jesenice–Ljubljana railway line is expected to result in high growth in goods transport. The volume of air goods transported is expected to grow from the current 10,000 tonnes per year to 60,000 tonnes by 2040. The volume of road goods transported is expected to grow from the current 7,200 tonnes per year to 100,000 tonnes by 2040. Thus transport is expected to have grown almost 14-fold by 2040[35], which means that it is expected to grow 10-fold by 2030.

35: Jože Pučnik Airport as a logistic centre' feasibility study, Symbios, 2007.

In the next two decades, the development of the airport is expected to generate over 4,500 jobs and another 500 indirectly, which is a total of 9,500.

Ljubljana Jože Pučnik Airport is heading for very ambitious development. The greatest change is expected to take place in goods transport. However, such intensive development by 2030 is somewhat doubtful. In the light of past developments, the development of passenger transport is within normal parameters, whereas the development of goods transport is probably exaggerated or unattainable by 2030. According to our assessment, the forecast for new jobs is also exaggerated, since there will not be substantially more employed persons or jobs in the Gorenjska region in 2030 compared to 2008.

Due to air transport growth, road transport will also grow. For all scenarios in the calculation of passenger traffic production, an elasticity factor of 1.00 is taken into account, which was also established for past development. Mode choice is determined by the model. In this forecast, the same growth rate as for passenger transport is also taken into account for road goods transport.

4.3.8.8 Bases of transport supply forecast

The previous chapter includes a presentation of the anticipated socio-economic factors which stimulate transport. Other factors also affect transport, especially transport costs, transport policy measures, network transport supply and political changes.

Travel and transport costs

In the CETRA and PRIMOS models, the transport network supply is expressed by a generalised price or generalised time, which is the sum of monetary and non-monetary travel costs. Monetary costs include directly paid costs (fuel, vehicles services, tyres, tolls, user fees, tickets for public transport, loading costs, unloading costs, transhipment costs, etc.), while non-monetary costs concern the travel and transport time from door to door required for the journey to be completed.

This chapter includes a presentation of the direct monetary costs incurred by a journey or by transport, which are included in the prognostic transport model. Furthermore, the value of time is also determined, enabling the conversion of monetary costs into time.

Parameters of travel costs in Central Europe

The parameters of travel costs are based on the baseline scenario, which, together with other scenarios, was analysed in the TRANSvisions project in 2009. The values used in the model are shown in Table 3.16.

Table 3.16: Travel costs used in the transport model (increase or decrease considering the base year of 2005)

Parameter	Year	
	2020	2030
Ticket price for bus and train	50% of GDP growth	50% of GDP growth
Fuel costs for private vehicles	7%	7%
Costs of road haulage vehicles	4%	4%
Costs of rail goods transport	-10%	-10%
Internalisation of external costs		
Passenger transport	0	0
Goods transport	Costs of noise, air pollution and crowds	Costs of noise, air pollution and crowds

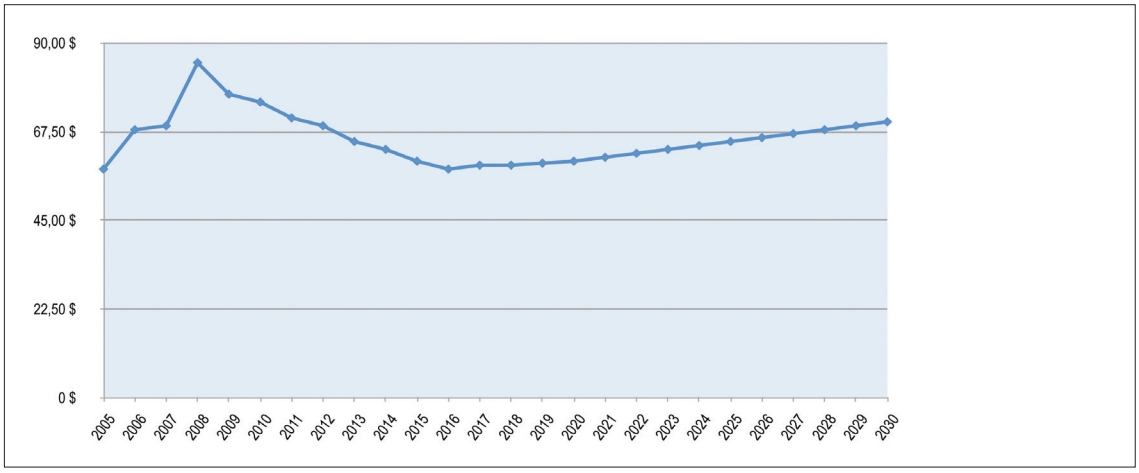
The value of time for passenger transport is determined on the basis of the anticipated growth in GDP in Europe.

Fuel prices are determined on the basis of anticipated fuel prices prepared by the US Government in 2008.[36]

36: US Energy Information Administration, 2008.

Figure 49.: Forecast of oil price movements by US Energy Information Administration, 2008.

Source: EIA, forecast in 2008 (prices of 2006)



According to this forecast, a price reduction is anticipated by 2016, which will be followed by slow growth. Thus fuel prices by 2030 are expected to be approximately 20% higher than in 2005. However, since it is expected that fuel consumption will decline by 0.5% due to more efficient car engines and other factors, fuel consumption will realistically grow by only 7% (expressed in prices from 2005).

It is assumed that in 2030 there will be very few zero-emission vehicles. Therefore, the same costs are assumed for these vehicles as for emission-producing vehicles.

The operating costs of heavy goods vehicles are comprised of various costs, such as fuel, lubricants, vehicle services, drivers' wages, insurance and other costs. Approximately two thirds of costs are related to travel time, while one third relates to distance travelled. Due to the technological development of vehicles, efficient planning of vehicle use and significant competition, a slight rise in costs related to distance travelled is expected, i.e. by 4% by 2030 (at fixed prices).

Direct monetary costs also include tolls and other costs. Tolls around Europe differ greatly. In some countries, a flat-rate toll is paid via vignettes, and in some countries, tolls differ for private vehicles and goods vehicles. Elsewhere, there is no toll. Tolls are not paid in Finland, Sweden, Denmark, Germany, Benelux, Great Britain or the Baltic states. It is assumed that in 2030, the toll system will be the same as in 2005.

From 1999 to 2006, the price of train tickets within the EU-25 increased by 9% (at fixed prices), while the price of bus tickets rose by 17% during the same period. During that same period, GDP also grew by 17%. Considering the fact that rail public passenger transport is expected to have a

more important role in the future, it is assumed within the TRANS-TOOLS model that the price of a public transport ticket will not increase by 2030 by more than 50% of GDP growth. The absolute upper limit of the increase in ticket price is 30% compared to 2005.

The model takes into account for 2020 the same values of parameters as for 2030.

The costs within the generalised cost of goods transport which are taken into account in both prognostic periods are the same as at present.

The internalisation of external costs in this forecast is not taken into account.

Parameters of travel and transport costs in Slovenia

The anticipated parameters of travel and transport costs are based on assumptions similar to those in the European transport model.

The value of time for 2020 and 2030 is determined on the basis of the anticipated growth in GDP in Slovenia with an elasticity factor of 1. This is the prevailing practice in developed European countries. Nevertheless, opinions differ on this matter.

At a later date, Slovenia is expected to end its vignette system for private vehicles and transfer to tolling in free traffic flow, which is taken into account in the transport model.

Parking policy, which considerably affects mode choice, is also taken into account for passenger transport in 2020 and 2030.

The future prices of fuel and public transport tickets, and of other costs are determined in the same manner as at the Central European level, i.e. on the basis of oil price movements prepared by the US Government and on the assumption that the increase in the price of public transport tickets will be relatively lower. For the calculation of the generalised price of goods transport, the same amount of costs as currently is taken into account.

The parameters of travel costs in Slovenia used in the transport model are presented in Table 3.17.

Table 3.17: Transport costs for 2020 and 2030 used in the transport model, prices from 2009 (absolute value or as the share of increase or reduction compared to 2008, expressed in %)

Parameter	Year	
	2020	2030
Value of time		
Business trip	EUR 9.56/h	EUR 13.64/h
All other purposes of a trip	EUR 3.14/h	EUR 4.09/h
Ticket price		
Train	EUR 0.080/km	EUR 0,093/km
Bus	EUR 0.134/km	EUR 0,155/km
Private vehicle fuel and maintenance costs	**1%**	**14%**
Costs of road haulage vehicles		
Light goods vehicles	6%	21%
Heavy goods vehicles	4%	13%
Tolling in free traffic flow		
Private vehicles	EUR 0.050/km	EUR 0,050/km
Buses	EUR 0.137/km	EUR 0,137/km
Light goods vehicles	EUR 0.090/km	EUR 0,090/km
Heavy goods vehicles	EUR 0.199/km	EUR 0,199/km
Parking prices in bigger towns	**0 to +5%**	**0 to +25%**

At a later date, *tolling* in free traffic flow is expected to be introduced on motorways and expressways. The same amount of toll per unit as prior to the introduction of vignettes is assumed. It is assumed that the real price of tolling will not change by 2030.

The availability of car parks and the cost of parking significantly affect the choice of passenger transport mode.

Network and political bases

At the Central European level, the anticipated new construction and modernisation of the railway network are assumed, i.e.:

- railway:
  - in Italy, the modernisation of the Venice–Palmanova/Trieste line assumed;
  - in Austria, the modernisation or new construction of the Villach–Klagenfurt–Graz–Vienna line and the Linz–Vienna–Bratislava line is assumed;
  - in Hungary, the current situation is assumed;
  - in Croatia, the current situation is assumed;
- roads:
  - in all neighbouring countries, the current situation is assumed, as most of the motorway system has already been constructed.

It is expected that Serbia will join the EU by 2030. The accession of Serbia is especially important, as this will mean the simplification of border procedures and greater attractiveness of transport routes for Romanian, Bulgarian, Turkish and other traffic flows.

4.4 Analysis of the zero (do-nothing) alternative – establishing problems and proposing measures

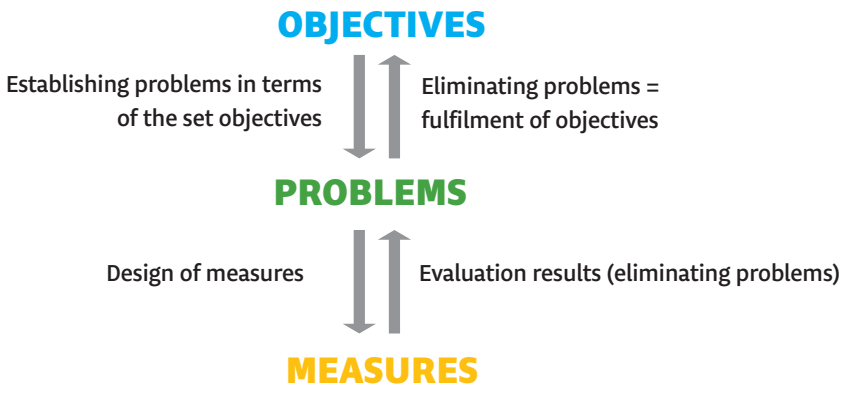
4.4.1 Introduction

In order to justify the need to take action in the field of transport and transport infrastructure, analyses of the zero alternative were carried out: what it would mean for the Republic of Slovenia if it took no action in this field (the so-called do-nothing alternative), except to maintain the existing situation (thus not worsening it).

Thus transport conditions and its effects on the current transport network were analysed. The results of the analysis include current and expected problems as the basis for forming measures that eliminate these and other problems.

On this basis, we determined potential measures for transport and transport infrastructure development in the Republic of Slovenia.

Figure 50.
Design and evaluation of alternatives



The design of measures and sets of measures is based on the fundamental objectives we wish to attain (and which were determined in the previous phases of preparation), established current and expected problems which deviate from the objectives, and on measures solving problems that occur.

Most problems are determined with the CETRA national transport model on the basis of an analysis of the situation with the current transport arrangement in 2011 and 2030. Certain problems were determined on the basis of preliminary studies and reports by stakeholders (cycling routes, traffic safety, the Port of Koper, airports).

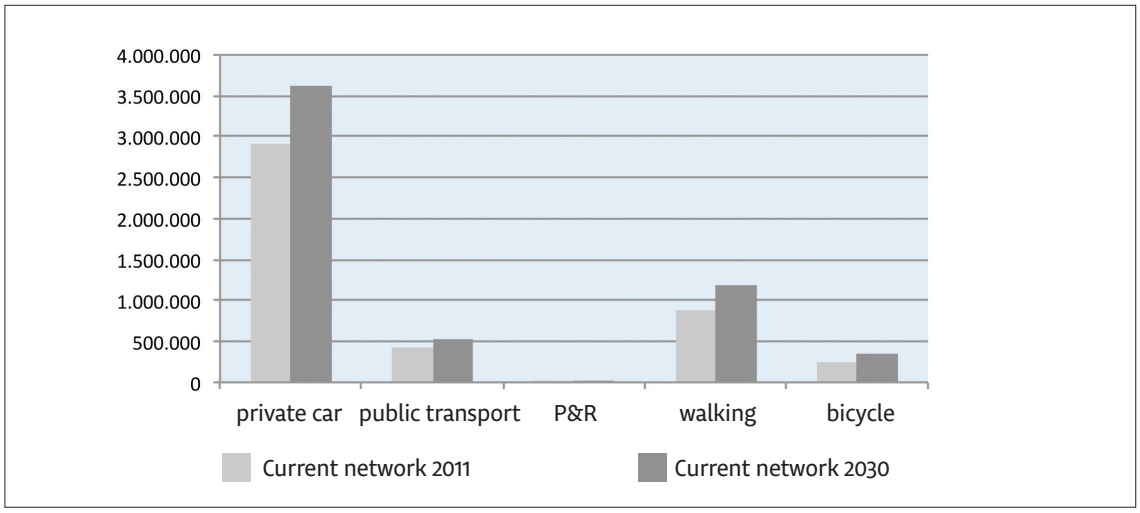
Most measures that solve established problems are determined as alternatives, i.e. several measures are determined to solve one problem. Some measures are in conflict, while others supplement each other.

4.4.2 Modal split

4.4.2.1 Passenger transport

Currently, 69% of trips in Slovenia are carried out by private vehicle, 8% by public passenger transport, 5% by bicycle and 18% walking. If the transport arrangement remains unchanged, 68% of trips in 2030 will be carried out by private vehicle, 7% by public passenger transport, 5% by bicycle and 20% on foot. Thus mode choice would not significantly change; the increase in the number of trips would be approximately the same for all means of transport, as is evident in Figure 51.

Figure 51.
Number of trips in Slovenia in 2011 and 2030



The CETRA national transport model used to assess the Strategy is very comprehensive and includes all important impacts, internationally accepted socio-economic and other starting points and all Slovenian territory and an essential part of Europe. The results of the model are completely independent of subjective assessments, and we believe them to be forecasts within realistic frameworks, which was also confirmed by credible forecasts from neighbouring countries of the same figure as our forecasts, although they were obtained independently from one another.

Table 3.18:
Change in socio-economic indicators assumed and calculated transport growth

Table 3.18 shows data on the growth of socio-economic indicators and transport in the periods discussed in individual transport models.

	Slovenia (2011–2030)	Austria[37] (2010–2025)	Germany[38] (2010–2030)
Number of inhabitants	–1.4 %	+0.6 %	–2.4 %
GDP	+40.6 %	+34.6 %	+25.4 %
Passenger transport (total) – pkm	+21.3 %	+16.1 %	+12.2 %
Motorised individual transport – pkm	+21.1 %	+16.1 %	+9.9 %
Goods transport	+68.3 %	+42.7 %	+17.6 %

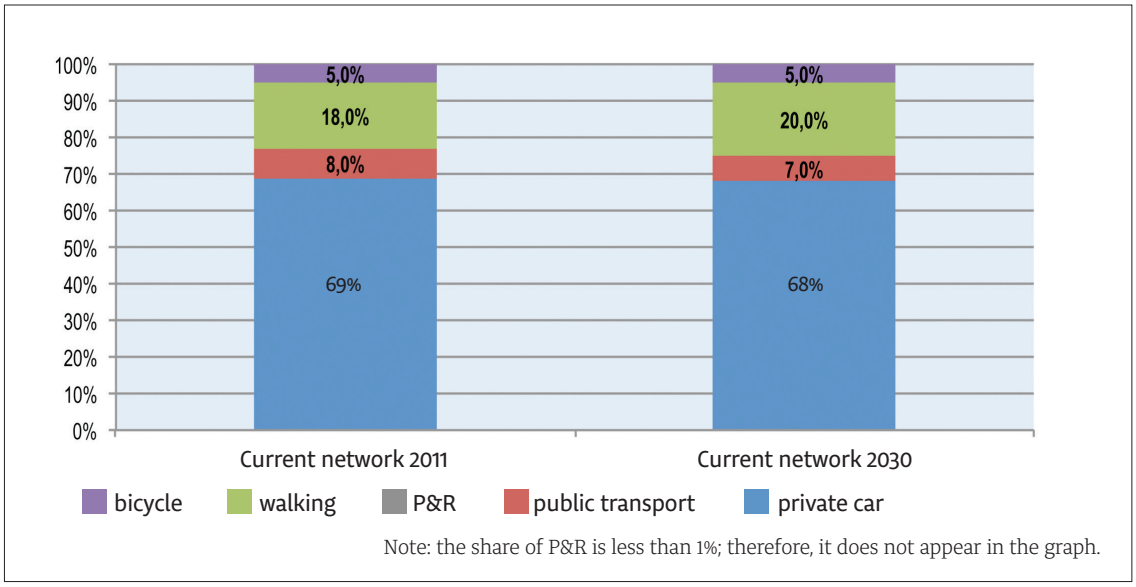
37: Bmvit, VERKEHRSPROGNOSE ÖSTERREICH 2025+, Endbericht, 6 Gesamtverkehr, 2009.

38: BMVI, Verkehrsverflechtungsprognose 2030, Zusammenfassung der Ergebnisse, 2014.

It may be determined from the table that the forecasts used in the preparation of expert groundwork for the Strategy are comparable to Austrian and German forecasts. This applies to the stagnation in the population (minimum increase or decrease), GDP growth (somewhat increased growth of economically less developed countries) and transport growth. Transport grows more in Slovenia and Austria, particularly the transport of goods, since these are transit countries. Furthermore, the mobility rate of population in Germany has possibly reached its limit.

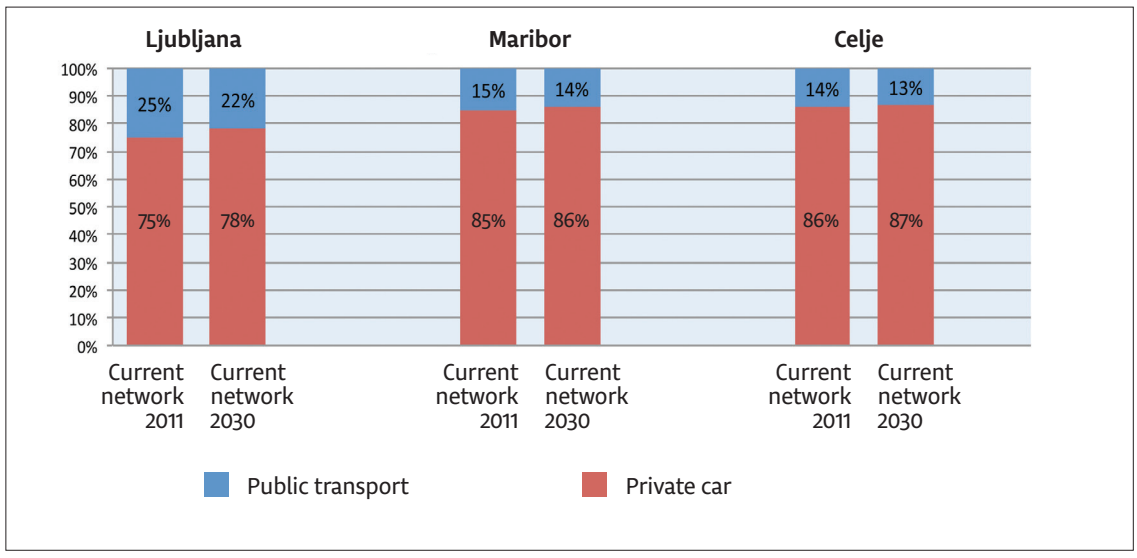
The Annex includes traffic flows of motorised road, public passenger and goods transport for the so-called zero scenario for 2030.

Figure 52.
Modal split in Slovenia



Note: the share of P&R is less than 1%; therefore, it does not appear in the graph.

Figure 53.
Modal split at entry points to towns



An analysis of entries to, and exits from, larger towns shows (figure above) that the share of journeys by private vehicle would slightly increase, while trips by public transport would decline if transport options remain unchanged.

Desired state:

- The Resolution on the Transport Policy of the Republic of Slovenia (2006) includes inter alia an increase in the scope and quality of public passenger road and rail transport.
- The White Paper also recommends: a balanced utilisation of transport modes by 2030, and most medium-distance passenger transport by rail.
- The TEN-T Regulation adopted in December 2013 emphasises environmentally-friendlier transport modes, including public passenger transport.

- The same objectives are pursued by the Spatial Development Strategy of the Republic of Slovenia. In addition, the latter states that balanced development of the transport and settlement networks, the connection and development of transport hubs and transport and logistics terminals should be developed primarily in order to ensure transport connections among all areas and a more balanced development of the entire national territory, and to connect with the wider European area. The transport network is being developed as a comprehensive system connecting all forms and types of transport.

Actual state:

- Spontaneous development orientation: the role of private vehicles, public passenger and non-motorised transport will remain unchanged in Slovenia, while the role of private vehicles will even slightly increase when entering larger towns.

Finding:

- Mode choice will not spontaneously follow the principles of sustainable development as defined by European and Slovenian strategic documents and legislation. Therefore, this development orientation may be designated as problematic, since it will not contribute to realising EU or national policies.

Measures required to achieve the desired state:

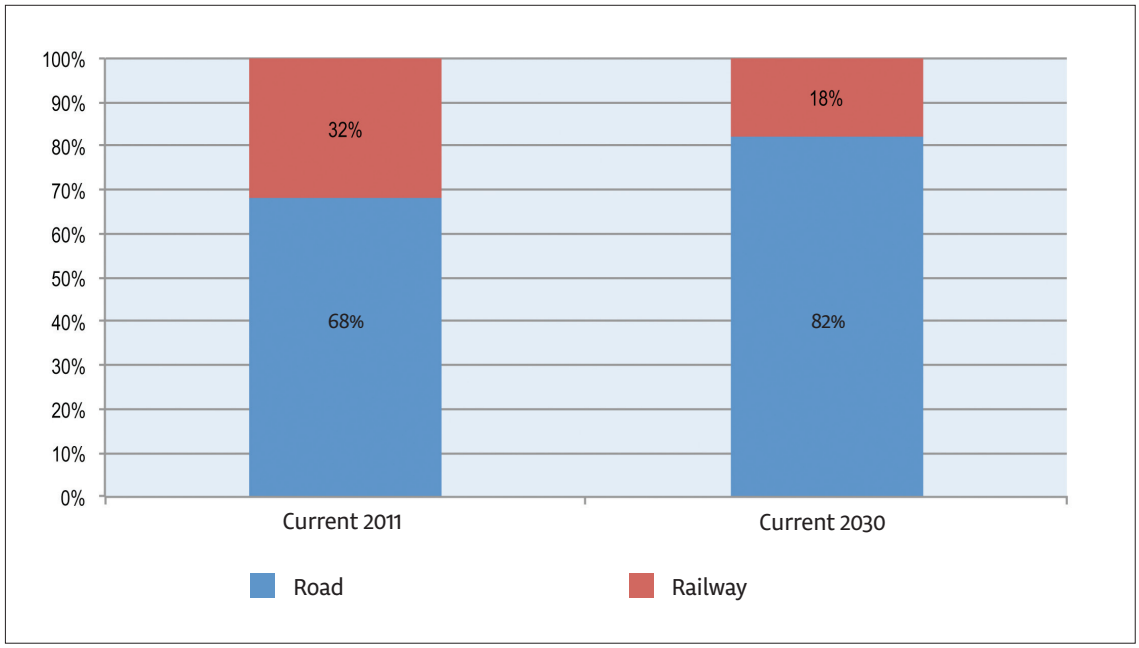
- introduce integrated public passenger transport with a uniform system administrator;
- more public passenger transport at own hub – so-called yellow lanes (increased travel speed);
- increase the frequency of public passenger transport services (during and outside peak hours) and harmonise timetables;
- ensure comfortable and simple transfers between public passenger transport modes;
- restrictive parking policy on public car parks in larger towns and the introduction of a P+R system;
- arrange comfortable and safe cycling routes and footpaths;
- restrict and control motorised transport in sensitive populated areas;
- raise awareness of residents in order to change their travel habits;
- better connections between spatial and transport planning at all levels;
- adjust public passenger transport measures to the characteristics of settlements and the needs of specific areas.

Through these measures, mode choice will change in favour of public passenger transport and non-motorised transport modes.

4.4.2.2 Goods transport

In Slovenia, an average of 68% of goods are currently transported by road and 32% by rail. If the transport arrangement remained unchanged, problems with rail capacity would transfer some goods transport back onto roads, while some would bypass Slovenia. In this case, 82% of goods would be transported by road in 2030 and only 18% by rail, as shown in Figure 54.

Figure 54.
Mode choice for goods transport in Slovenia



Desired state:

- The Resolution on the Transport Policy of the Republic of Slovenia (2006) determines: the majority of goods transport should be carried out by rail.
- The White Paper recommends inter alia: 30% of goods transport covering distances of over 300 km should be moved from the roads to the railways by 2030, and 50% by 2050.
- The Spatial Development Strategy of the Republic of Slovenia states that, in order to increase the efficiency of traffic flow, the development of intermodal transport connections and a railway network to carry most long-distance goods transport in the future should be stimulated. Parallel to the construction of the Slovenian motorway network, the circumferential system of traffic routes is being developed with regard to needs at the regional level, and the railway network is being modernised to adjust to higher speeds to take over the majority of long-distance goods transport.

Actual state:

- Spontaneous development orientation: due to problems with capacity, especially of the railway system, goods transport will be transferred to roads.

Finding:

- Mode choice will not spontaneously follow the principles of sustainable development or the recommendations of European and Slovenian strategic documents. Instead, it will develop in the opposite direction from the one desired. Therefore, this development orientation poses a problem.

Required measures:

Greater competitiveness and better quality of rail transport must be ensured. The capacity and speed of rail transport must thus be improved, especially by:

- modernising the core and comprehensive TEN-T networks (introducing ERTMS and interoperability);
- upgrading or constructing the core and comprehensive TEN-T networks by ensuring at least the minimum standards of the TEN-T network (the TSI V-M standard with a minimum speed of 100 km/h);
- constructing logistics centres.

4.4.3 Transport efficiency

4.4.3.1 Railway

Table 3.19: Technical parameters of main Slovenian railway lines [39]
39: Design of the Strategic Plan for the Development of Public Railway Infrastructure in the Republic of Slovenia, SŽ, December 2014.

The railway system is worn out and outdated, which is the result of insufficient investments, so it is already at the limit of its capacity. Four sections of main lines and all regional lines are single-track. Following the completion of the electrification of the Pragersko–Hodoš line, a total of 50% of railway lines will be electrified. The permitted speeds of 100 km/h or more are possible only on individual sections of main lines. An axle load of 22.5 t/axle is not facilitated throughout the entire network of main lines.

Line section	TSI- category	Line speed	Structure gauge	Axle load	Train length	Electrification
Koper–Divača	V–M	60–80	GB	22.5	515/505	YES
(Trieste)–state border–Divača	V–M	60–75	GB	22.5	600	YES
Divača–Borovnica	V–M	65–85	GB	22.5	600/590	YES
Borovnica–Ljubljana	V–M	75–100	GB	22.5	600	YES
Ljubljana–Zidani M.	V–M	65–120	GB	22.5	570	YES
Zidani Most–Dobova	V–M	75–120	GB	22.5	570	YES
Zidani Most–Pragersko	V–M	50–100	GB	20	597	YES
Pragersko–Maribor	V–M	80–120	GB	20	597	YES
Maribor–Šentilj–state border	V–M	80	GB	20	560	YES
Pragersko–Hodoš	V–M	80–100	GB	20	600	Underway
Ljubljana–Kranj	V–M	75–100	GB	22.5	~ 600	YES
Kranj–Jesenice	VII–M	75–100	GB	22.5	515	YES
Pivka–Ilirska Bistrica	VII–M	70–75	GB	20.0	530	YES
Ormož–Središče	VII–M	80–100	GB	20.0	600	YES

Table 3.20: Maximum scheduled speeds of goods trains and the axle load of the Baltic-Adriatic Corridor in the Republic of Slovenia[40]
40: Network Statement of the Republic of Slovenia 2016, 1.0 version of 14 December 2014, Slovenske železnice – Infrastruktura, d.o.o.

It is evident from Table 3.19 that a speed of at least 100 km/h is not enabled on the entire section of any line. The required standard of core lines on the TEN-T network for goods trains is thus not attained. And the speed required for V–M categories, which amounts to 160 km/h for passenger trains, is also not achieved. In addition to insufficient permitted axle load and required length of trains, this is one of the major problems of the Slovenian railway network, which prevents it from being competitive.

Scheduled speeds of goods trains and the axle load by corridors are presented below.

Line section	Total length [km]	Electrification length [km]	Maximum scheduled speed of goods trains 100 km/h or more				Axle load 22,5 tonnes/axle (D3 or D4)		
			from km	to km	Distance in km	Speed in km/h	from station	to station	Distance in km
State border–Divača	12.9	12.9			0		State border	Divača	12.9
Koper freight–Prešnica	31.5	31.5			0		Koper freight	Prešnica	31.5
Prešnica–Divača	16.5	16.5			0		Prešnica	Divača	16.5
Divača–Ljubljana	103.7	103.7			19.1		Divača	Ljubljana	103.7
			586.6	574.4	12.2	100			
			573.5	566.6	6.9	100			
Ljubljana–Zidani Most	63.9	63.9			23.1		Ljubljana	Zidani Most	63.9
			564.5	561.9	2.6	120			
			561.9	558.5	3.4	115			
			558.5	556.4	2.1	100			

Line section	Total length [km]	Electrification length [km]	Maximum scheduled speed of goods trains 100 km/h or more				Axle load 22,5 tonnes/axle (D3 or D4)		
			from km	to km	Distance in km	Speed in km/h	from station	to station	Distance in km
			550.1	543.3	6.8	110			
			541.4	538.7	2.7	100			
			534	528.5	5.5	110			
Zidani Most–Šentilj–state border	108.3	108.3			23.5				34
			533	540	7	100	Celje	Ponikva	18.4
			576.3	591.2	14.9	120	Pragersko	Maribor Tezno	15.6
			591.2	592.8	1.6	100			
Total (km)	**336.8**	**336.8**			**65.7**				**262.5**
Shares (%)	**100**	**100**			**19.5**				**77.9**

Table 3.21: Maximum scheduled speeds of goods trains and the axle load of the Mediterranean Corridor in the Republic of Slovenia [41]

41: Network Statement of the Republic of Slovenia 2016, 1.0 version of 14 December 2014, Slovenske železnice – Infrastruktura, d.o.o.

Line section	Total length [km]	Electrification length [km]	Maximum scheduled speed of goods trains 100 km/h or more				Axle load 22,5 tonnes/axle (D3 or D4)		
			from km	to km	Distance in km	Speed in km/h	from station	to station	Distance in km
State border–Divača	12.9	12.9			0		State border	Divača	12.9
Koper freight–Prešnica	31.5	31.5			0		Koper freight	Prešnica	31.5
Prešnica–Divača	16.5	16.5			0		Prešnica	Divača	16.5
Divača–Ljubljana	103.7	103.7			19.1		Divača	Ljubljana	103.7
			586.6	574.4	12.2	100			
			573.5	566.6	6.9	100			
Ljubljana–Dobova	114.7	114.7			54.9		Ljubljana	Dobova	114.7
			564.5	561.9	2.6	120			
			561.9	558.5	3.4	115			
			558.5	556.4	2.1	100			
			550.1	543.3	6.8	110			
			541.4	538.7	2.7	100			
			534	528.5	5.5	110			
			484.9	458.6	26.3	100			
			458.6	454.5	4.1	120			
			452.6	451.2	1.4	100			
Zidani Most–Pragersko	73.2	73.2			7				18.4
			533	540	7	100	Celje	Ponikva	18.4
Pragersko–Hodoš–state border	109.5	0			68.4				28.9
			1.1	39.5	38.4	100	Murska Sobota	State border	28.9
			38.8	44.1	5.3	100			
			44.5	69.2	24.7	100			
Total (km)	**462**	**352.5 (462*)**			**149.4 (190.5*)**				**326.6 (407.2*)**
Shares(%)	**/**	**76.3 (100*)**			**32.3 (41.2*)**				**70.7 (88.1*)**

Note: * Following the modernisation and electrification of the Pragersko–Hodoš line.

Table 3.22:
Maximum scheduled speeds of goods trains and the axle load of the Ljubljana–Jesenice–state border line[42]

42: Network Statement of the Republic of Slovenia 2016, 1.0 version of 14 December 2014, Slovenske železnice – Infrastruktura, d.o.o.

Line section	Total length [km]	Electrification length [km]	Maximum scheduled speed of goods trains 100 km/h or more				Axle load 22,5 tonnes/axle (D3 or D4)		
			from km	to km	Distance in km	Speed in km/h	from station	to station	Distance in km
Ljubljana–Jesenice–state border	70.9	70.9 (62.4 km			11.8		Ljubljana	Jesenice	62.4
		3 kV in							
		8.5 km 15 kV)							
			572.5	577.5	5	100			
			586.9	593.7	6.8	100			
							Jesenice	State border	8.5
Total (km)	**70.9**	**70.9**			**11.8**				**70.9**
Shares (%)	**/**	**100**			**16.6**				**100.0**

Figure 55.
Railway sections where the speed of goods trains exceeds or equals 100 km/h

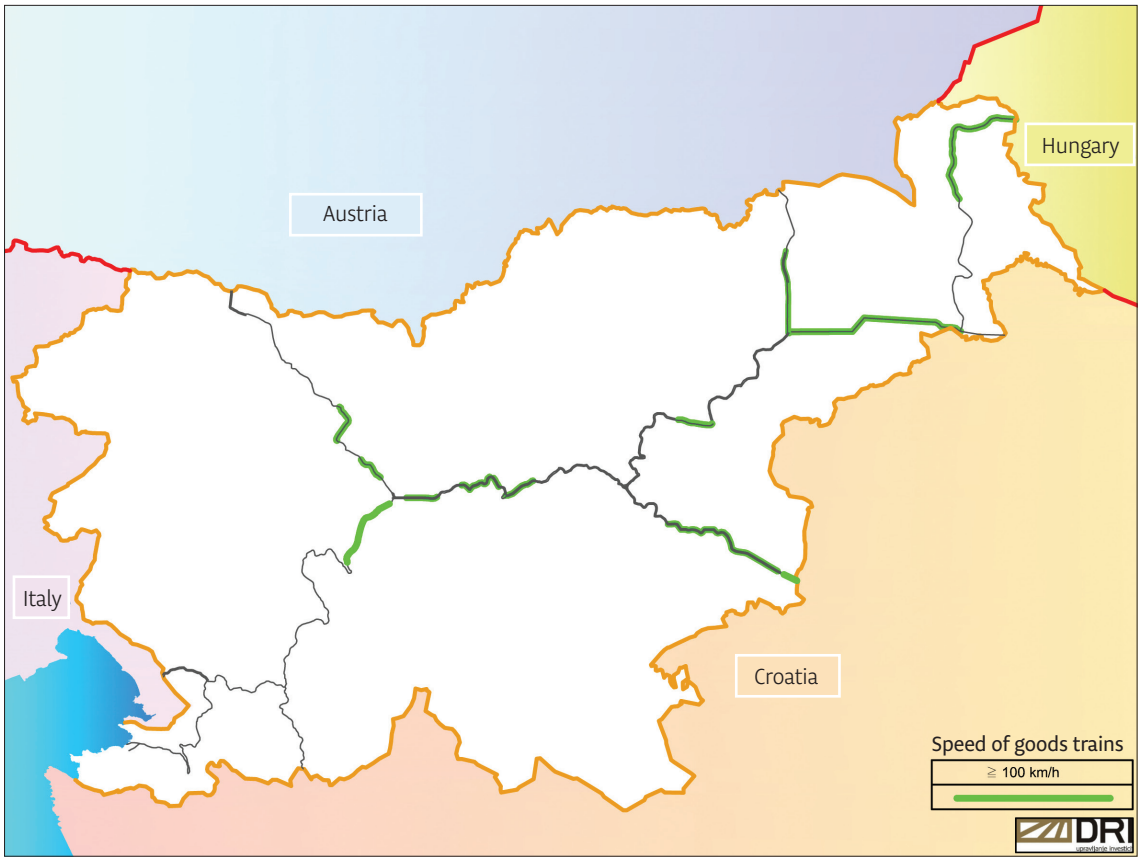


Figure 56 displays the share of goods trains on an average selected day for the current situation. It was established that mixed transport prevails on the majority of main lines, except on the Primorska and Prekmurje sections, where most transport is of goods. The Koper–Divača section stands out in particular. The biggest share of passenger trains is on regional lines.

Figure 56.
Analysis of significance of the lines from the viewpoint of mixed transport, 2011.

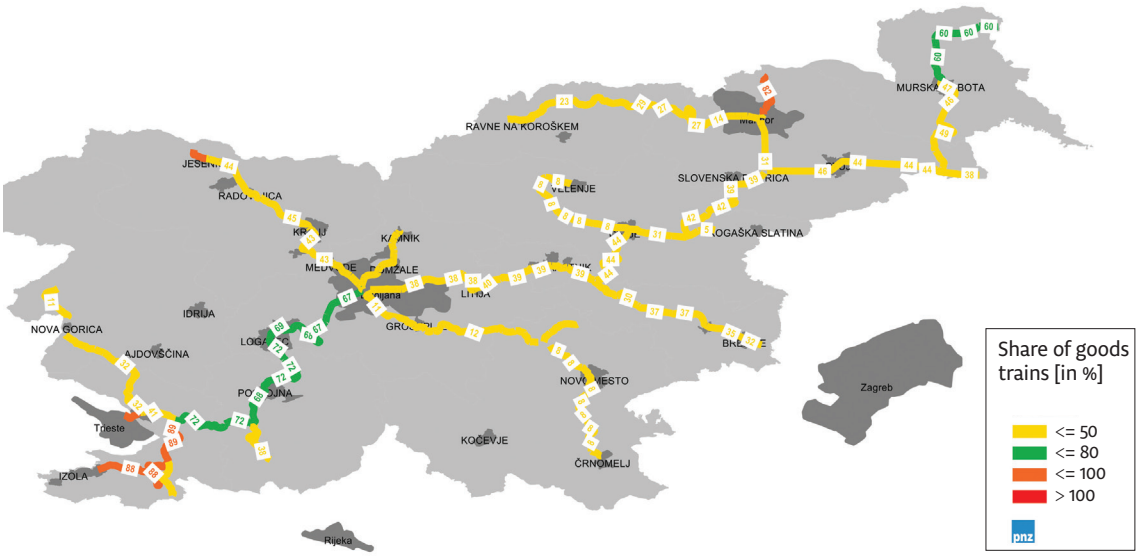


Figure 57 presents the accessibility of people to railway stations (the criterion was a distance of less than 500 metres from the nearest station). It is evident that most railway stations have unsuitable micro-locations, since they do not allow access to a greater number of people on foot. The use of public rail transport is thus lower, which is also the result of inappropriate spatial planning in the past. The situation regarding accessibility to jobs is similar.

The solution lies in integrated public transport, wherein the railway serves as the central vessel and buses and other transport modes (P+R system, bicycle etc.) are its supply lines.

Figure 57.
Access to railway stations

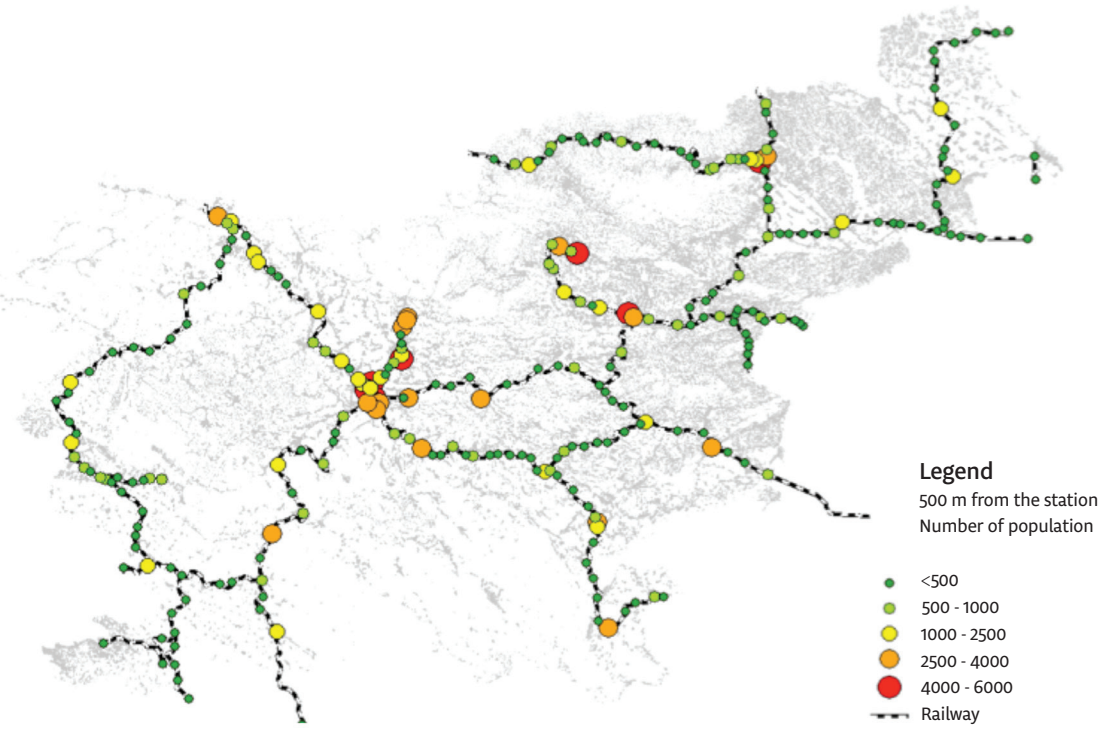
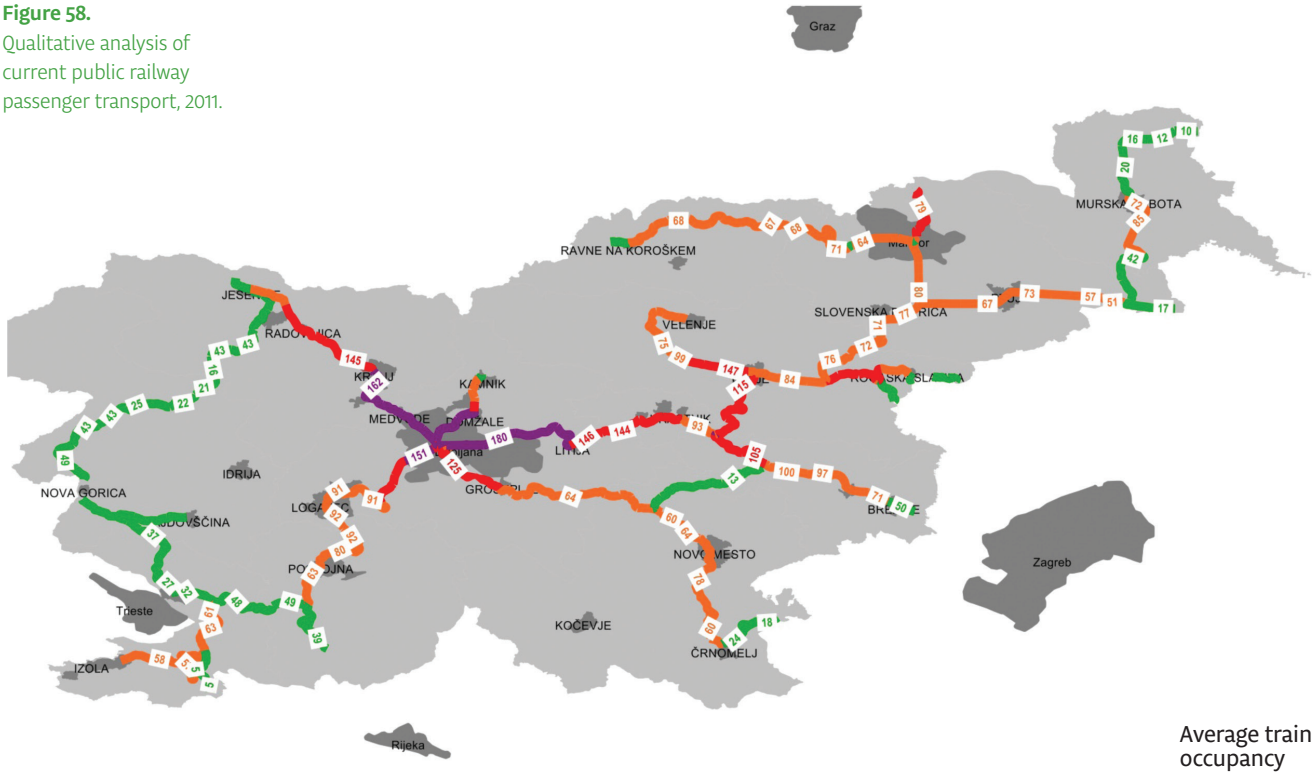
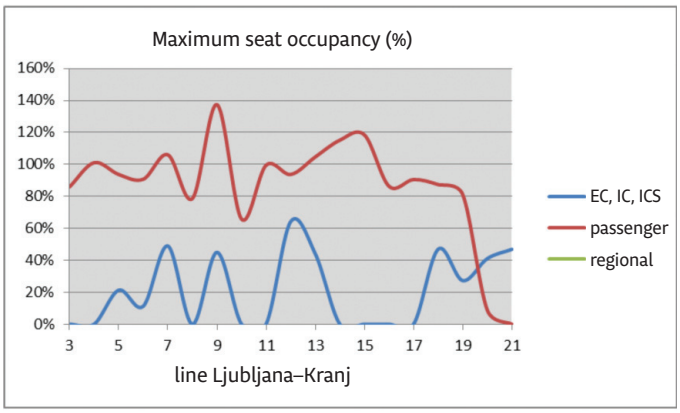


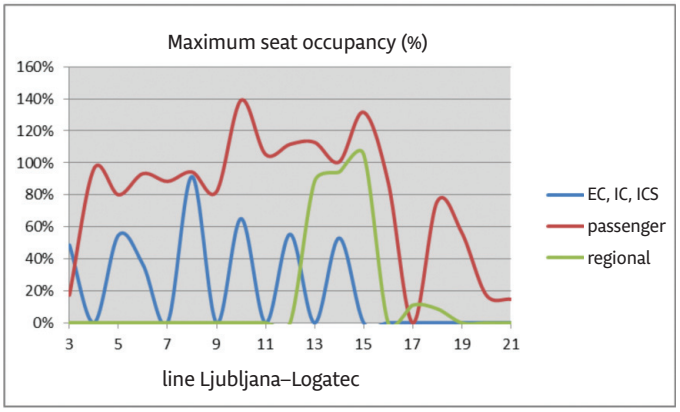
Figure 58 displays five graphs illustrating the occupancy of seats by hours of a day for individual types of trains, i.e. on the sections Ljubljana–Kranj, Ljubljana–Kamnik, Ljubljana–Litija, Ljubljana–Grosuplje and Ljubljana–Logatec. The graphs reveal that there are more passengers on trains than there are available seats at peak hours in all directions, particularly on local and regional trains, which means that the level of comfort and service is poorer at these times, making this transport mode less attractive.

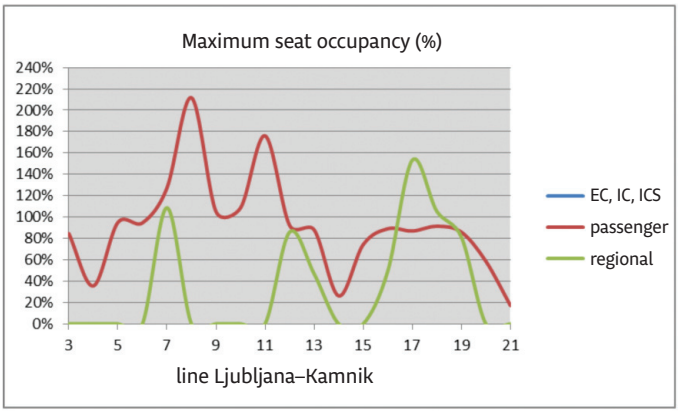
Figure 58.
Qualitative analysis of current public railway passenger transport, 2011.

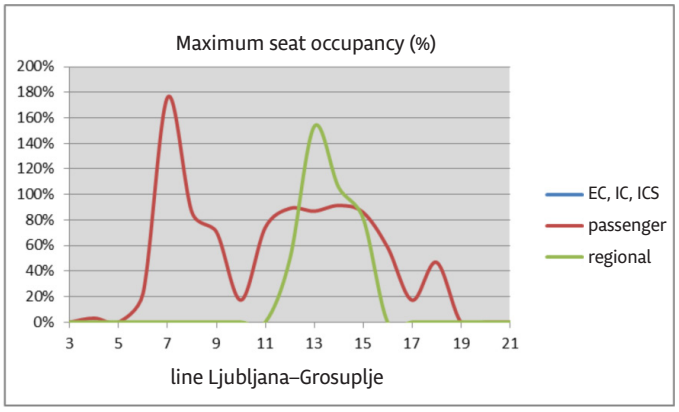


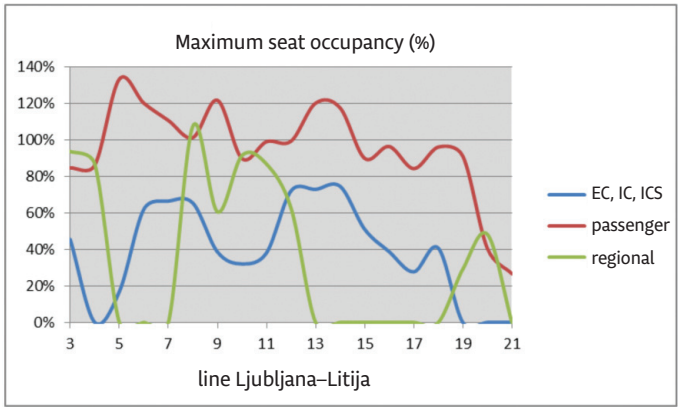
Note: on sections where the value exceeds 100% (highlighted in purple and dark red), the comfort of the trip is unacceptably low.







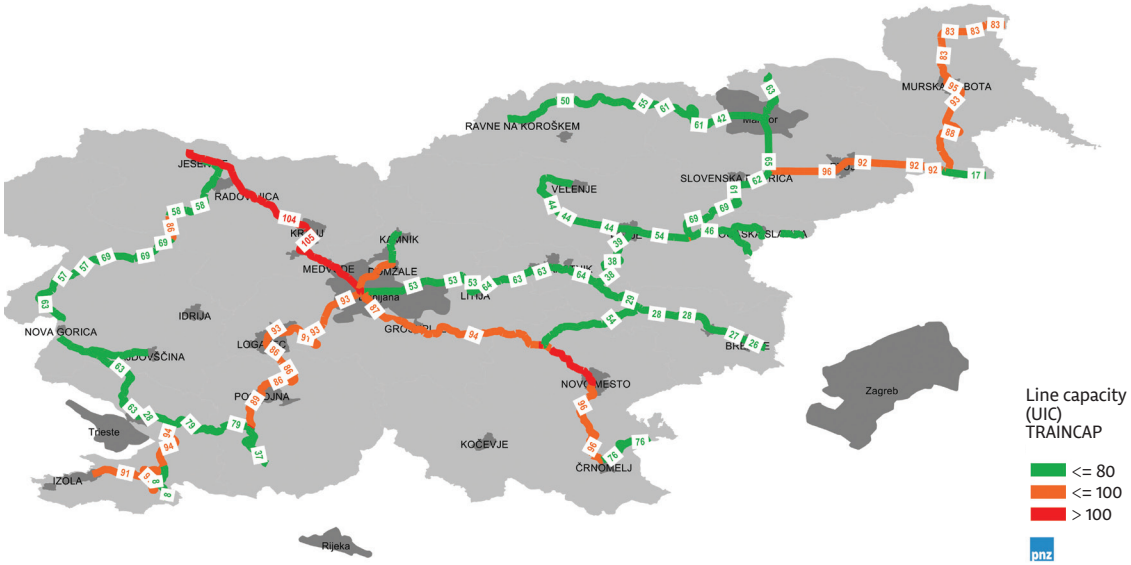




The railway system is problematic in terms of both passenger and goods transport. Figure 58 shows that comfort on journeys especially outside Ljubljana is unacceptably low due to the insufficient frequency of service. Therefore, public rail passenger transport in this area is less attractive.

Figure 59 shows the current exploitation of the railway network capacity by taking into account all passenger and goods trains. The figure shows that the most problematic line in terms of capacity is the Gorenjska line (including the Ljubljana hub), followed by the Koper–DIvača, Pivka–Ljubljana and Pragersko–Hodoš lines; the modernisation of the latter is in progress and will be completed in 2015. All these lines are included in either the main line category or the TEN-T network. Among the regional lines, part of the Kamnik line and almost the entire Dolenjska line pose a problem.

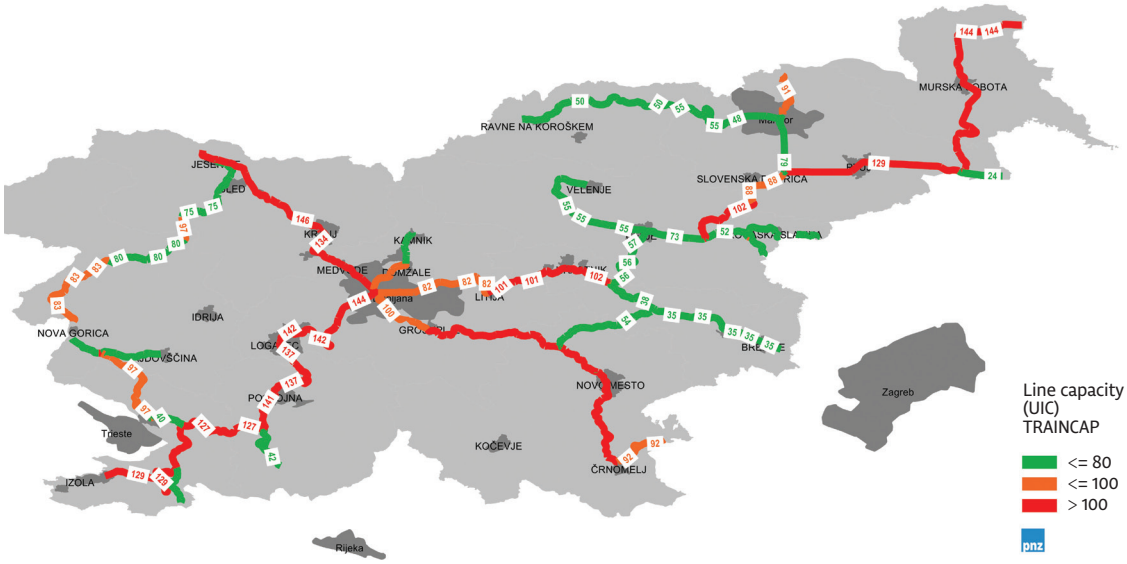
Figure 59.
Capacity utilisation of the current railway network, 2011.



Note: problematic sections are highlighted red.

The quantity of transport, especially goods transport, will increase in any case. Therefore, even if the transport options on the majority of the Slovenian railway network remain unchanged in the future, the capacity will be exceeded, despite the fact that a significant share of goods transport would bypass Slovenia and move onto roads.

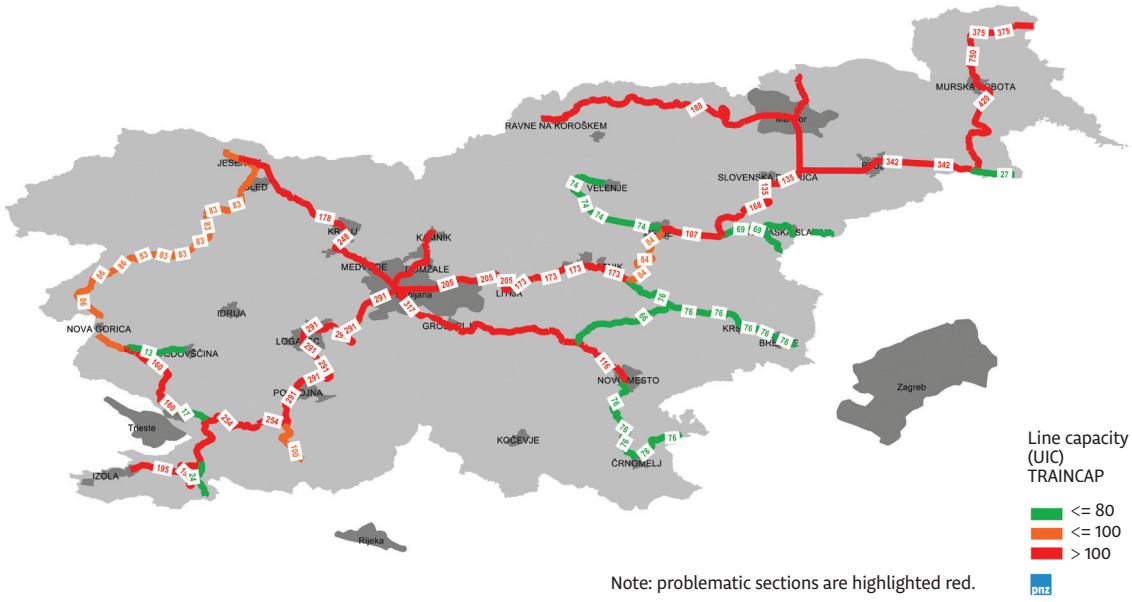
Figure 60.
Capacity utilisation of the current railway network in 2030 while taking into account the current traffic arrangements in Slovenia and in its surroundings



Note: problematic sections are highlighted red.

The change in mode choice and greater role of railways require the construction of a modern railway network. If the fact that the network defined as the TEN-T network in Slovenia and around it will be regulated in accordance with standards applicable to this network is taken into account, demand on the Slovenian railway network will be considerably higher. In this case, the capacity of all lines on the TEN-T network and some regional lines would be exceeded.

Figure 61.
Capacity utilisation of the current railway network in 2030 while taking into account possible demand if the railway network in Slovenia and neighbouring countries meet the TEN-T standards



Note: problematic sections are highlighted red.

If there are no investments to improve the railway transport service by 2030, capacity will be exceeded on the following sections:

main lines:
- Ljubljana, Zidani most, Divača, Pragersko hubs,
- Koper–Divača (single track),
- Divača–Ljubljana,
- Jesenice–Ljubljana (single track),
- Pragersko–Hodoš (single track),
- Ljubljana–Zidani Most,
- Zidani Most–Pragersko,
- Pragersko–Maribor,
- Maribor–Šentilj (single track).

regional lines:
- Ljubljana–Novo mesto,
- Prvačina–Sežana,
- Kamnik–Ljubljana,
- Dravograd–Maribor.

Almost all main lines, i.e. almost the entire TEN-T network, and some regional lines which should have an important role in passenger transport present bottlenecks.

Almost none of the entire network of main lines or the TEN-T network allows for speeds of 100 km/h or more. Only the Pragersko–Maribor section allows for speeds over 100 km/h, and certain individual sections, such as Ljubljana–Litija, Sevnica–Dobova, Kranj–Ljubljana, Celje–Grobelno, Pragersko–Središče–state border, Murska Sobota–Hodoš–state border and Borovnica–Ljubljana. The regional network as a whole does not allow for such speeds.

The realistic speeds are significantly lower than those declared, since so-called slow zones occur frequently due to extraordinary events, poor track conditions, defects, etc. For example, slow zones were introduced on 14 sections of main lines in 2012, where speeds were reduced by 30–70%.[43]

43: Report on the current conditions of slow zones on Slovenian railways, Slovenske železnice–Infrastruktura, d.o.o., Ljubljana, January 2013.

Important sections of main lines or the TEN-T network do not allow for an axle load of 22.5 t/axle, i.e.:

- Zidani Most–Celje,
- Maribor–Šentilj.

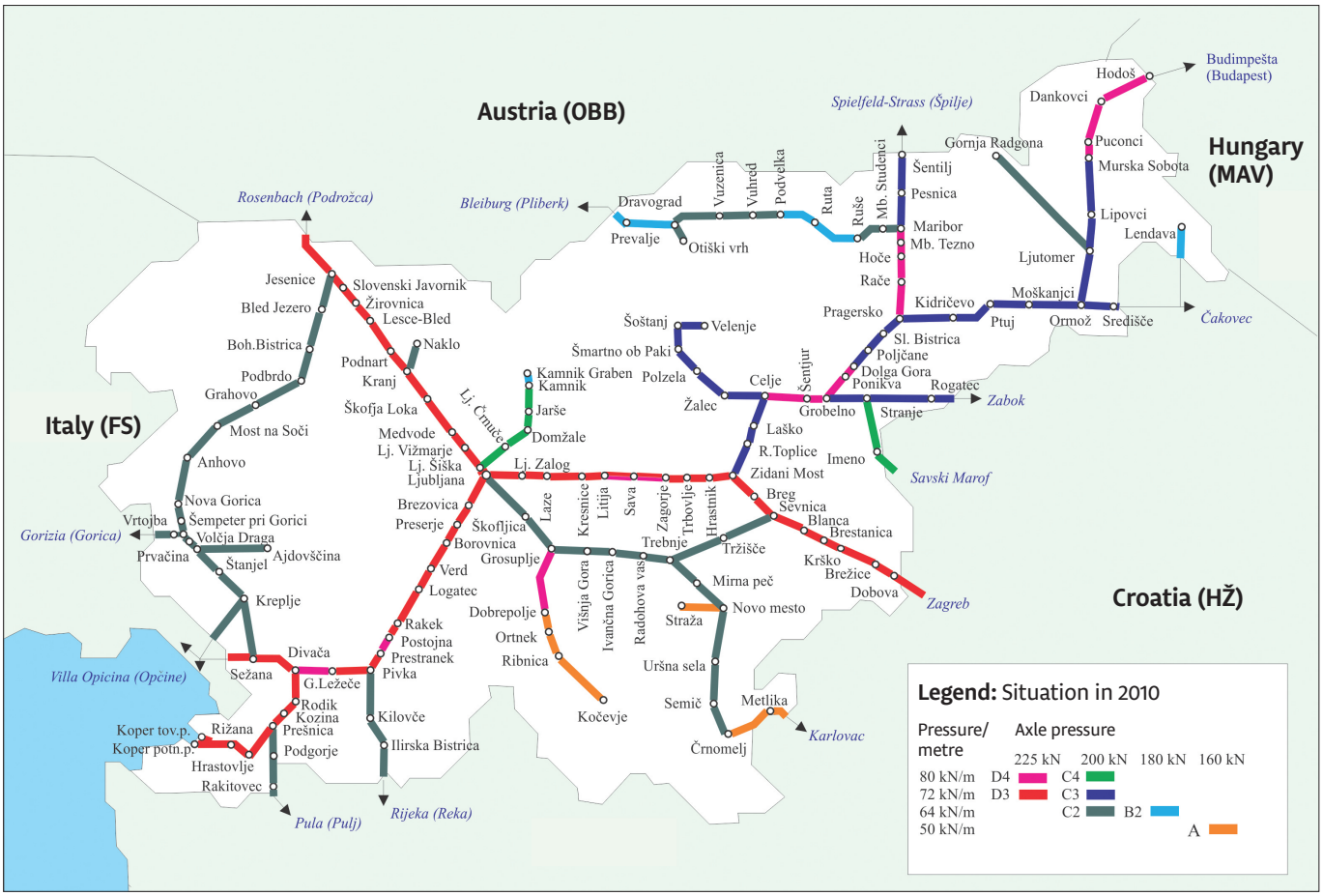
The modernisation of the Pragersko–Hodoš and Dolga Gora–Poljčane lines is in progress.

Such a load-bearing capacity is also not permitted on any regional line (except on the modernised line towards Kočevje to the Ribnica station).

The completion of the projects in progress will see all main lines or the lines on the TEN-T network electrified, while no regional line is electrified.

Conditions are already poor and continue to deteriorate, which is shown in increased delays and reduced travel speeds, especially of goods transport. In passenger transport, the average delay is approximately 2.8 minutes per 100 train kilometres, while travel speed is approximately 51 km/h. For the moment, these values are neither worsening nor improving in passenger transport. Goods transport poses a greater problem. The average delay in 2009 was 39.6 minutes per 100 train kilometres, while in 2010 it had already reached 78.8 minutes per 100 train kilometres. In the same period, travel speed declined from 28.8 km/h to 24.4 km/h.

Figure 62.
Load-bearing capacity of railway tracks



Note: insufficient load-bearing capacity is highlighted blue.

Figure 62 shows the load-bearing capacity of railway tracks. The required axle load of 22.5 t/axle is not ensured throughout the entire TEN-T network (highlighted blue), which reduces the capacity of the system and prolongs driving times.

Desired state:

- The capacity of the Slovenian railway network, especially the core and comprehensive TEN-T networks, must be able to handle future demand based on the extraordinary potential of the Slovenian area, which has pan-European significance.
- The core TEN-T network must meet the minimum standards of this network, i.e. all lines must be electrified, and they must enable goods trains with a length of 740 metres, a load-bearing capacity of 22.5 t/axle and a speed of at least 100 km//h.

Actual state:

- The frequency of the service and comfort of passengers on more burdened lines is unacceptably low.
- Almost the entire TEN-T network is a bottleneck, and as such does not facilitate the required capacity and suitable reliability of the timetable.
- Following the completion of works on the Pragersko–Hodoš line, the core TEN-T network will be fully electrified. It only partially facilitates the use of 740 m long trains, does not allow for an axle load of 22.5 t/axle on all sections, and most lines do not allow for a speed of 100 km/h.

Finding:

- The core and comprehensive TEN-T networks in Slovenia do not ensure the required capacity and acceptable comfort of passengers.
- The core and comprehensive TEN-T networks in Slovenia do not ensure minimum TEN-T and TSI standards.

Proposed measures

The Slovenia railway system requires complete renovation. All sections of the TEN-T network must be modernised and upgraded by 2030. If necessary, new structures must be built.

The required minimum standards must be met throughout the entire core TEN-T network. For the future arrangement of the TEN-T lines, the TSI V–M standard must be introduced and the length of trains of 740 m must be allowed.

The following measures must be realised:

- electrification of the entire Slovenian railway network;
- introduction of the ERTMS (ETCS level 2) throughout the entire main or TEN-T network;
- modernisation, upgrading and new construction on the TEN-T and regional networks.

4.4.3.2 Roads and parking for trucks

The situation on the current road network was analysed, i.e. during afternoon peak hours on an average working day and in a tourist peak period by 2030. It was established that the capacity of certain roads will be exceeded by 2030 even if a modern and competitive railway system is constructed, and high-quality public passenger transport is introduced, i.e.:

- western, northern, southern and eastern Ljubljana bypass,
- Ljubljana–Brezovica–Vrhnika–Postojna motorway,
- Ljubljana–Domžale motorway,
- Ljubljana–Grosuplje motorway,
- Draženci–Gruškovje,
- Medvode–Ljubljana,
- Jagodje–Lucija,
- Lesce–Bled,
- Škofljica–Ljubljana,
- western section of Maribor,
- area of Nova Gorica,
- Kranj–Mengeš,
- area of Kranj,
- Krško–Brežice,
- Dramlje–Šentjur,
- Koper–Dragonja,
- Velenje–Arja vas,
- Celje–Laško,
- area of Novo mesto,
- area of Murska Sobota,
- area of Ptuj, and
- Postojna–Pivka (in tourist season).

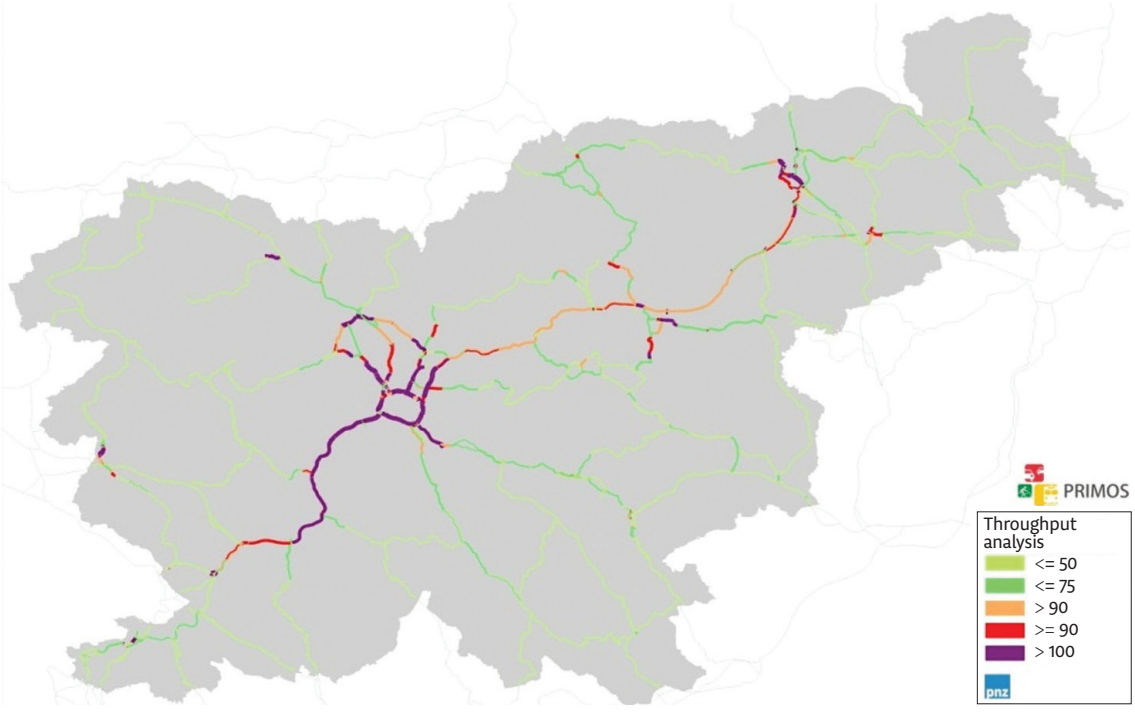


Figure 63.
Roads exceeding capacity during afternoon peaks in 2030 (marked purple)

Figure 64.
Roads exceeding capacity during tourist peaks in 2030 (marked purple)

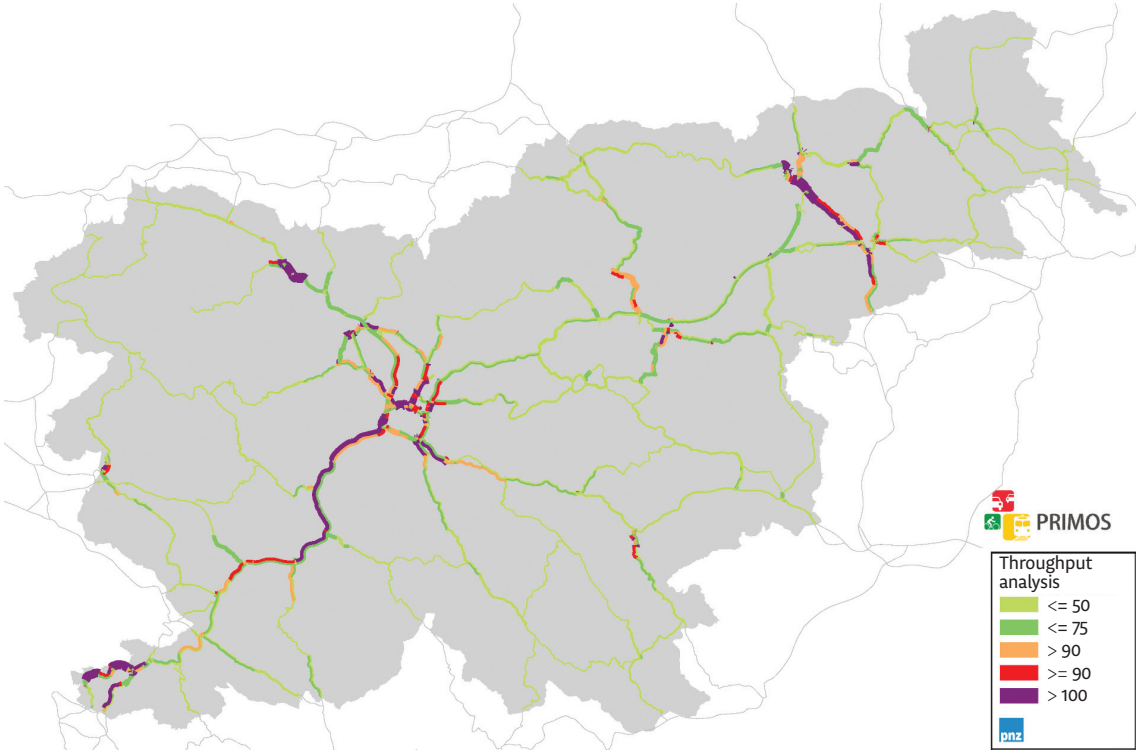
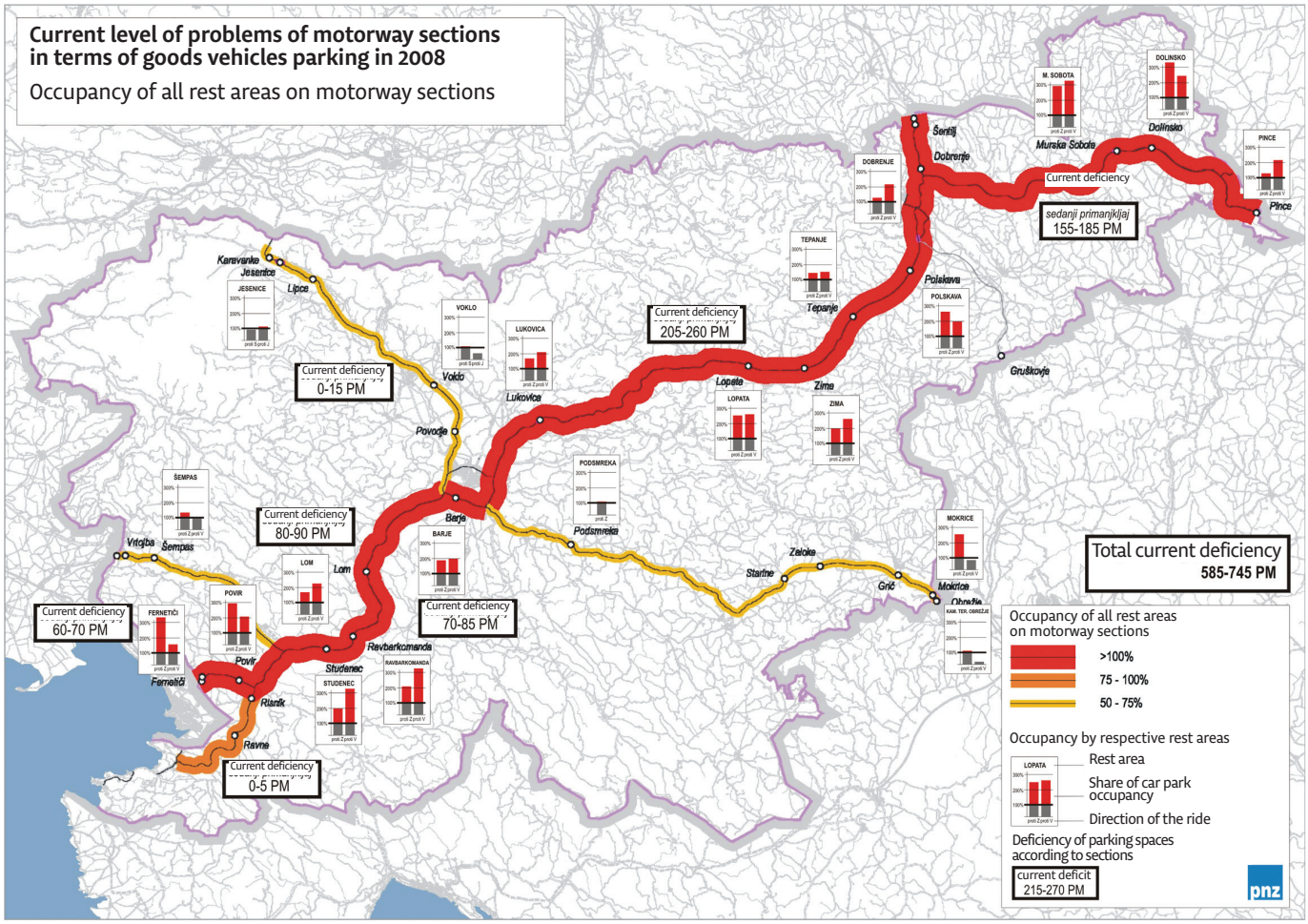


Figure 65.
Parking space shortage at rest areas for heavy goods vehicles in 2008

Capacity will have to be increased where it is exceeded (highlighted in purple). The capacity of these roads would also be exceeded even if rail and public transport were to play a greater role.

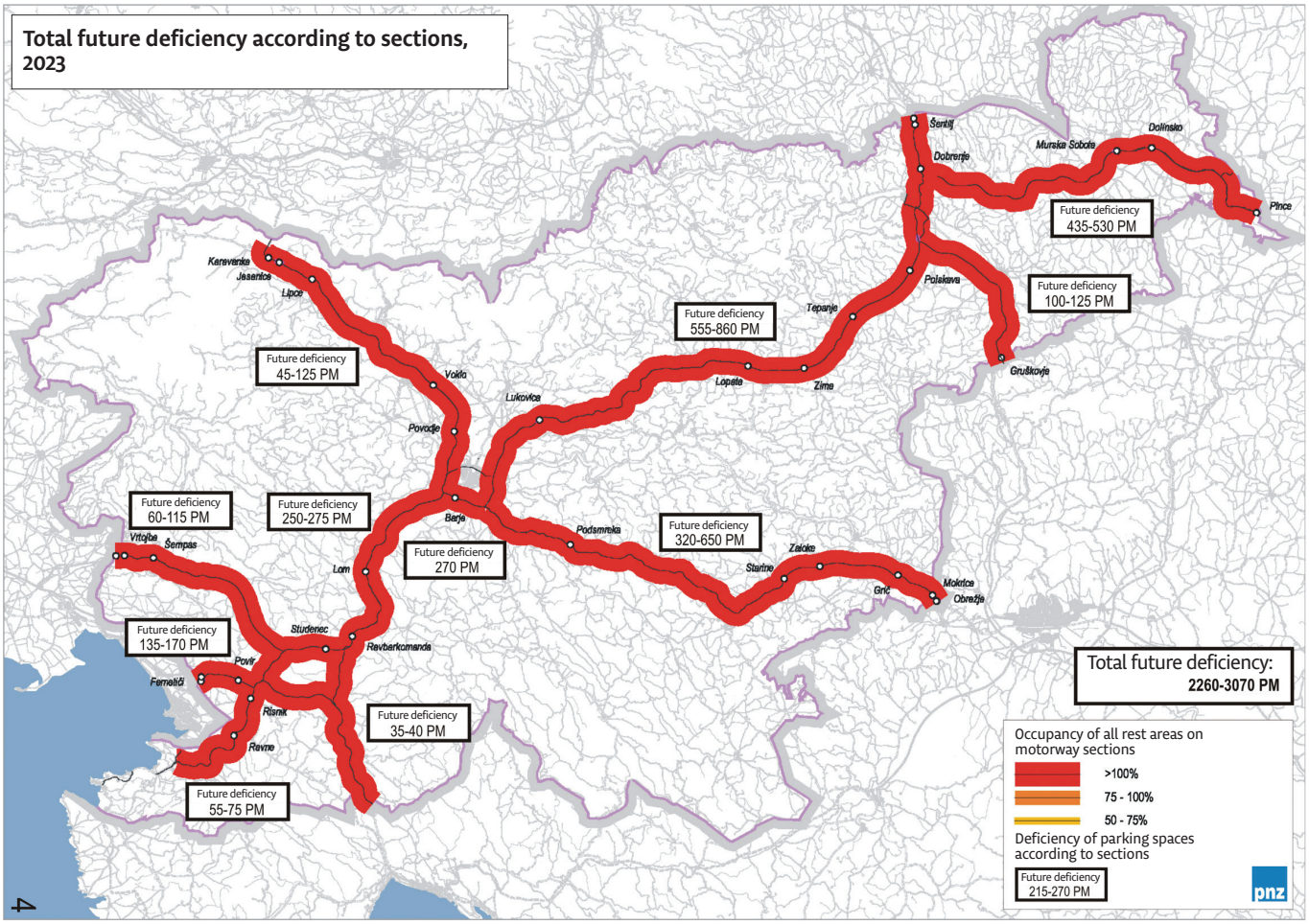


There is a great shortage of parking areas for heavy goods vehicles along Slovenian motorways. It was established[44]:

- in 2008, there was a shortage of 600 to 700 parking spaces; almost the entire shortage is within the Mediterranean Corridor Fernetiči/Koper–Ljubljana–Šentilj/Pince;
- in 2023, there will be a shortage of 2,000 to 3,000 parking spaces, of which 75% will be within the Mediterranean Corridor.

44: A study on ensuring parking areas for haulage vehicles along Slovenian motorways and expressways, PNZ, 2009.

Figure 66.
Parking space shortage at rest areas for heavy goods vehicles in 2023



Desired state:

- Demand should be lower or equal to supply (v/c < 1); when demand exceeds supply, congestion occurs on roads, which means a loss of time, money, and more exhaust gases and noise pollution.
- A sufficient number of parking spaces must be available for drivers to carry out their tasks normally, abide by the regulations on traffic limits and road-traffic safety, and not endanger other road users.

Actual state:

- Despite the modernisation and establishment of a more efficient railway system, the organisation of more competitive public transport, and the establishment of the P+R system in Slovenia by 2030, capacity will be exceeded on approximately 230 kilometres of roads.
- Even if investments in railways change mode choice in favour of rail transport, there will still be a shortage of at least 2,000 parking spaces on motorways and expressways.

Finding:

- Despite the introduction of a sustainable transport policy, the Slovenian road network will still present inconsistencies between demand and supply, and bottlenecks on the more important road network, which will produce congestion and thus related negative consequences. Therefore, this situation must be defined as problematic.

- Poor conditions in parking areas for lorries will become even worse, which will further worsen the problem.

Required measures

Bottlenecks and congestion on roads must be eliminated, i.e. the capacity of road sections with problems must be improved.

Capacity will be improved by:

- introducing ITS, especially on motorways, to exploit existing roads better;
- expanding roads;
- constructing bypasses, and
- new construction.

In addition, the lack of parking areas for lorries must also be improved. This will be done by:

- introducing the ITS system in order to ensure steady occupancy of all parking areas (1st measure of ITS) and more intensive use of parking areas (2nd measure of ITS);
- establishing new parking areas.

These measures will eliminate problems on roads and in parking areas for lorries.

4.4.3.3 Public passenger transport

4.4.3.3.1 Public passenger transport system in Slovenia

The public passenger transport system in Slovenia is fragmented and not managed comprehensively. It is divided into three sub-systems:

1. interurban line bus passenger transport carried out by concessionaires as a public utility service;
2. rail passenger transport carried out by Slovenske železnice as a public utility service;
3. urban line passenger transport.

Each sub-system is organised differently, and there is no uniform public passenger transport manager to manage or direct the entire field of public passenger transport by managing all the transport needs of passengers and adjusting public passenger transport options to them, as well managing the entire financial and technical field (uniform electronic ticket, financial flows and settlements between carriers, and supervision of the implementation of the system). Some 88.142 million passengers were transported by all carriers in 2013. In 2013, the number of passengers grew in all three sub-systems, and the long-running decline in the number of passengers transported ended. EUR 51,529,254 million were ensured from public funds to implement the public utility service of rail passenger transport in 2013; EUR 20,679,108 million were ensured for compensation for the public utility service of interurban passenger transport by buses, and EUR 18 million (estimate) were ensured for the implementation of urban line passenger transport.

The public utility service (PUS) in interurban road transport is carried out by 36 concessionaires, which are privately held companies, except for Javno podjetje Ljubljanski potniški promet. In order to carry out the PUS, the concessionaires sign a contract with the state (ministry responsible for transport) based on the number of kilometres travelled and flat rate costs per kilometre. Flat rate costs per kilometre travelled are determined on the basis of expert analyses which take into account the costs of vehicles, amortisation, labour costs, fuel and the company, and financing, including profit attributable to a well-managed company. The norm price changes in accordance with the movement of costs, and negotiations between concessionaires and the state.

The state provides the concessionaires the payment of maximum compensation, which is the difference between flat rate costs per kilometre and total income earned by the concessionaires by passenger transport. However, the compensation has an upper limit, which is an average of 26% of the norm price. Income earned by concessionaires in the market is both private (payment for passenger transport and baggage, payment for advertising services in means of transport, contracts with companies) and public (subsidies exercised by beneficiaries for the subsidised transport of secondary school and university students, subsidies of local communities to maintain non-profitable lines or for above-standard connections).

The public utility service in internal rail transport is carried out by Slovenske železnice on the basis of a contract with the Ministry of Infrastructure. Some 15.6 million passengers were transported by SŽ Potniški promet in 2013. The Contracting Authority of the public utility service provides the funds for implementing passenger transport and co-finances it in the amount of EUR 4.5291 (including VAT) per train kilometre travelled. In 2013, income of EUR 40.6 million was realised on the basis of a contract with the Ministry of Infrastructure (an instalment paid for insufficiently paid compensations for the PUS for the period between 2003 and 2009 amounted to EUR 10.8 million).

Urban line passenger transport is the responsibility of local communities and is carried out in 17 local communities. Pursuant to the Road Transport Act, urban passenger transport must be organised and carried out by all municipalities with over 100,000 residents, while other local communities may carry it out in order to improve population mobility. The most important part of this sub-system is organised in Ljubljana, where public line passenger transport is carried out by Javno podjetje Ljubljanski potniški promet (LPP) as a mandatory public utility service; it transports 42 million passengers annually. The system in Maribor is organised in a similar manner (it was reorganised in 2011), while the availability of other towns' urban passenger transport is significantly lower and is subsidised. The municipalities of Murska Sobota, Nova Gorica and Velenje offer free urban passenger transport.

Road passenger transport

Public line transport is road passenger transport between bus stations, important bus stops and bus stops along a certain line according to a timetable, general transport conditions and price list. Thus, this is passenger transport available to everyone under the same conditions and is carried out with a certain frequency along predetermined routes in Slovenia. During the journey, passengers may board or alight at predetermined stops. Public line passenger transport, except urban transport and transport of primary school pupils, is ensured by the state as a public asset through public utility services.

Table 3.23: Road passenger transport in Slovenia between 2002 and 2011

	Year	number of passengers transported (in 1,000)	Annual increase in the number of passengers transported (in %)	Passenger kilometres (in 1,000 km)	Annual increase in passenger kilometres (in %)
	2005	39,759		862,015	
	2006	37,964	–4.5	850,266	–1.4
	2007	38,532	1.5	817,116	–3.9
	2008	38,751	0.6	814,836	–0.3
	2009	36,720	–5.2	776,737	–4.7
	2010	34,720	–5.4	733,204	–5.6
	2011	32,404	–6.3	702,384	–4.2
Average annual growth in %		**/**	**–3.4**	**/**	**–3.2**
Total growth in %		**/**	**–18.5**	**/**	**–18.5**

Note: only road public line transport, excluding urban transport and transport of passengers by taxis.

Source: Statistical Office of the Republic of Slovenia, June 2014 (The data for the period between 2002 and 2011 were collected on the basis of the old methodology).

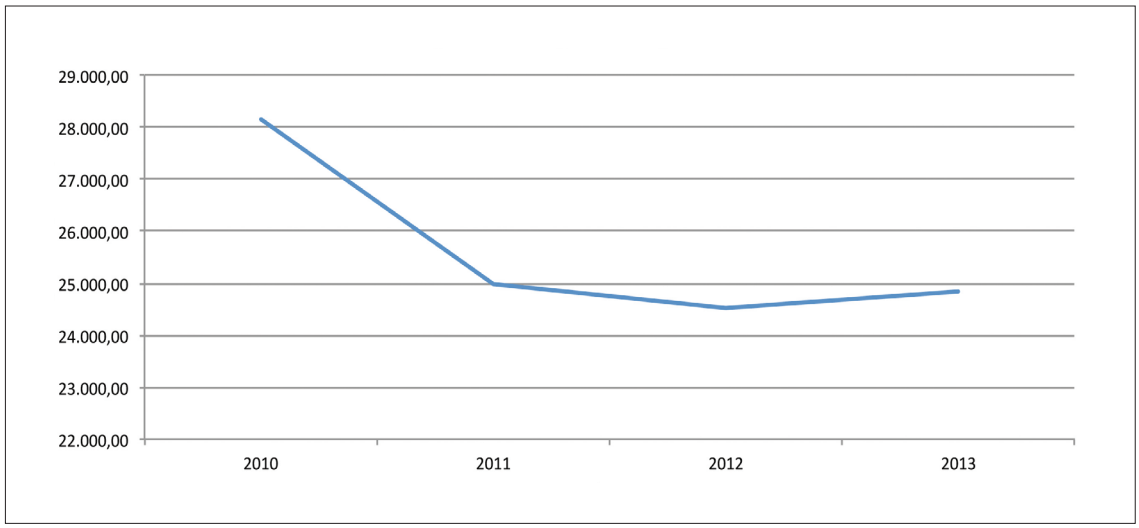
Between 2005 and 2011, the number of passengers transported by road public line passenger transport declined from 40 million to 32 million or by 18.5%. Passenger kilometres declined by the same amount (18.5%). The long-running decline in the number of passengers in public bus line transport continued during the entire observed period from 5 to 6% annually. The decline in the number of passengers came to a halt in 2012, when a new system of subsidised transport for secondary school and university students was introduced, which ensured a minimum increase in the number of passengers transported in 2013. The introduction of bargain prices of tickets for beneficiaries of subsidised transport showed that suitable measures in pricing policy for monthly tickets and minimum harmonisation of timetables may halt the constant decline in passenger numbers and lay the foundations for reorganising the public passenger transport system.

Table 3.24: Road passenger transport in Slovenia between 2011 and 2013

Year	Number of passengers in 1.000)	Annual increase in the number
2010	28,148	
2011	24,968	–11.3
2012	24,523	–1.8
2013	24,828	1.2

Note: only road public line transport, excluding urban transport and transport of passengers by taxis.
Source: Statistical Office of the Republic of Slovenia, June 2014 (The data for the period between 2011 and 2013 were collected on the basis of the new methodology which takes into account the number of passengers recorded in electronic systems).

Figure 67. Number of passengers transported in interurban bus transport



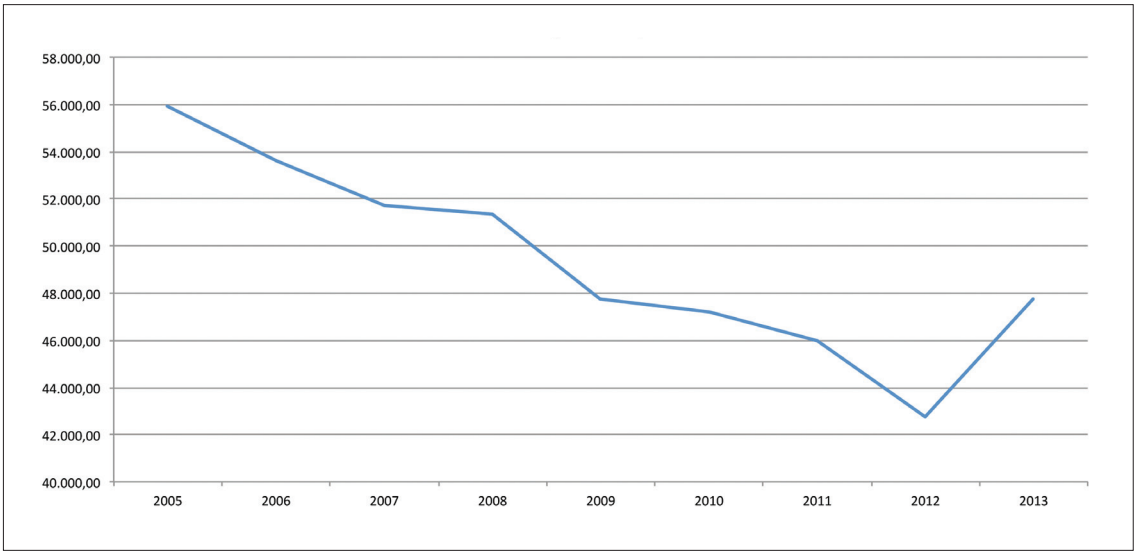
The number of passengers transported in urban passenger transport also declined between 2005 and 2013. It dropped from 55.9 million to 47.7 million, which is 14.6% of the total decline in the number of passengers transported The increase in the number of passengers in 2013 was the result of the introduction of a modified system of subsidised tickets, which also facilitates subsiding tickets for urban transport if a passenger is entitled to urban transport due to the distance between an educational institution and bus or train stations or stops, and also of the arrangement of the entire transport field with more consistent supervision, reporting and electronic recording of passenger numbers. In 2013, the declining trend in passenger numbers ended, and the offer was improved, since 19.1% more kilometres were travelled than in the previous year and more than in any year in the observed period. Most kilometres in urban transport are travelled by LPP, which covered 17.04 million kilometres and transported 47.7 million passengers in 2013.

Table 3.25: Urban passenger transport between 2005 and 2013

Year	Number of passengers transported (in 1,000)	Annual increase in number of passengers transported (in %)	Km travelled (in 1,000)	Annual increase in km travelled (in %)
2005	55,937		15,813	
2006	53,604	–4.2	15,778	–0.2
2007	51,745	–3.5	15,759	–0.1
2008	51,336	–0.8	16,291	3.4
2009	47,748	–7.0	16,518	1.4
2010	47,210	–1.1	16,370	–0.9
2011	45,980	–2.6	14,990	–8.4
2012	42,760	–7.0	14,307	–4.6
2013	47,751	11.7	17,044	19.1
Annual growth in %	**/**	**–1.8**	**/**	**1.2**
Total growth in %	**/**	**–14.6**	**/**	**7.8**

Source: Statistical Office of the Republic of Slovenia, June 2014.

Figure 68. Number of passengers transported (in thousands) in urban passenger transport between 2005 and 2013



Rail passenger transport

Rail passenger transport ensures population mobility on the public rail infrastructure network, where, in addition to the core network lines, it is competitive with road passenger transport. Following the opening of new road sections, the number of passengers transported by rail did not decline as drastically as, for example, in interurban bus transport.

Table 3.26: Road passenger transport in Slovenia between 2005 and 2013

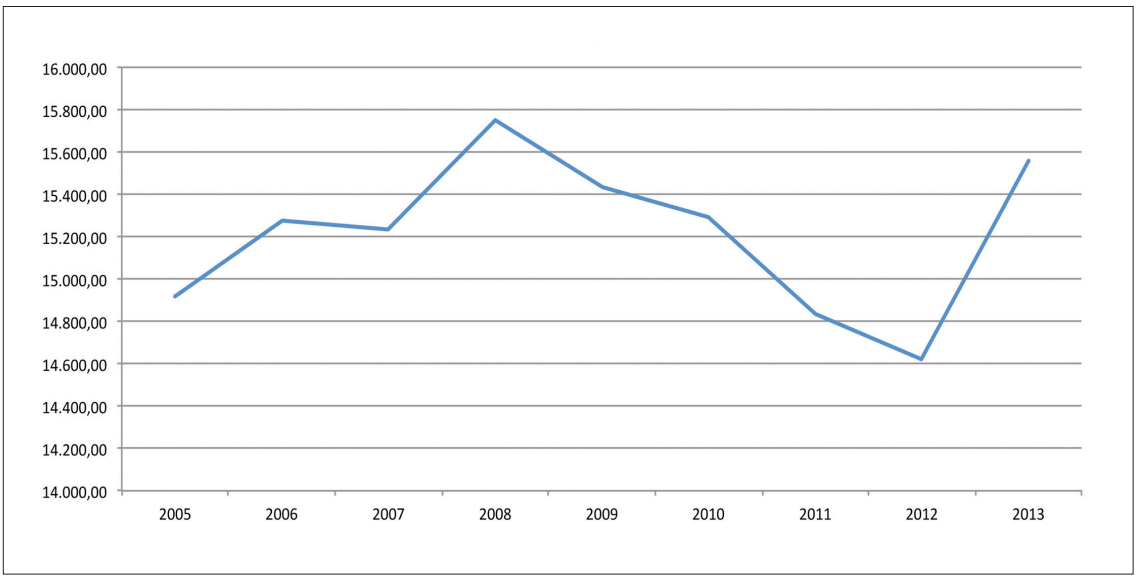
Year	Number of passengers transported (in 1,000)	Annual increase in number of passengers transported (in %)	Passenger kilometres (in million km)	Annual increase in passenger kilometres (in %)
2005	14.917		666,1	
2006	15.275	2,4	675,4	1,4
2007	15.232	–0,3	690,3	2,2
2008	15.753	3,4	712,7	3,2
2009	15.434	–2,0	717,5	0,7
2010	15.294	–0,9	679,5	–5,3
2011	14.838	–3,0	641,3	–5,6
2012	14.622	–1,5	614,0	–4,3
2013	15.563	6,4	635,7	3,5
Annual growth in %	**/**	**1,3**	**/**	**–0,1**
Total growth in %	**/**	**4,3**	**/**	**–4,6**

Source: Statistical Office of the Republic of Slovenia, June 2014 (these are the data for internal passenger transport).

The most important lines according to the number of passengers transported and the annual number of passenger trains are lines no. 10 state border–Dobova–Ljubljana, no. 30 Zidani Most–Šentilj–state border and no. 20 Ljubljana–Jesenice–state border, where over one million passengers were transported on individual sections.

The most passengers (over 5.3 million annually) in the observed period departed from stops on line no. 10 state border–Dobova–Ljubljana (the line includes the Ljubljana station). Between 3.1 and 3.3 million passengers departed from stops on line no. 30 Zidani Most–Šentilj–state border, while between 1.5 and 2.0 million passengers departed from stops on line no. 20 Ljubljana–Jesenice.

Figure 69.
Number of passengers transported in internal rail transport in 1000



4.4.3.3.2 Public passenger transport modes

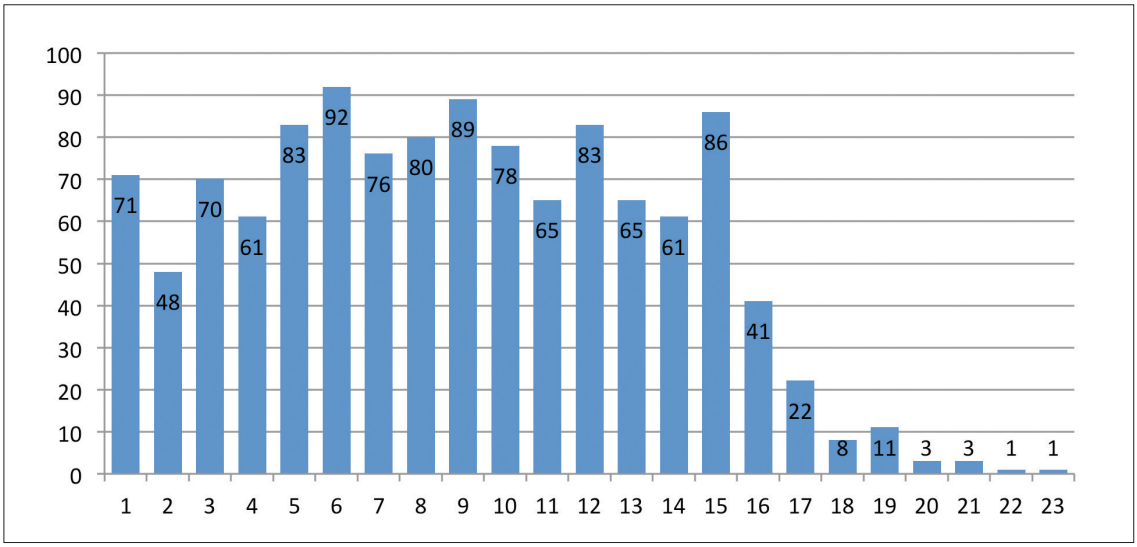
This sub-chapter shows transport modes in view of the following subsystems:

1. interurban line bus passenger transport,
2. rail passenger transport,
3. urban line passenger transport.

Interurban line bus passenger transport

Interurban line passenger transport is carried out by 36 concessionaires with 1,198 vehicles. The latter include vehicles which are used by the carrier to execute the public utility service, and vehicles which must be in reserve in accordance with the concession contract to ensure additional services if the number of passengers at a departure is higher than the permitted number of passengers considering the vehicle type-approval and legislation, or if defects or any other problems occur, so that the PUS is carried out in accordance with the timetable. The transport modes proposed by carriers for 2014 are relatively old, as their average age is 8.84 years. Between 40 and 90 vehicles are 1 to 16 years old, while 49 vehicles are older than 16 years. Some 302 vehicles have exceeded the amortisation period of 12 years, which is taken into account in the costs for the compensation calculation for the implementation of the PUS. The display of the numbers of vehicles by years show that concessionaires have replaced fewer vehicles in the last four years (especially in 2012) than in previous years.

Figure 70.
Number of vehicles used to carry out interurban line bus passenger transport by vehicle age in years

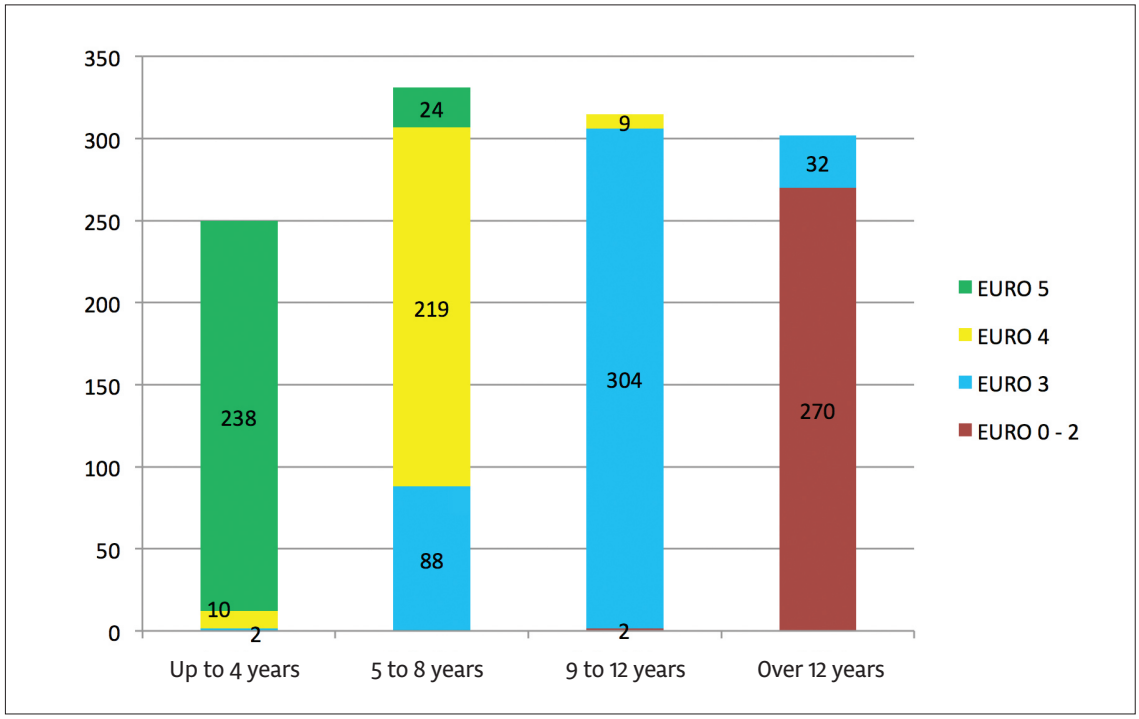


Regarding vehicle engines, 282 vehicles are environmentally completely unacceptable, as their engines are in the EURO 0, EURO 1 and EURO 2 categories. Most vehicle engines are in EURO 3, and only 262 engines in EURO 5 or EURO 5EEV. In 2014, no vehicles were proposed with EURO 6 engines or alternative fuel vehicles (CNG or electrical buses). The relatively old age of vehicles poses a problem not only from the aspect of excessive burdening of the environment, but also comfort and a suitable offer for passengers using public transport. The concessionaires travel between 40,000 and 60,000 kilometres annually with one vehicle for the implementation of the PUS, which means that vehicles are being used that have travelled over 500,000 kilometres.

Table 3.27:
Number of vehicles used to carry out interurban line passenger transport considering the age and environmental characteristics of engines

EURO categories	Up to 4 years	5 to 8 years	9 to 12 years	Over 12 years	Total
EURO 0–2			2	270	272
EURO 3	2	88	304	32	426
EURO 4	10	219	9		238
EURO 5	238	24			262
Total	**250**	**331**	**315**	**302**	**1.198**

Figure 71.
Display of the number of vehicles used to carry out interurban line passenger transport



The new call for granting concessions anticipates that concessionaires replace all vehicles with EURO 3 engines or less by 2020 and that at least 20% of vehicles used to implement the PUS will be electrically or CNG powered.

Rail passenger transport

To ensure competitive rail passenger transport, modern, safe, economical and reliable rolling stock is essential. Local passenger trains comprise 88% of the trains offered by Slovenske železnice. Regional trains' share is only 3%, and ICS and international trains' share is slightly lower than 5%. The condition of transport modes used to carry out local rail passenger transport is thus crucial for the offer to be suitable. In 2011, 77.8% of all passengers transported were workers or secondary school and university students, i.e. daily commuters (including passengers on regional lines). The group of secondary school and university students is the best represented. In 2011; they accounted for between 39 and 52% of passengers in internal transport (interurban and local or suburban transport, except ICS trains), while workers accounted for almost a third.

The rolling stock of SŽ–Potniški promet has a total of 223 maintained vehicles, of which 121 are traction stock and 102 carriages. Slightly more than half of the vehicles are traction stock, i.e. 8 electric and 4 diesel locomotives, and 39 electric and 70 diesel sets. More than half of the carriages, i.e. 64, are type B (2nd class seats), 1 carriage is type A (1st class seats); 30 carriages or slightly less than a third are type AB (1st and 2nd class seats).

Table 3.28: SŽ–Potniški promet rolling stock

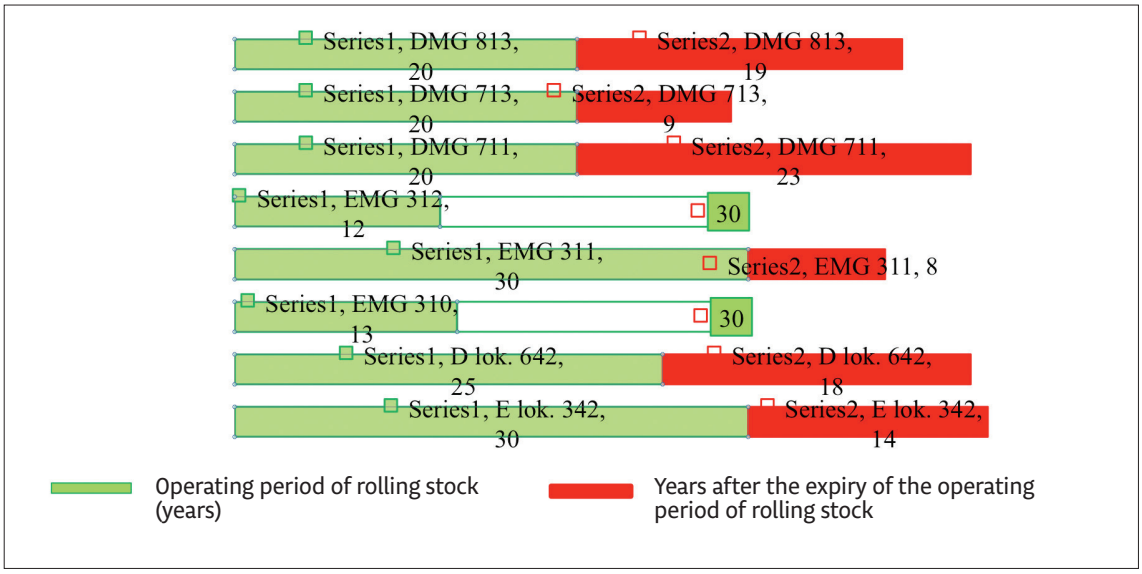
SŽ–Potniški promet rolling stock	Number of rolling stock	Operating period of rolling stock (years)	Average age (years)	Maximum speed (km/h)
TRACTION STOCK	**121**			
Locomotives	**12**			
Electric locomotives 342	8	30	44	120
Diesel locomotives 642 (shunter)	4	25	43	80
EMG	**39**			
310	3	30	13	200
311	6	30	38	110
312	30	30	12	140
DMG	**70**			
711	6	20	43	120
713/715	25	20	29	120
813/814	39	20	39	100
CARRIAGES	**102**			
Type B (2nd class seats)	2+62			
Type A (1st class seats)	1			
Type AB (1st and 2nd class seats)	30			
Type WR (restaurant carriage)	5			
Type D (baggage carriage)	2			
TOTAL MAINTAINED ROLLING STOCK	**223**			

Source: Institute of Traffic and Transport Ljubljana, 2013, Verification of technical characteristics of PRI in the Republic of Slovenia from the aspect of purchasing new rolling stock SŽ–Potniški promet, d.o.o.

The most numerous and the newest electric sets are of the 312 series (Siemens Desiro), of which 10 have two units and 20 have three units. The average age of EMG of the 312 series is 12 years, while the average age of 3 EMG of 310 series is 13 years. 6 EMG of the 311 series are the oldest, i.e. the average of 38 years.

The rolling stock of SŽ–Potniški promet includes a total of 4 diesel and 70 diesel engine traction stock, all of which are maintained. The average age of diesel locomotives of the 642 series and DMG 711 is 43 years, while the DMG 813 locomotives are slightly newer (average of 39 years) and were renovated between 1988 and 2002 (they were renovated from the 0 series to the 100 series, except 8 DMGs). DMG 713 are the newest, with an average age of 29 years.

Figure 72.
Operating period of rolling stock and display of the expiry of this period



Source: Institute of Traffic and Transport Ljubljana, 2013, Verification of technical characteristics of PRI in the Republic of Slovenia from the aspect of purchasing new rolling stock SŽ–Potniški promet, d.o.o.

The condition of the SŽ–Potniški promet rolling stock neither facilitates a suitable offer on the electrified and modernised Pragersko–Hodoš line nor ensures the preservation of the existing rail passenger transport options. The optimal development of transport infrastructure anticipates 30% growth in the number of passengers in public passenger transport, with which the objectives of sustainable mobility and less investments in the development of road infrastructure could be attained. In accordance with the expected number of passengers transported, the electric sets of the 312 series will have to be rearranged following the electrification of the Pragersko–Hodoš line, as further service on this line with diesel sets and classic trains is not logical.

From the aspect of replacing the withdrawn EMG 311, the new electrification of the Pragersko–Hodoš line, and the ensuring of the required seat capacity, the purchase of 10 new two-level EMGs is well-justified. Most occupied trains are on routes in the wider area of Ljubljana, Celje and Maribor, where the need for more seating on trains is the greatest; therefore, the purchase of new two-level EMGs which are expected to run on the following routes is necessary: Ljubljana–Kranj–Jesenice, Ljubljana– Logatec–Postojna, Ljubljana–Litija, and Maribor–Pragersko–Celje.

Thus 5 new DMGs will partially replace the withdrawal of 8 DMGs of the 813-0 series (the electrification of the Pragersko–Hodoš line will eliminate the need for DMGs) and improve the offer on the most frequent lines: 21 Ljubljana Šiška–Kamnik Graben and 80 Ljubljana–Metlika–state border (new DMGs with more seats). In addition to replacing the withdrawn DMGs and enhancing seat capacity on the aforementioned two regional lines, the new DMGs will also run on newly established connections to near and larger towns in Croatia.

To improve the existing offer in passenger transport and add other offers, and to reduce costs arising from leasing locomotives from SŽ–Tovorni promet d.o.o. and the use of classic trains in internal transport, the purchase of several system one-level EMGs with direct and alternating rated voltage of 3 kV and 15 kV, which would connect Gorenjska, Ljubljana, Zasavje, Posavje and Štajerska, thus enhancing the offer in long-distance transport (for long-distance passengers), especially on the Ljubljana–Celje–Maribor and Ljubljana–Jesenice lines, is reasonable. New rolling stock would facilitate connections with nearby Villach and Graz in Austria, and Trieste and Venice in Italy.

Urban line passenger transport

The analysis of the state of vehicles takes into account only vehicles in the two city municipalities where the organisation of the PUS of urban line passenger transport is mandatory. The company, Javno podjetje Ljubljanski potniški promet d.o.o., carries out transport in the Municipality of Ljubljana, while Javno podjetje za mestni potniški promet MARPROM, d.o.o. does the same in the Municipality of Maribor.

To carry out urban public passenger transport, MARPROM manages a vehicle fleet, which included 45 buses in 2013 (situation as at 1 October 2013). The average age of vehicles intended for the implementation of urban public passenger transport was 11.9 years; 27 buses or 59.9% were older than 15 years, and 2 buses were even older than 19 years.

To carry out urban public passenger transport, Ljubljanski potniški promet managed a vehicle fleet consisting of 208 buses in 2013 (situation as of 1 December 2013). The average age of vehicles intended for the implementation of urban public passenger transport was 10.76 years; 77 buses or 37.9% were older than 15 years, and 27 buses or 12.9% were older than 20 years.

The vehicle fleet in both towns is rather worn out, and the number of kilometres travelled by most vehicles is higher than anticipated in the vehicles' operating periods. The calculation of a vehicle's operating period takes into account that the vehicle will travel between 700,000 and 800,000 kilometres. In Maribor, only 14 vehicle or 31% had travelled less than 700,000 kilometres, while the remaining 31 vehicles or approximately 69% had travelled more than 700,000, of which 20 vehicles had travelled more than 1 million kilometres. The situation in Ljubljana is similar, if we take into account the fact that an urban bus in Ljubljana travels an average 60,000 kilometres per year.

The vehicle fleet in Maribor is also problematic from the environmental aspect, as 35 buses or 77.7% are environmentally unsuitable (32 vehicles with EURO 2 engines and 3 vehicles with EURO 3 engines), while only 10 buses are environmentally suitable (8 buses with EURO 5 engines and 2 buses with EURO 5 EEV engines).

As at 31 December 2013, only 50 buses in Ljubljana met the EURO 5 standard and 20 buses met the EEV standard. The most problematic are 27 buses which do not even meet EURO 1; also, 68 buses barely meet EURO 2.

The existing vehicle fleet is also less passenger-friendly from the aspect of comfort, since 20 vehicles or 44% of the fleet do not have air conditioning. Only 10 vehicles or approximately 22% of the entire vehicle fleet meet all the criteria for transporting disabled persons.

In relation to the passenger-friendliness of buses, the situation in Ljubljana is slightly better, since old buses were also subsequently fitted with air-conditioning devices and ramps for physically disabled persons. Some 182 buses in Ljubljana are low-floor buses, of which 181 have air-conditioning.

Urban public passenger transport in Maribor does not provide a sufficient and qualitative alternative to transport with private vehicles as per:

- the number of available vehicles;
- age structure of vehicles;
- construction characteristics (not all buses have low floors and so are not accessible for all population groups);
- the majority of vehicles have more mileage than anticipated for their operating periods.

The town needs new, comfortable, powerful, and environmentally and user-friendly vehicles, especially low-floor and low-emission vehicles.

Figure 73.
Number of vehicles used by MARPROM to carry out urban public passenger transport

Within the programme of long-term strategic modernisation of the vehicle fleet, MARPROM intends to modernise 10% of its vehicle fleet annually between 2020 and 2030, which means that the age of 5 years of vehicles would be achieved in 5 years of operations. At the same time, more vehicles would also raise the quality of urban public passenger transport, especially the frequency of service on urban passenger lines.

A similar conclusion may be drawn for Ljubljanski potniški promet. Fleet renovation is especially necessary due to its environmental unsuitability. Replacing all buses that do not meet at least EURO 4 and 5 standards would lower PM10 emissions by over 20 tonnes annually. It is planned in Ljubljana to increase the vehicle fleet by at least 300 vehicles by 2030. By 2020, the municipality wishes to eliminate all buses from the vehicle fleet that do not meet the EURO 4 and 5 standards. It is planned to reduce the average age of vehicles in the vehicle fleet to 8 years by 2020 in Ljubljana. Later, replacements (10% of the vehicle fleet annually) and additional purchases to increase the vehicle fleet are also planned.

4.4.3.3.3 Conclusion

Public passenger transport in Slovenia is carried out by buses and trains. Bus transport operates at the international, national and urban levels, while most trains operate at the international and national levels. Only about 8% of journeys in Slovenia are made by public passenger transport. One reason for the relatively low utilisation of public passenger transport is the relatively poor and uncompetitive level of the service.

The main shortcomings of public passenger transport are:

- the system does not have an operator to manage the system comprehensively from the aspect of passengers' needs, the optimal organisation of transport and financial flows in public passenger transport;
- mutually uncoordinated timetables;
- no single ticket for the use of various transport modes of various operators;
- travel time is uncompetitive compared to private vehicles;
- services, especially rail services, are not frequent enough and not arranged according to the principle of a clock-face timetable;
- several transfer points, stations and stops do not provide safe and comfortable havens, sufficient information, comfortable and safe access and transfer, including Ljubljana bus and train stations;
- outdated vehicle fleet;
- disorderly PPT stations and stops;
- the P+R system has not been widely established;
- unsuitable PPT arrangement – rigid and not adjusted to the changed needs of various areas.

Figure 74.
Access to Ljubljana by public transport, 2011.

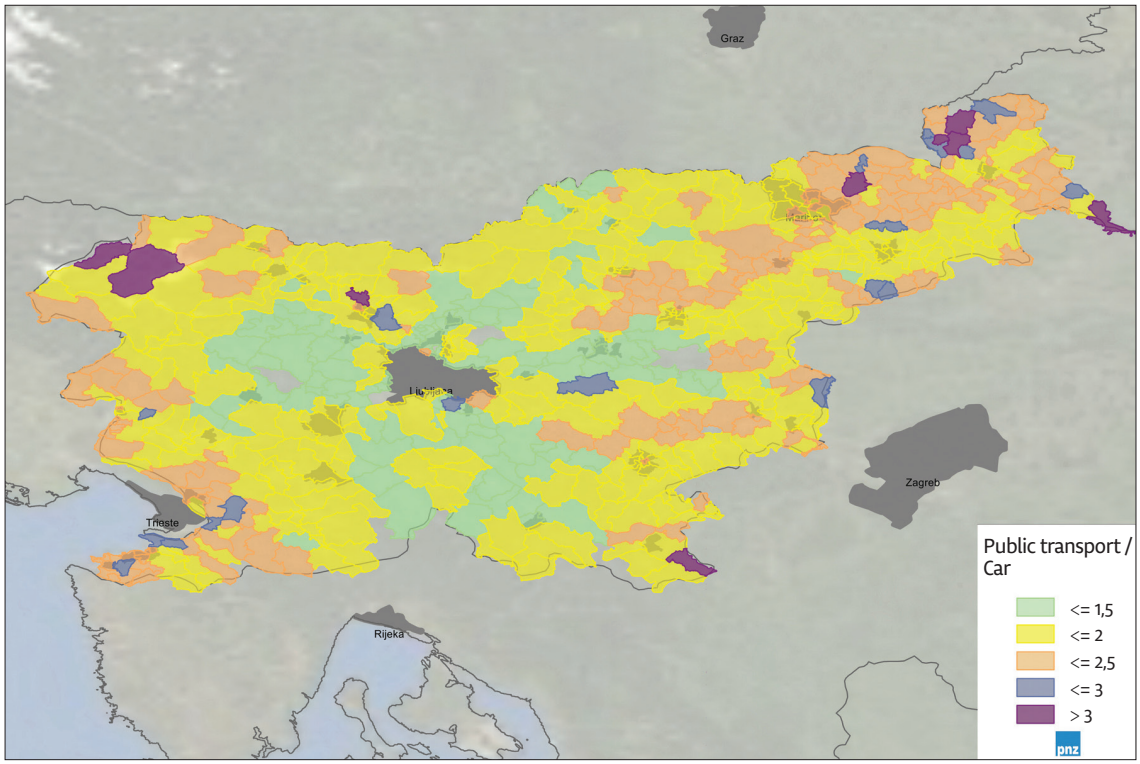


Figure 74 shows that Ljubljana is best accessible by public transport from areas with railway lines and concentrations of bus lines (highlighted green).

Desired state:

- Public passenger transport must be organised in accordance with the Sustainable Mobility Strategy.
- Public passenger transport should be competitive in order to reduce the need for, and dependency on, private vehicles.
- People without vehicles must be able to meet their travel needs (work, school, stores, culture etc.) by public passenger transport in a comfortable manner and within an acceptable period, and at acceptable costs.
- The Spatial Development Strategy of Slovenia provides the following guidelines:
  - (1) Public passenger transport at the national and local levels is being developed into a logistically integrated system. The entire PPT system is being developed as a combination of air, rail, road and maritime transport which emphasises public passenger rail transport in the direction of transport Corridors V and X.
  - (2) A system of passenger terminals is being developed, and stops for various PPT systems are being logistically connected to achieve the speedier development of PPT and high-quality transport services. In accordance with the development of settlements, regional centres are being developed into PPT transport hubs.
  - (3) Speedier PPT development improves access to centres of regional importance by public transport modes. PPT systems in urban areas must be efficiently connected into a PPT system of regional, national and international importance; therefore, settlements in four wider urban areas (note: the Spatial Development Strategy of Slovenia specifies five wider urban areas: Ljubljana, Maribor, Celje, Coast and Nova Gorica) are connected in a suburban rail transport system.
  - (4) In co-dependency with the development of settlements, all forms of PPT are being preferentially developed into a so-called 'train–bus' transport system in connection with car parks and cycling routes in order to facilitate the 'park and ride' system. The development of public maritime PPT is being accelerated in the coastal area. Along with the improvement of integrated PPT, the development of non-motorised transport, such as cycling and walking, is being promoted in narrower urban and local areas.

Actual state:

- Due to the motorisation process and gradual reduction in the use of public transport, its offer gradually declined to the point where public transport ceased to be attractive or competitive with private vehicles.
- Since public passenger transport is not competitive with private vehicles, the number of public transport (bus and train) passengers has declined more than threefold in the last decade and public transport options have halved.
- Despite relatively good spatial coverage, the level of public passenger transport services is relatively poor and unattractive, especially due to unfavourable timetables, lengthy travel times and high costs, particularly of buses. In addition, transfers, stations and stops are poorly organised.

Finding:

- Public transport is not currently competitive with private vehicles, and its competitiveness is continuing to decline.
- Current public transport does not facilitate comfortable or time- and cost-efficient transport.

Required measures:

Public passenger transport will have to be modernised and organised so that the advantages of rail are optimally utilised, making railways the primary carrier, and so that bus transport ensures suitable options in other areas. Therefore, the following measures must be realised:

- organise the existing public passenger transport so that rail, which has comparable advantages, becomes the primary carrier; reorganise bus lines in rail corridors for them to supply passengers, while other buses continue to operate as independent lines;

- harmonise timetables and introduce a uniform ticket;
- introduce a clock-face rail timetable with acceptable frequency;
- implement sustainable mobility measures at the national and local levels by promoting pedestrian, bicycle and public passenger transport, and ensure conditions for P+R;
- introduce separate lanes for public passenger transport or yellow lanes in all larger towns;
- fit all transfer points, stations and stops with overhanging roofs; arrange platforms for people to comfortably board and alight from vehicles; arrange safe and comfortable access; introduce advanced information systems; construct Ljubljana bus and train stations;
- upgrade the vehicle fleet by taking into account environmental requirements;
- adjust the PPT system by introducing transfers at request to various areas where establishing regular lines would not be rational (remote, thinly populated areas, tourist areas, etc.);
- encourage municipalities to plan activity development from the aspect of PPT and sustainable mobility.

These measures will make public passenger transport more attractive and competitive, and enable a suitable level of service.

4.4.3.4 Bicycle traffic

Bicycle traffic is classified among the most suitable transport modes in terms of the environment and health. It is also the quickest transport mode for short distances (up to three kilometres). At the national level, the system of cycling routes may facilitate transfers to work, school, shops, etc. over short distances, and recreation and tourism development over long distances.

Primary national cycling routes must be arranged as special routes intended only for cyclists and separated from motorised transport. Secondary cycling routes must be separated with a black line along the right edge of the carriageway intended for motorised transport. On roads with less volume and lower travel speeds, bicycle traffic may also run along a mixed carriageway. These are tertiary cycling routes.

Distances, topographic and weather conditions, and especially the arrangement of cycling routes and their connection in a complete system affect the quantity of bicycle traffic. The disorganisation and disconnection of these routes is also a principal obstacle to the development of this type of transport.

Approximately 55.21 kilometres of national cycling routes have been constructed in Slovenia, and 21.77 kilometres of routes are being constructed. Cycling routes also spontaneously follow surfaces with mixed traffic. However, in some places, the problem is the unadjusted speed of motorised transport.

Considering its purpose or function in transport, cycling connections throughout the entire cycling network in the Republic of Slovenia may be divided into two basic groups:

1. **cycling connections which facilitate sustainable mobility and intermodality:** at the local level, the public passenger transport network and cycling connections interconnect peripheral settlements and with towns, and promote the intermodality of the transport system. In co-dependency with the development of settlements, cycling is integrated into all forms of public passenger transport in the so-called 'train–bus' transport system in connection with car parks and cycling routes in order to facilitate the 'park and ride' system. Public passenger transport which gives priority to cyclists and pedestrians is particularly being supported and expanded, while car transport is being reduced and terminated on the fringes of central areas with organised parking. In towns and other settlements, a cycling network is also being constructed for daily commuting

over short distances. The most important directions of private transport in urban areas should be fitted with cycling paths and lanes, which should then be connected with public passenger transport stops and parking areas for motor vehicles;

2. **national cycling network:** in accordance with the Spatial Development Strategy of Slovenia, he development of a network of cycling paths is planned in connection with an ecologically oriented tourist offer, which will also enable the population to take healthy physical exercise. The design of the national cycling network includes a network of national long-distance and main cycling connections which connect urban centres and tourist settlements, and are connected to the European long-distance cycle routes nos. 8 and 9, which run through Slovenia.

Networks of regional cycling connections are being developed towards long-distance and main connections, and connected to European cycle routes.

The basic principles are as follows:

- short-distance transport in towns and suburbs, instead of using cars for distances shorter than 10 km where limitations and high parking costs are expected, i.e. bicycle traffic as part of public transport;
- local trips in and around numerous smaller settlements in Slovenia, where topographic conditions permit;
- short trips to railway or bus stations, where the combination with public passenger and rail transport is expected to become important in daily commuting from suburban and peri-urban areas ('bike and ride');
- recreational and tourist cycling in the surroundings and hinterland of larger settlements and in areas attractive to tourists (spas, wine roads, picturesque castles, villages), holiday and travel related cycling or one-day rides with a return to the starting point;
- international tourist-oriented cycling and the connection of the national cycling network with the network of the European Cycle Routes.

Desired state:

- Slovenia should have an arranged system of national cycling routes with the pertaining equipment.
- Cycling routes must be categorised into primary, secondary and tertiary routes with suitable arrangements.
- The speed of motor vehicles in mixed traffic areas should be limited to a maximum of 50 km/h, and 30 km/h in narrow and densely built-up areas.
- The Spatial Development Strategy of Slovenia determines
  - (1) The design of the cycling network includes a network of national long-distance and main cycling connections which connect urban centres and tourist settlements, and are connected to the European long-distance cycle routes nos. 8 and 9, which run through Slovenia.
  - (2) Considering spatial options and available road infrastructure, the existing routes free of motorised transport or less burdened traffic routes should be used for cycling routes. New cycling routes should be arranged in areas without such options
  - (3) Networks of regional cycling connections are being developed towards long-distance and main road connections, and connected to the European cycle routes. In towns and other settlements, a cycling network is also being constructed for daily commuting over short distances. The most important directions of private transport in urban areas should be fitted with cycling routes and lanes, which should then be connected with PPT stops and parking areas for motor vehicles.

Actual state:

- Slovenia does not have a document categorising national cycling routes, or determining where and how they should be arranged.
- Table 3.29 shows that over 1,000 road accidents annually in Slovenia involve cyclists.

Table 3.29: Number and consequences of road accidents involving cyclists

Year	No. of road accidents	Consequences (injuries)			Injuries (G+M)
		Fatalities	Serious injury	Minor injury	
2009	1,202	18	175	909	1,084
2010	1,081	16	125	834	959
2011	1,314	14	147	965	1,112
2012	1,381	12	198	991	1,189
2013*	1,279	16	152	985	1,137
Comparison 13*/09	**6%**	**-11%**	**-13%**	**8%**	**5%**
Comparison 13*/12	**-7%**	**33%**	**-23%**	**-1%**	**-4%**

* Temporary data.

Finding:

- No document regulates national cycling routes.
- The system of national cycling routes has not been completed, due to which cycle traffic cannot develop properly.
- Cycling on roads where the same surface is used by cyclists and motorised transport is dangerous and unattractive.

Proposed measures:

Bicycle traffic must be suitably developed. Therefore:

- a strategic plan to arrange cycling connections at the levels of the state, functional regions and towns should be prepared and implemented;
- traffic calming measures should be carried out on roads for mixed traffic in order to make cycling safer, especially in narrow, densely built-up and dangerous areas;
- a regulation on the categorisation of cycling connections and a regulation on the design of cycling surfaces should be prepared;
- spatial and transport planning at the national, regional and local levels should be harmonised according to existing needs to support future development.

The priorities in developing the cycling network in the Republic of Slovenia are:

1. cycling connections which facilitate sustainable mobility and intermodality:
   - improve urban and suburban cycling connections with public bus and train transport, and influence the change in mode choice in favour of cycling in towns and suburban areas; establish the park and ride system by constructing car parks on the edges of settlements and enhancing public passenger transport, including the use of public bicycles, etc.;
   - ensure suitable traffic safety for cyclists;
   - reduce negative impacts on the environment;

2. national cycling network:
   - provide a connection with the international cycling network;
   - ensure state connections also through cycling connections;
   - ensure suitable traffic safety for cyclists;
   - take into account a market-oriented approach and the significance of tourism

4.4.3.5 Port of Koper

The Port of Koper is among the most important north Adriatic ports, and has the status of an entry point for goods destined for the EU. In addition to Slovenia, the port also supplies Austria, Italy, Hungary, the Czech Republic, Slovakia, Bavaria, Poland and countries of the former Yugoslavia. The volume of transhipment at the port is constantly increasing. In 2012, 17.9 million tonnes were transhipped (or 5% more than in 2011), i.e. 571,000 TEU of container transport and 480,000 cars.

In 2012, the Port of Koper focused on maintaining its position in traditional markets, and also utilised new opportunities and increased its share in other markets. In the transhipment structure, the highest shares in 2012 were taken by the domestic market (29%), the Austrian market (27%) and the Italian market (14%). The port's objective is to achieve transport growth of over 19 million tonnes by 2015 and over 23.5 million tonnes by 2020. In 2030, over 30 million tonnes of transhipment is expected.[45]

45: Report on the scope of transhipment and development of the Port of Koper, Luka Koper, 2013.

Due to the falling prices of shipping, ships are becoming larger, but the port has not yet adjusted to this: the problems are entry canals and pools which are too shallow, and short piers.

Increasing transhipment requires the prompt provision of suitable additional port infrastructure and better capacity of hinterland connections, especially rail, which is a bottleneck and a threat to the development of the port. The Koper–Divača and Divača–Ljubljana lines, the Ljubljana hub, and the Ljubljana–Jesenice and Zidani Most–Šentilj/Hodoš lines pose the most problems.

Figure 75.
Port development by 2020 (medium term)

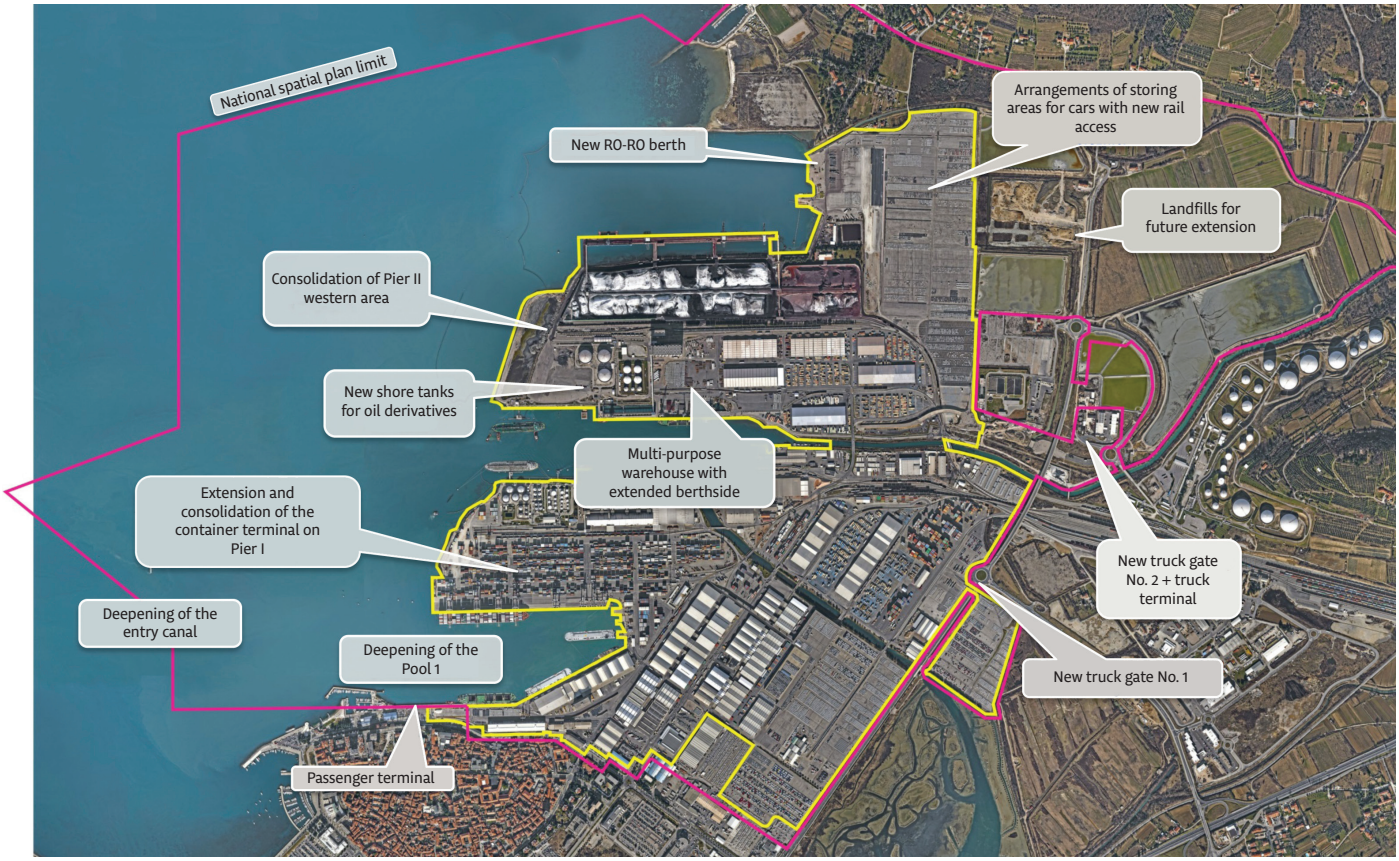


Figure 76.
Main projects at the Port of Koper within the framework of NSP

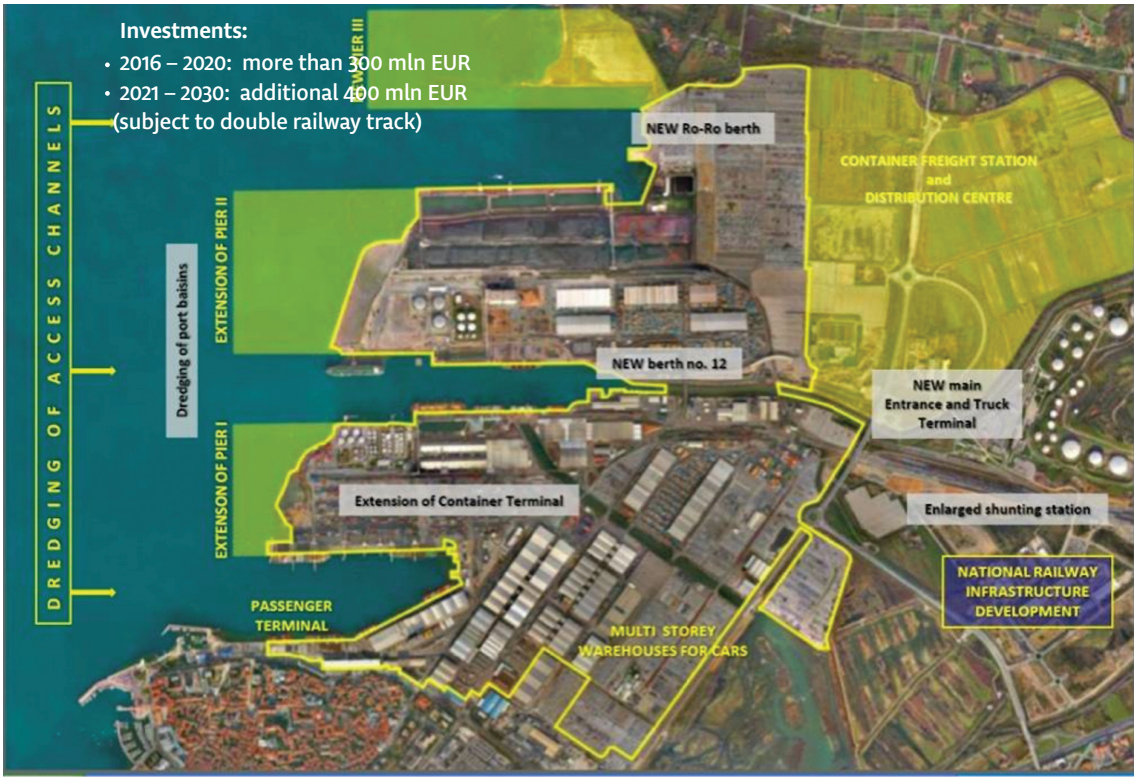


Figure 76 shows the length of piers and other required arrangements to facilitate the port's further development.

Desired state:

- uninterrupted entry of large ships directly into the Port of Koper;
- sufficient capacity of port infrastructure;
- sufficient capacity and quality of hinterland railway connections;
- the Spatial Development Strategy of Slovenia states that the port should be developed as a priority, and in connection with other north Adriatic ports and the hinterland or European transport Corridors V and X. To improve transport connections between towns in Slovenian Istria and other places in the northern Adriatic region, intercontinental maritime passenger transport should be planned, and maritime passenger transport should be promoted in Koper.

Actual state:

- currently, larger ships cannot dock at the Port of Koper;
- existing port infrastructure does not facilitate the reception of large volumes of cargo;
- the current capacity and quality of rail connections do not facilitate the port's further development.

Finding:

- unsuitable dimensions of entry canals, pools and piers, unsuitable existing port infrastructure, and the bottlenecks on the Slovenian railway network (poor hinterland connections) threaten and hinder the development of the Port of Koper.

Proposed measures:

The development of the Port of Koper will be facilitated through the following urgent measures:

- deepening of other entry canals and pools (in addition to those currently being deepened), extension and construction of piers, and rearrangement of other port infrastructure;
- rearrangement of the railway network to facilitate the reception of expected cargos and delivery within an acceptable period;
- arrangement of a suitable road connection between the motorway network (expressway) and the entrance to the port, and arrangement of the road network in the Koper area.

Measures to facilitate an increase in transhipment from 18 million to 35–40 million tonnes are divided into three phases:

1. Phase 1 – by 2015: anticipated deepening of the entry canal into Pool 1 and deepening of Pool 1 for the container terminal. In August 2014, deepening from the current 11.5 m to 14 m was carried out, and further deepening by 1 m to 15 m depth is anticipated by the end of 2015. The deepening will also facilitate the entry of large ships with a capacity of 8,500 TEU (currently, only the entry of ships with the load-bearing capacity up to 6,500 TEU is possible).
2. Phase 2 – by 2020 (medium term): investments will include existing infrastructure. An important activity by 2020 is the deepening of the entry canal into Pool II, the extension of Pier I, and the acquisition of containers in the rear area.
3. Phase 3 – after 2020 (long term): two major investment projects will be carried out: the extension of Pier II and the construction of Pier III.

Table 3.30: Medium-term terminal priorities

Capacity	By 2015	By 2020
Containers	Extension of rear areas (dilatations)	Expansion of the terminal into the rear area
	Enhancement of track capacity	
	Arrangement of access and exit points to the terminal	
General cargo	Warehouse of conditioned goods, overhanging roofs	Warehouse for iron products
		Relocation of overhanging roofs for wood from the rear area of Pier I
Coal and iron ore	Reinforcement of the existing landfill	Carriage loading station with pertaining equipment
	Commencement of the project of a new carriage	
	Expansion of the iron ore landfill	
Liquid cargo	Reconstruction of reservoirs on Pier II for flammable liquids	
	Construction of a new reservoir on Pier II	
	Jet reservoirs	
Bulk cargo	Overhanging roofs	Soya bean warehouse on Pier II
	Ecological restoration	
Cars	Arrangement of additional surfaces	Multi-storey car park
Passengers	Basic arrangement of the terminal	Terminal facility

Source: Report of Luka Koper d. d., January 2014.2014.

Table 3.31: Port infrastructure intended for public transport

Capacity	By 2015	By 2020
Shore, piers, pools	Extension of Pier I on the southern side	Extension of shore on the northern side of Pier I
	12th berth	Deepening of Pool III
	RO-RO berths in Pool III	Extension of shore of Pier II
	Berth 8c for cattle	Commencement of arrangement of Pier III
	13th berth – shore for a silo	Deepening of Pool II
	Deepening of pools and maintenance of depths	
Other – inside the port	Additional tracks	New entrance and truck terminal
	Expansion of the existing entrance to the port	Southern artery on the eastern side which connects the main entrance to Pier I
Other – outside the port	Acquisition/arrangement of containers 6A, 7A and 799/29	New entrance and truck terminal
	Deepening of the entry canal into Pool I	Deepening of the entry canal into Pool II
Capacity	**2014–2020**	
Pier I	Extension of Pier I	
	Container at the beginning of Pier I	
	Railway track on Pier I	
Pier II	Construction of the 12th berth and related deepening	
	Construction of berth 8c and related deepening	
	Extension and reconstruction of the silo shore (13th berth)	
	Closure and construction of a container at the beginning of Pier II	
	Extension of shore of Pier II	
	Construction of a berth at the beginning of Pier II	
	Railway tracks and other track infrastructure on Pier II	
	Deepening of Pool II	
Pier III	Arrangement of temporary berths in a multi-purpose area	
	Commencement of construction of Pier III – 27th and 28th berth for RO-RO and deepening	
Rear areas	Arrangement of containers 6A and other new surfaces (799/29 and 7A already in 2013)/habitats	
Connecting infrastructure	New entrance, truck terminal, primary port infrastructure, viaduct, relocation of the artery	
	Railway connection	

Source: Report of Luka Koper d. d., January 2014, and data of the Infrastructure Directorate at the Ministry of Infrastructure.

4.4.3.6 Inland waterways of the Republic of Slovenia

Navigation on inland waterways has not receive much attention in Slovenia in the past; however, there are some opportunities for such transport on Slovenian rivers and lakes. Municipalities are responsible for arranging river transport in Slovenia. Several problems occur in this respect, which demand that this field be arranged at the national level, particularly regarding the categorisation of navigation on rivers and lakes, conditions for such navigation and its safety.

Within Slovenia's membership in the European Union and participation in the International Sava River Basin Commission, we strive to connect in the long term some 20 kilometres of Slovenian inland waterway on the Sava between Brežice and Obrežje with the existing Sava waterway at Sisak.

By constructing a chain of hydroelectric power plants on the Lower Sava between Krško and Obrežje in Slovenia and its continuation on the Croatian section of the Sava between Obrežje and Sisak, a new inland waterway will be established, which will be able to meet at least the conditions for international waterway classification IV, enabling Slovenia to take part in international inland

waterway transport and the TEN-T Danube transport routes. The shortest missing link of the intermodal international transport between the Mediterranean–Adriatic motorways of the sea on TEN-T Corridors V and X and the Sava–Danube inland waterways would thus be complete, which would have beneficial transport and environmental effects.

In pre-accession negotiations for Croatia's accession to the EU, Slovenia made a unilateral statement in Chapter 21 Trans-European Networks, in which it emphasised that it was in its strategic interest and also in the interest of the EU to determine suitable classification of the international inland waterway on the Sava also on the section between Sisak and Brežice in one of the next reviews of the TEN-T network. In this aspect, Slovenia highlighted that its consent to the temporary closing of Chapter 21 did not prejudice its position in negotiations on the future review of the TEN-T network.

Several beneficial effects will be attained by realising the strategic decision on extending the waterway from Sisak to Brežice. The existing multimodal road and rail TEN-T Corridor X will thus be supplemented with an international inland waterway on a significantly longer section of the Sava than at present, which will increase its attractiveness for combined transport. The shortest missing link of waterways for intermodal international transport between the Mediterranean–Adriatic motorways of the sea on TEN-T corridors V and X and the Sava–Danube inland waterways will be established.

By transferring heavy goods to the inland waterway already on the Slovenian section of the Sava, the strategic EU guidelines regarding the reduction of greenhouse gas emissions and unburdening of road and rail corridors of heavy goods will be adhered to more closely. A longer inland waterway on TEN-T Corridor X may contribute to more economical transport on this multimodal transport corridor in the long term.

Croatia is already planning to extend the international waterway of classification IV on the Sava or the flood control channel of the Sava–Odra–Sava to Zagreb, but not to Slovenia, to which only classification II would be established, although the newly constructed pools of hydroelectric power plants and flood embankments would enable the establishment of classification IV on the Sava River, with a reasonably low increase in investment costs due to the construction of locks.

The legal bases for establishing international navigation on the Sava in Slovenia include the conclusion of a suitable intergovernmental agreement between Slovenia and Croatia on international navigation on the Sava between Brežice in Slovenia and Sisak in Croatia, and suitable amending of Article 1 of the Protocol on the navigation regime to the Framework Agreement on the Sava River Basin and the incorporation of the already adopted regulations of the Sava Commission on navigation and waterways into the Slovenian legal order.

To establish technical conditions for a waterway on the Sava, European funds could be drawn; however, these may be used only for setting up conditions for international waterways. In spite of the currently unsuitable natural features of the Sava for international navigation between Brežice and Sisak, a waterway of classification IV must be planned, which would be enabled gradually with the construction of the chain of hydroelectric power plants between Krško and Sisak.

Through cooperation in the appropriate European cross-border project, Slovenia and Croatia could construct a harmonised chain of hydroelectric power plants and at the same time establish international navigability of the Sava River to Slovenia. For this purpose, Slovenia was to submit a request for a special comprehensive project prepared already during drafting of the Danube Strategy as a cross-border Krško–Zagreb pilot project.

The Krško–Zagreb project includes a comprehensive approach to the arrangement of the Sava for the needs of energy, navigation, flood protection, irrigation and tourism, while observing sustainable principles of environment protection and preservation of biotic features by introducing substitute natural habitats when this is necessary. Both countries could draw resources for the implementation of this project with joint candidature at tenders of financial funds of the European cohesion and regional policies.

The navigation on inland waterways in Slovenia also takes place as per regional classifications (I–III); however, this field has not been arranged accordingly yet. For this reason, navigational categories of inland waterways on Slovenian rivers and lakes (artificial lakes) will have to be determined first, and suitable conditions will have to be determined for them.

The purpose of classifying waterways on inland waters is to enable and permit navigation under the same conditions suitable for each individual classification. As per the Inland Waterways Navigation Act (ZPCV), navigational regimes in navigational areas are currently managed by local communities, which may be a difficult barrier to overcome for users regarding the integration of navigational regimes on water bodies exceeding the area of only one local community.

Legislation in this field would have to be harmonised in order to suitably arrange the navigational regime, including the Waters Act, which stipulates that navigation of vessels denotes general use of water, but then simultaneously prohibits the navigation of powered vessels in general.

Uniform navigational regimes on Slovenian water bodies will be prescribed with the categorisation of navigable waterways, which will facilitate the management of navigational areas and improve supervision efficiency.

The use of powered vessels outside the categorised navigable waterways would not be permitted or would be permitted only exceptionally under strict conditions determined for public passenger transport and organised sightseeing tours.

By establishing an international waterway on the Sava, Slovenia will be linked to the entire European network of inland waterways (TEN IWW) through the Sava and the Danube rivers, and will thus be obliged to include the entire European legislation on inland waterway transport, including the safety of such navigation and regulations of the Sava Commission on the navigation on the Sava River, in its legal order as an EU Member State and signatory to the Framework Agreement on the Sava River Basin. The safety of navigation on inland waterways regarding international and regional classifications will also be arranged accordingly.

4.4.3.7 Airports

Ljubljana Jože Pučnik Airport

Ljubljana Jože Pučnik Airport is the central Slovenian airport; the number of passengers transported stagnated in recent years, but began to rise in 2013. Growth is also expected in the long term, particularly due to its favourable geostrategic location.

In 2013, 1.3 million passengers were transported, and 2.3 million passengers are expected to be transported in 2030. Also expected is a change in the transport structure, i.e. growth of the share of foreign and low-cost carriers. Cargo transport is also expected to grow; in 2013, 17,800 tonnes were transported, and 27,800 tonnes are expected to be transported in 2030.[46]

46: Contribution to the Resolution on the National Programme for the Development of Transport Infrastructure in the Republic of Slovenia, Aeroinženiring, January 2014.

Desired state:

- The uninterrupted operation of the airport at present and in future requires more space for passengers and cargo, the construction of manoeuvring areas, an apron, an access system and parking areas, the relocation of the main road, and enhancement of sustainable access to/from the airport from centres of national importance, etc. The expansion of activity also requires the construction of the Aeropolis business and logistics centre, etc.
- The Spatial Development Strategy of Slovenia determines that the design of international airports/heliports for the needs of international air transport at the national level be preserved and that the current three public airports/heliports for international air transport be developed.

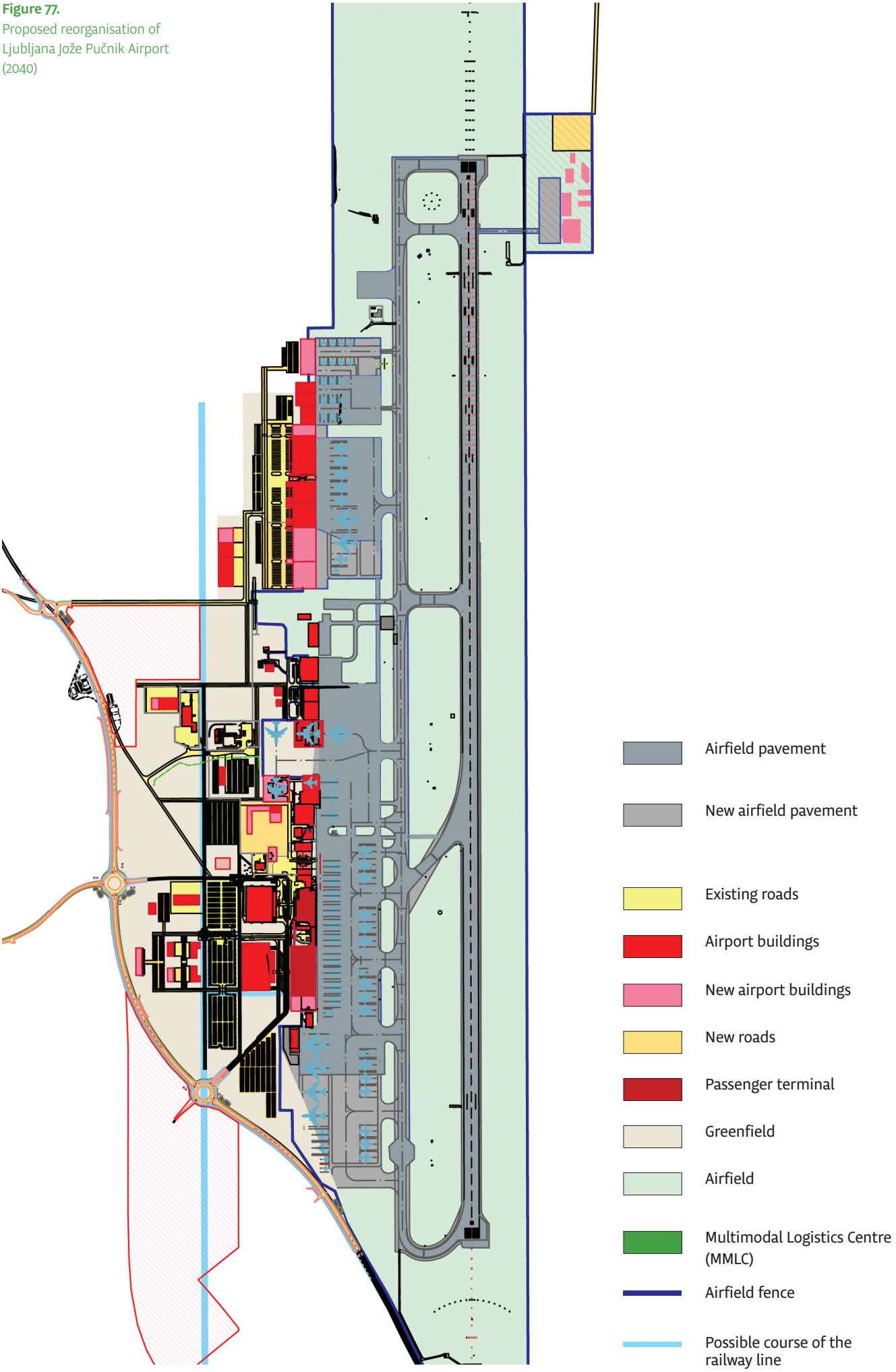
Actual state:

- The area for handling passengers and cargo is already too small and a bottleneck during peak hours. Hangar capacity and, partly, manoeuvring areas also present a problem. Other measures are not currently urgent, but will be necessary for the development of the airport.

Finding:

- The greatest problem is the airport's bottleneck, i.e. in terms of the capacity of the unsuitable passenger and cargo terminals. Other problems will occur if the development of air transport is intensive. Therefore, we would like to improve the service.

Figure 77.
Proposed reorganisation of Ljubljana Jože Pučnik Airport (2040)



Proposed measures:

- new passenger and cargo terminals, increase in hangar capacity and other urgent arrangements (a more detailed description is given below);
- better PPT connections with centres.

Projects between 2014 and 2020:

- new passenger terminal: the new terminal will be connected with the existing terminal on the first floor, since part of the existing terminal will still serve transport needs, i.e. as a waiting area for passengers in international transport. The capacity of the new terminal will be 1,800 passengers incoming and outgoing per hour. The new terminal will ensure 'C' level services according to IATA standards. Thus the conditions for attaining the strategic objectives of the airport and further growth in passenger air transport will be realised.
- relocation of the main road: on the one hand, the relocation of the road will facilitate the arrangement of access and stationary traffic in front of the passenger terminal, as well as separate access to the cargo terminal, while on the other, it will facilitate the development of facilities within the Aeropolis business and logistics centre.
- new cargo terminal: the new cargo terminal will encompass 9,945 m2 of warehousing, and 3,500 m2 of office and accompanying areas. A 9-metre-wide overhanging roof will be constructed in the direction of the apron, while a three-storey business building is anticipated on the northern side of the facility. Warehouses will be at a height of 1.1 m above the height of the access for goods vehicles, and at the height of the platform for aircraft servicing on the air side. Access to the area is anticipated from the northern side through the eastern roundabout on the relocated G2–104 Kranj–Brnik main road. Some 174 parking spaces for the private vehicles of employees and visitors are anticipated on the platform in front of the terminal. The platform for goods vehicles facilitates the manipulation of trucks and access to 22 doors with lift tables. The anticipated capacity of the warehouse is 40,000 tonnes/year.
- energy (reconstruction of facilities, alternative sources).
- business and logistics area, which is divided into three sections, i.e. hotel and congress centre, business and shopping centre with a business park, and logistics.

Projects between 2021 and 2030:

- reconstruction of the existing passenger terminal,
- expansion of the apron,
- construction of buffer zones,
- construction of a hangar for aircraft maintenance,
- construction of a facility for aircraft servicing,
- rail connection with Ljubljana,
- Aeropolis – construction in phases.

Projects after 2030:

- construction of the runway and other manoeuvring areas,
- expansion of the new passenger terminal,
- second phase of the new cargo terminal,
- expansion of aprons.

Maribor Edvard Rusjan Airport

The Maribor Edvard Rusjan Airport is the second largest airport in Slovenia. It is located on the northern edge of the Drava–Ptuj Plain in the Municipality of Hoče–Slivnica. Located in the immediate vicinity of the airport is the town of Maribor, the second largest town in in the Republic of Slovenia according to population.

In 2013, passenger transport began to grow again, especially on account of special air transport during the summer holidays, when over 13,000 passengers were transported. Transport is also expected to grow in the future

Desired state:

- The uninterrupted operation of the airport at present and in future requires more space for cargo, the construction of manoeuvring areas, an apron, an access system, parking areas, hangars for aircraft maintenance and storage, etc.
- The Spatial Development Strategy of Slovenia determines that the design of international airports/heliports for the needs of international air transport at the national level be preserved and that the current three public airports/heliports for international air transport be developed.

Actual state:

- The area for handling passengers currently corresponds to the expected volume, while the area for handling cargo is a bottleneck. Hangar capacity and, partly, manoeuvring areas also present a problem. Other measures are not currently urgent, but will be necessary for the development of the airport.

Finding:

- The greatest problem is the bottleneck, i.e. the cargo terminal. Other problems will occur if the development of air transport is intensive. Therefore, we would like to improve the service.

The following will take place during the anticipated modernisation:

- preservation of the existing runway and its extension towards the south-east to a length of 3,300 metres by additionally arranging hard shoulders is planned;
- planning of a new cargo apron in the extension of the existing apron towards the north-west, parallel to the runway, with appertaining facilities for aircraft maintenance and storage in hangars;
- planning of a new service apron in the extension of the existing apron towards the south-east, parallel to the runway;
- heliport for air passenger transport and for the needs of various services (police, army, first aid, etc.);
- anticipation of an area for a multimodal logistics centre and accompanying activities or arrangements

Portorož Airport [47]

47: Source: Presentation of Aerodrom Portorož, d.o.o., Sečovlje–Sicciole, September 2013.

V preglednici 3.32 je podano število letalskih operacij in potnikov v obdobju 2006–2013 na letališču Portorož.

Year	2006	2007	2008	2009	2010	2011	2012	2013, half-year
Flights	5,775	6,907	6,912	14,219	10,678	13,958	17,845	11,355
Passengers	13,066	13,999	12,927	17,784	16,446	23,262	22,532	19,467

Source: Aerodrom Portorož, d.o.o.

Table 3.32: Number of flights and passengers in the 2006-2013 period

Further development of the Portorož Airport includes plans to extend the runway with the arrangement of the strip and a buffer zone, arrange manoeuvring areas and aprons, arrange the inclusion of accompanying activities (terminals, hangars, technical facilities, etc.), and relocate the main road. The maximum length of the runway will be 1,500 m. The width of the strip will extend 75 metres laterally to each side of the centre line of the runway and the extension of the centre line along the entire length of the strip.
In addition to the manoeuvring areas, the following arrangements are planned in the area of the airport:

- expansion of the apron and the existing taxiway, construction of a new taxiway;
- construction of a heliport;
- arrangement of an access road to the technical complex and car park;
- construction of a parking area for cars and buses;
- reconstruction and expansion of the passenger terminal;
- reconstruction of existing hangars and construction of new hangars for aircraft storage;
- construction of technical facilities;
- construction of an extension to the transformer station;
- construction of an overhanging roof for equipment;
- modernisation and construction of municipal infrastructure and guardrails;
- installation of security systems; and
- water management arrangements.

Since there must be no facilities or arrangements which are not part of the airport in the area of the strip and the buffer zone at the end of the runway, the following are planned:

- relocation of approx. 890 metres of the G2–111/0239 main road, including all facilities and arrangements required for the uninterrupted functioning of the road;
- relocation of the existing border inspection post; and
- relocation of about 430 metres of the Ribila retaining basin.

4.4.4 Environmental acceptability

4.4.4.1 Greenhouse gas emissions

Greenhouse gas emissions trigger climate change. The atmosphere is gradually warming. The United Nations report of 2007 states that greenhouse emissions (GHG) produced by humans have a key impact on global warming, in particular CO2 produced in the combustion of fossil fuels.

Transport, in particular road and air transport, is among the main sources of these emissions. In contemporary society, mobility must be preserved and developed, as this is one of its key needs, and mobility must be sustainable, i.e. transport must not inflict any irreparable damage on the environment.

Transport in Slovenia produces a considerable amount of greenhouse gas emissions. In 2011, traffic on Slovenian motorways, expressways and state roads produced 13,962 tonnes of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) emissions per day. If the transport arrangement remains the same, greenhouse gas emissions will grow to 18,277 tonnes per day by 2030 despite the expected technological improvements.

Desired state:

- The proposed Slovenian operational programme[48] for reducing greenhouse gas emissions determines that greenhouse gas emissions are expected to be reduced by 15 per cent by 2030 in comparison with 2008.

Actual state:

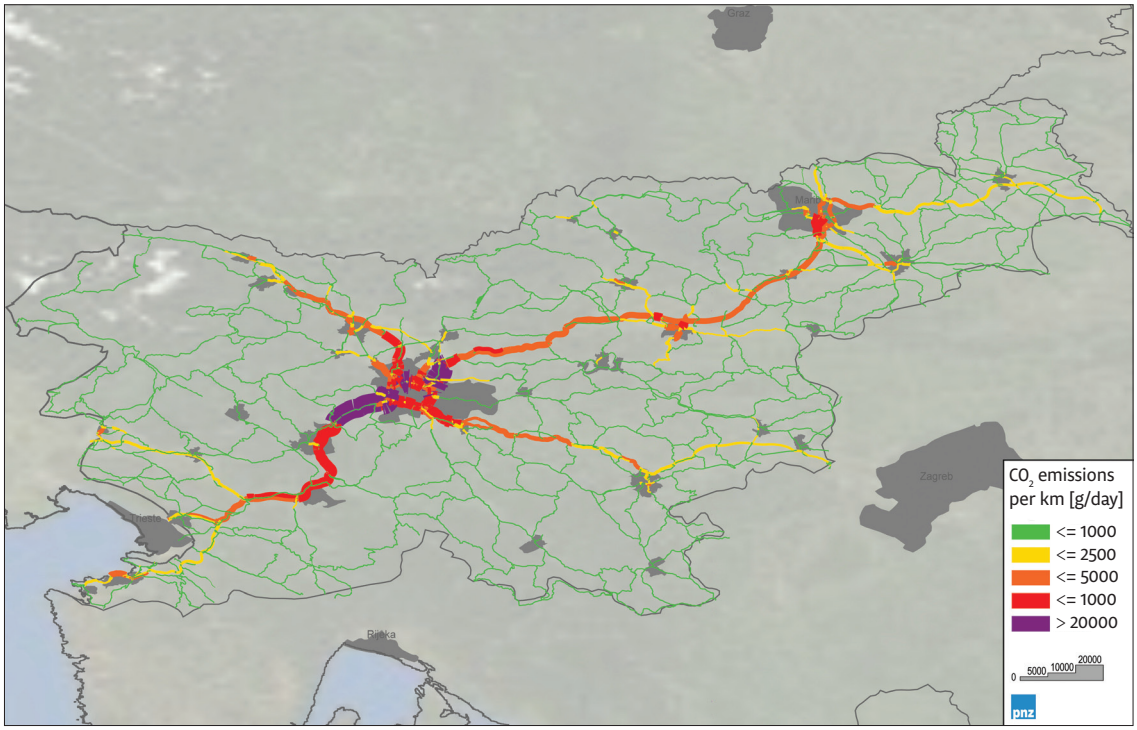
- If the transport arrangement remains the same, greenhouse gas emissions will have grown by 30 per cent by 2030.

48: Operational Programme for Reducing Greenhouse Gas Emissions by 2020 with a vision by 2030, working material, Ministry of Agriculture and the Environment, 2014

Conclusion:

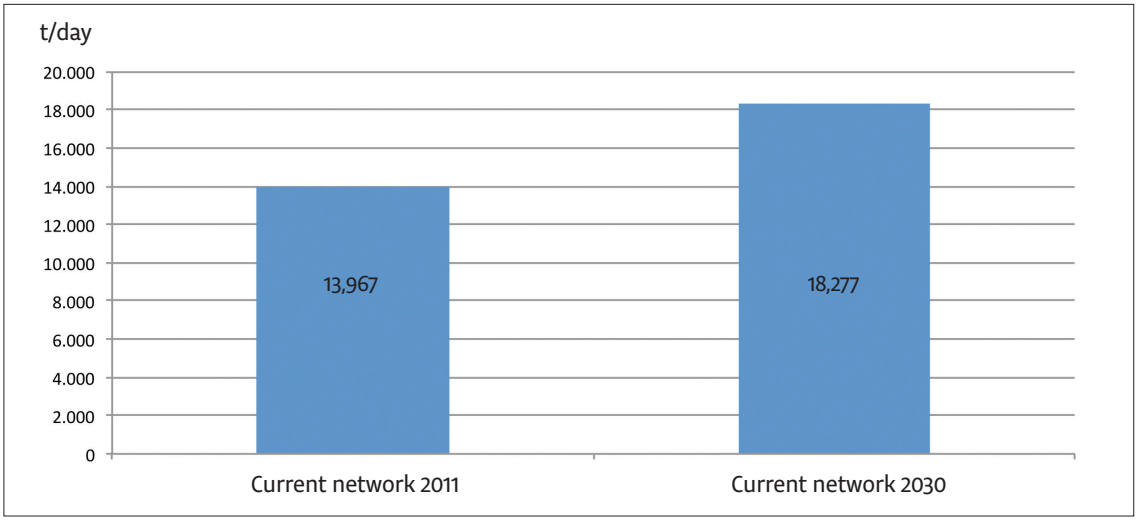
- Spontaneous development orientation will make the conditions regarding greenhouse gas emissions worse and is a move away from the recommendations in the White Paper.

Figure 78.
CO_2 emissions in 2030



Most CO_2 emissions are, and will be, produced along the motorway network, where traffic is, and will be, at its densest.

Figure 79.
Greenhouse gas emissions at the level of Slovenia



Proposed measures:

- introduce an efficient and competitive public, especially rail, passenger transport, with the comprehensive integration of the P+R system at the national level;
- construct a competitive railway network to assume more goods transport;
- promote the use of alternative energy sources, and hybrid and electric vehicles;
- eliminate sections of insufficient traffic throughput.

4.4.4.2 Climate change mitigation

The implementation of measures to attain the objectives of the Strategy must take into account the so-called indicative objectives to reduce greenhouse gas emissions, which are listed for individual sectors in the proposed Operational Programme for Reducing Greenhouse Gas Emissions by 2020, with a vision by 2030. Emissions have been rapidly growing in transport, in Slovenia faster than in other countries included in Annex I to the Kyoto Protocol. In addition, a lot of transit transport which is only partially affected by measures in Slovenia may significantly affect the objectives.

The indicative objectives to reduce greenhouse gas emissions were prepared by individual sectors, taking into account the legally binding objectives for the 2013–2020 period, political solutions adopted at the EU level regarding long-term objectives, the costs of reducing greenhouse gas emissions in Slovenia by 2030, and other general development, sectoral and environmental objectives, and in the formation of a vision, also by taking into account of the effects of the technological solutions which are being developed. The indicative sectoral objectives to reduce greenhouse gas emissions for transport are as follows:

- the rapid growth of greenhouse gas emissions must be halted and reduced by 9 per cent by 2020 in comparison with 2008 through the introduction of sustainable mobility measures;
- the increase of greenhouse gas emissions produced by transport must be reversed so as to prevent their growth by more than 18 per cent by 2030 in comparison with 2005; i.e. a 15 per cent reduction by 2030 in comparison with 2008;
- a vision of further emission reduction by 90 per cent by 2050 must be integrated into measures for attaining the objectives of the Strategy.

4.4.4.3 Climate change adaptation

Great climate diversity is characteristic of Slovenia, since three very different climate types exchange or interact in a very small area: Sub-Mediterranean, Alpine and Continental. Due to great climate diversity, it is expected that the response of individual climatic regions to global warming will be different. Within the "Climate variability in Slovenia" project, the Slovenian Environmental Agency issued the first report on climate change in Slovenia, which presents the expected climate change in Slovenia by 2050. Not all local characteristics of individual regions were included in devising the scenarios, so the assessments on the climate change are only indicative.

The report mainly states that general findings on the climate change in Europe cannot be simply used for Slovenia. The forecast changes of climatic variables included in the report of the Slovenian Environmental Agency refer to:

- temperature, which will increase by 1.0–2.5 °C by 2050 in Slovenia;
- precipitation, for which climate scenarios show far greater uncertainty than for temperature. Annual precipitation is expected to remain more or less unchanged. Reductions and increases in precipitation quantity may be expected in spring and autumn. In winter, an increase in the precipitation is more probable; in summer, a reduction in the precipitation is very probable, at least for the southern part of Slovenia;
- extreme weather events, for which the uncertainty of scenarios of changes is higher than in changes of average temperatures or precipitation. Nevertheless, the following may be expected with high certainty for some extreme weather events:
  - severe heat in summer due to higher air temperature;
  - greater variability of temperature and precipitation in summer;
  - more heavy precipitation events (in general, more water vapour in the atmosphere) and greater evaporation;

- strengthening of the hydrological cycle – water cycle;
- more frequent current centennial floods (shortening of return periods of extreme precipitation);
- very probable significant increase in the frequency of summer drought; and
- probable increase in the number of days with conditions for the emergence of summer storms

Notwithstanding the rather indicative forecasts of climate changes in Slovenia, the findings of similar scenario simulations for other areas in the EU must be taken into account due to a temperature increase of 3.5 or 2 °C. These emphasise that the main challenges of climate change are floods, coastal erosion, higher demand for water, energy and raw materials, and disturbances in transport networks and communication connections caused by extreme weather.

The functioning of transport infrastructure is very sensitive to extreme climatic events. The transport network in Slovenia is particular sensitive to events due to floods, snow on roads and problems in traffic caused by glaze ice. Due to the consistent consideration of the geo-mechanical properties of land in the construction of roads, the transport network in Slovenia is less sensitive to landslides, which usually occur during extreme precipitation events.

The EU Strategy on adaptation to climate change (COM(2013) 216 final) states that the adaptation to climate change has already been included in the EU transport legislation, i.e. in the provisions of Regulation (EU) No 1315/2013 on Union guidelines for the development of the Trans-European transport network. The provisions of Article 5 of this Regulation requires Member States to plan, develop and operate the Trans-European transport network in a resource-efficient way, which means that the sensitivity of transport infrastructure to climate change is properly observed.

Article 41 of Regulation (EU) No 1315/2013 defines in more detail what is deemed an appropriate consideration of the sensitivity of transport infrastructure to climate change. The provisions of this Article require Member States, when planning infrastructure, to take into account the measures from risk assessment and adaptations which suitably enhance resilience to climate change, in particular in relation to precipitation, storms, high temperatures and heat waves, drought, rises in sea level and storm surges.

Pursuant to Article 41, an analysis of the sensitivity of transport infrastructure to climate change must be prepared for all measures planned, and on the basis of its results, measures and adaptations which suitably enhance resilience to climate change must be implemented.
To prepare the analysis of the sensitivity of transport infrastructure to climate change, guidelines and proposals of the most suitable methodologies and procedures for collecting information on extreme weather conditions which put certain transport networks at risk will be drawn up. The findings of the analyses of the sensitivity of a certain part of transport infrastructure to climate change are a basis for planning and implementing the following:

- measures to improve the resilience of road infrastructure to floods;
- measures to improve the resilience of road infrastructure to snow; and
- measures to improve the resilience of the rail network to glaze ice.

4.4.4.4 Atmospheric pollutant emissions

Traffic also produces atmospheric pollutant emissions, which have a wide range of harmful effects on the environment and health: particles (PM_{10}, $PM_{2.5}$), nitrogen oxides (NO_x), sulphur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), etc.

Air pollution is the main environment-related cause of premature death in the EU, as pollution accounts for ten times more deaths than road accidents. According to the OECD data, "urban air

pollution is set to become the primary environmental cause of mortality worldwide by 2050, ahead of polluted water and lack of sanitary services".

A major problem in Slovenia is the excessive concentration of PM_{10} particles and ground-level ozone (O_3) in ambient air. Ground-level ozone (O_3) is produced by photo-chemical reactions between ozone precursors: nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), methane (CH_4) and carbon monoxide (CO). Anthropogenic emissions, especially from transport and industry, contribute most to ozone precursor emissions.

Particles (PM_{10}, $PM_{2.5}$) are classified according to source:

- primary particles (the result of direct emissions of dust into the air, e.g. from vehicle exhaust systems during the combustion of diesel fuel), and
- secondary particles:
  - which are the result of chemical reactions between precursors of secondary particles: nitrogen oxides (NO_x), sulphur dioxide (SO_2), ammonia (NH_3) and non-methane volatile organic compounds (NMVOC);
  - secondary particles are also particles deposited on surfaces and resuspended in the air, e.g. as a consequence of traffic or wind (resuspension of particles).

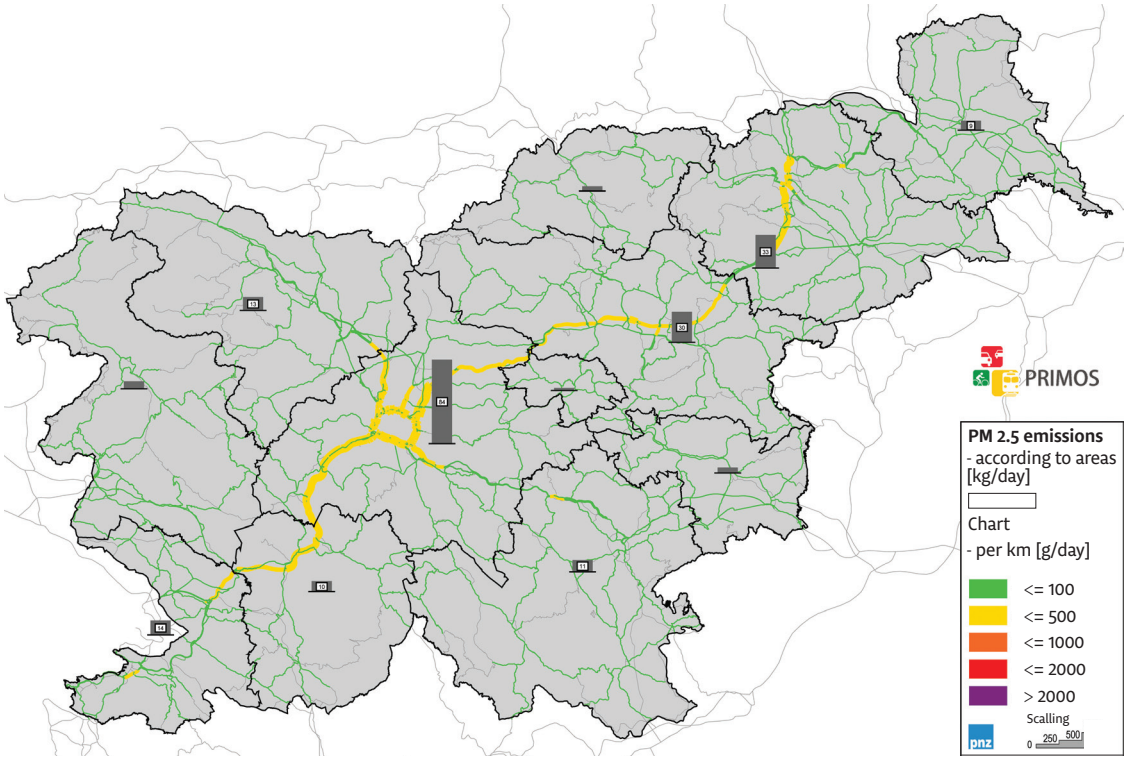
The combustion of diesel fuel is a major source of particles from transport. Most particles from the exhaust of diesel-powered vehicles are categorised as PM2.5 (particles smaller than 2.5 micrometre, which are a subset of PM_{10} particles). Carcinogenic and mutagenic substances (polycyclic aromatic hydrocarbons (PAH)) are also adsorbed on particles from the exhaust of diesel-powered vehicles. Polycyclic aromatic hydrocarbons (PAH) are emitted by being adsorbed on particles or in a gaseous state. Diesel-powered vehicles are also important sources of nitrogen oxides (NO_x) (exhaust is much greater than from vehicles with petrol engines) which are precursors of secondary PM_{10} particles and ground-level ozone (O_3).

Several consecutive generations of EURO and fuel quality standards have been agreed upon to control emissions in the EU. In accordance with the requirements, emissions declined slightly, with one exception, i.e. NO_x emissions from light vehicles with diesel engines. In real circumstances, NO_x emissions from EURO 5 cars type-approved in 2009 now exceed emissions from EURO 1 cars type-approved in 1992 and emit approximately five times the limit. This has a significant impact on NO_2, ozone and secondary particle concentrations around Europe.

In 2011, traffic on motorways, expressways and state roads in Slovenia produced 79.77 tonnes of emissions per day.

Due to technological improvements, emissions of these gases are expected to decline by 2030 to 22.12 tonnes per day.

Figure 80.
Emissions of PM2.5 particles in Slovenia by 2030 – transport



$PM_{2,5}$ particle emissions are also highest in areas with most traffic.

Figure 81.
Emissions of local pollutants in Slovenia

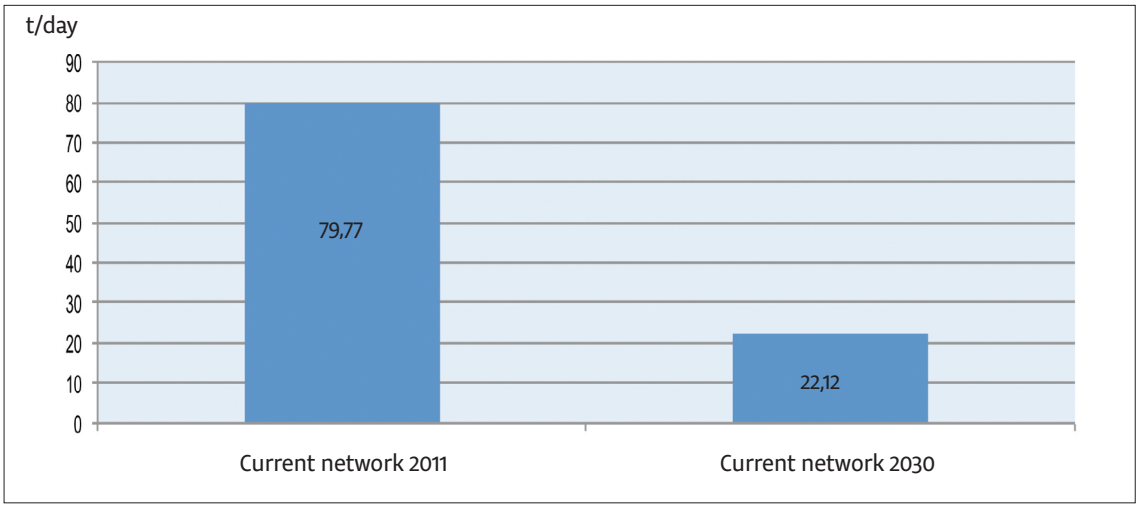


Table 3.33:
Emissions of ambient air pollutants (t/year)

Table 3.33 shows data according to types of pollutant.

Type of gas	2011 (current network)	2030 (current network)
NO_x	7,576	4,363
SO_2	13	18
$PM_{2,5}$	212	50
NMVOC	810	209
Total	**8,611**	**4,640**

Desired state:

- reduce atmospheric pollutant emissions to the point where compliance with the prescribed ceilings of air quality regarding PM_{10} particles and ozone (O_3) are achieved in Slovenia (meeting air quality standards determined in the Decree on ambient air quality (Official Gazette of the Republic of Slovenia, No 9/11) and Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality);

- reduce atmospheric pollutant emissions to the point where national ceilings of emissions of SO_2, NO_x, VOC, NH_3, $PM_{2,5}$ are achieved (national ceilings of pollutant emissions which had to be achieved by 2010 at the latest and must not be exceeded in the future are determined in the Decree on national emission ceilings for atmospheric pollutants (Official Gazette of the Republic of Slovenia, Nos 24/05, 92/07 and 10/14) and Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants. The NEC Directive is being audited, which will set new national emission ceilings for atmospheric pollutant emissions for 2020 and 2030. In 2012, a revised Gothenburg Protocol was adopted, which determines that Slovenia must reduce emissions in comparison with emissions in 2005 by no later than 2020);
- taking into account the guidelines from the Commission Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions regarding the Clean Air for Europe Programme.

Actual state:

- Technological improvements will support the gradual reduction of atmospheric pollutant emissions from new vehicles.

Conclusion:

- Despite lower atmospheric pollutant emissions from new vehicles, transport will remain a major source of ambient air pollution. Additional measures in transport will be required to achieve compliance with air quality limit values and national emission ceilings for atmospheric pollutants.

Proposed measures:

- introduce an efficient and competitive public, especially rail, passenger transport, with the comprehensive integration of the P+R system at the national level;
- construct a competitive railway network to assume more goods transport;
- promote the use of public transport, walking and cycling. promote the use of alternative energy sources, and hybrid and electric vehicles;
- limit the speed of vehicles on motorways, expressways and regional roads to 80 km/h in areas where PM_{10} ceilings are exceeded and at times when these ceilings are exceeded;
- implement sustainable mobility measures in towns.

4.4.4.5 Noise impact

Noise is one of the main problems of our civilisation, as it damages human health. It is particularly produced by road, rail and air transport, and industry. The main source of noise in Slovenia is road transport.

In 2011, approximately 80,000 residents in Slovenia were affected by excessive noise produced by traffic on motorways, expressways and state roads, and the railways as expressed in Ldvn. This is also confirmed by the operational monitoring of noise on state roads managed by the Slovenian Infrastructure Agency, with more than 3 million vehicles per year, whereby it was established that excessive noise in 9,024 buildings affects more than 62,000 residents.

If the transport arrangement remains the same, approximately 100,000 residents (this number does not include noise protection) will be affected by excessive noise produced by traffic on the aforementioned traffic routes in 2030.

Desired state:

- In the short and medium term, nobody must be affected by average excessive noise (L_{dvn}) higher than 65 dB, whereas in the long term, the noise level must not exceed L_{dvn} 55 dBA and $L_{noč}$ 40 dBA.

Actual state:

- Currently, 80,000 residents are affected by excessive noise produced by traffic on motorways, expressways and state roads, and on the railways, which is set to grow to 100,000 in 2030 if the transport arrangement remains the same. 82 per cent of residents are affected by road transport and 18 per cent by rail transport (noise protection is not taken into account).

Conclusion:

- Excessive noise is a national problem, since at the current rate it will affect approximately 100,000 residents by 2030. In reality, even more people are affected by excessive noise, as the calculation does not take into account the impact of local roads.

Figure 82.
Residents affected by excessive noise produced by road and rail transport

Note: red or darker colour signifies problematic areas.

Proposed measures:

- implementation of active and passive noise protection;
- use of silent asphalt (rubber, drainage);
- construction of bypasses (due to excessive noise from state roads) and limitation of speed in settlements;
- introduction of electronic toll collection and thus more efficient transport management;
- promotion of the use of hybrid and electric vehicles;
- planning of transport systems so that (depending on the type of infrastructure) they affect as few residents as possible (so that as few active noise protection measures as possible are required).

4.4.5 Social acceptability

4.4.5.1 Accessibility

In addition to traffic safety indicators, social acceptability is also expressed by social cohesion.

One of the indicators of social cohesion related to transport is the accessibility of the Ljubljana and Maribor cohesion centres by private passenger vehicles and public passenger transport (railway and buses). The ratio between these indicates the differences in options for people who own private passenger vehicles and those who do not.

Figure 83.
Accessibility of cohesion centres by car (PV)

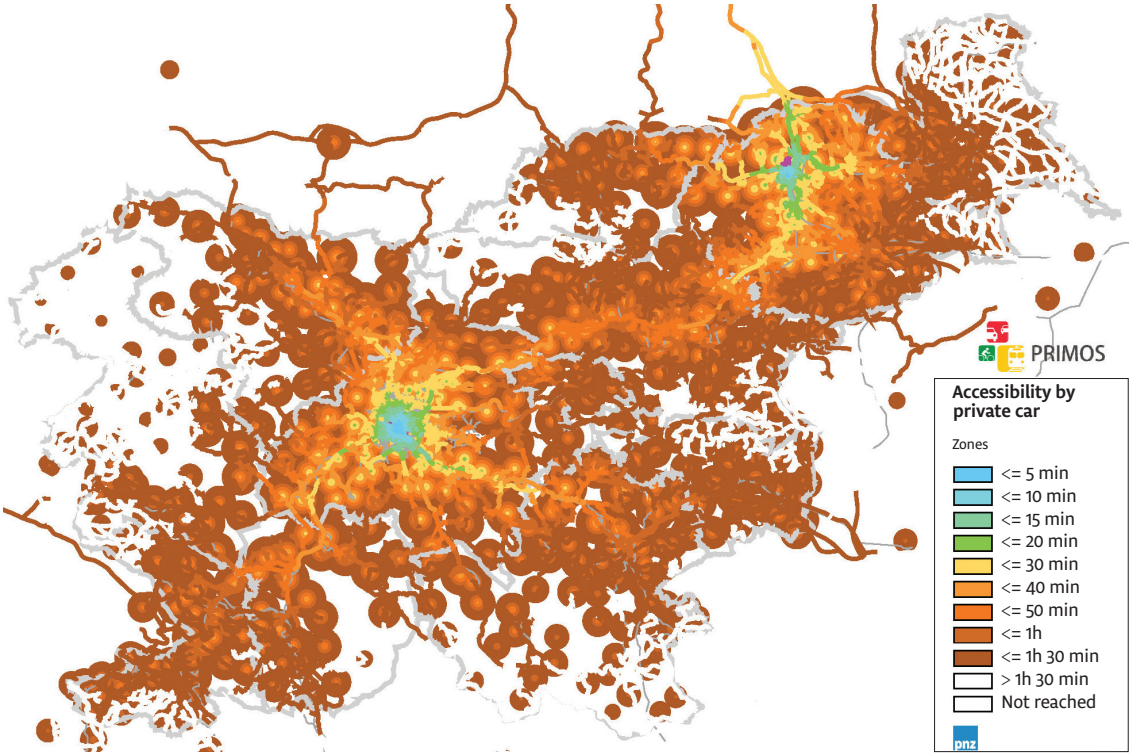
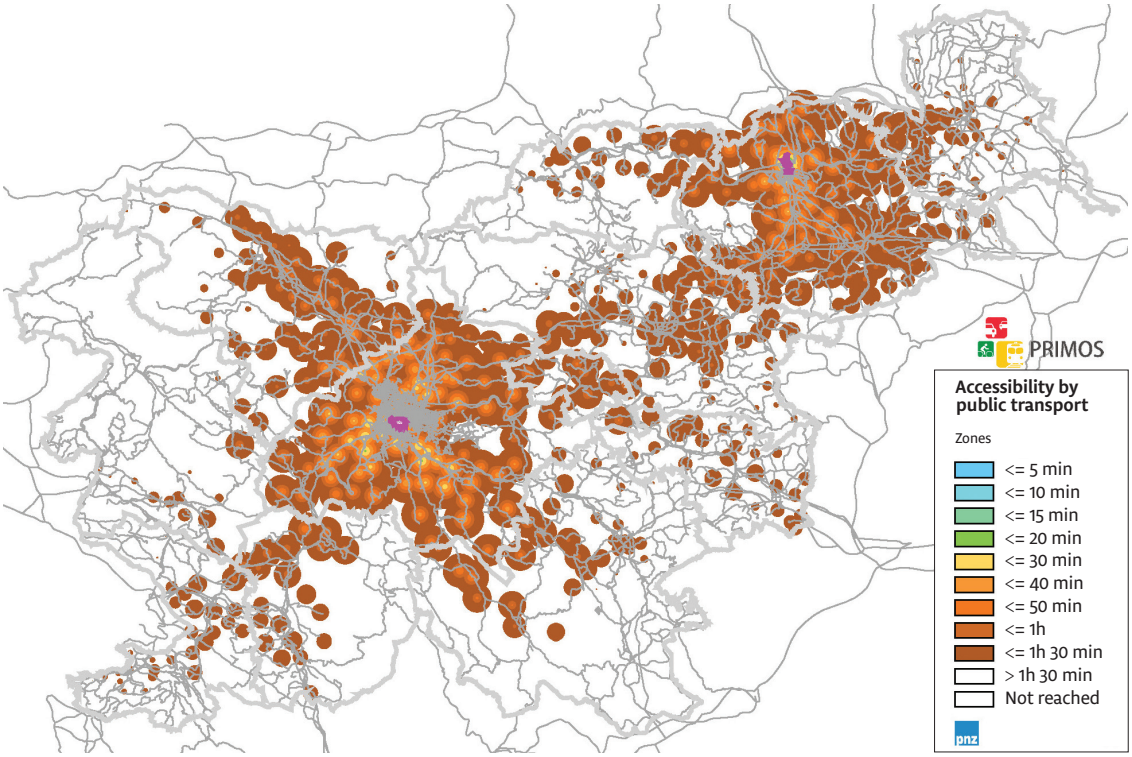


Figure 84.
Accessibility of cohesion centres by public passenger transport

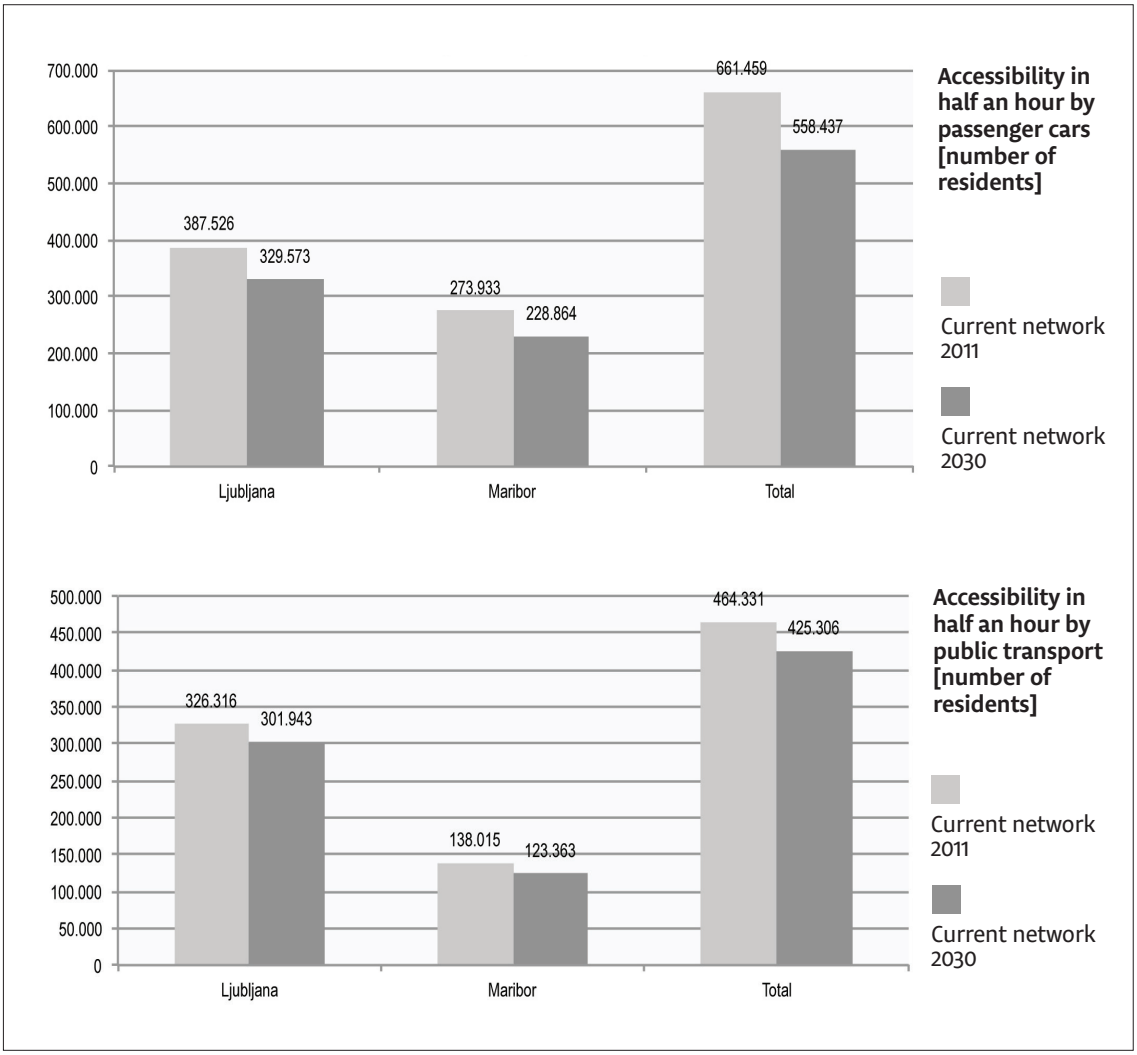


The figures above show that Ljubljana and Maribor are best accessible from areas with the most transport infrastructure and densely built-up areas. They also show that both cities are accessible in 1.5 hours by passenger vehicle from areas that are twice as wide as areas accessible by public passenger transport.

Table 3.34: Accessibility of regional cohesion centres in half an hour by passenger cars and public passenger transport as per the current traffic arrangements (number of residents)

Centre	Year 2011		Year 2030	
	passenger vehicles	public passenger transport	passenger vehicles	public passenger transport
Ljubljana	387,526	326,316	329,573	301,943
Maribor	273,933	138,015	228,864	123,363
Total	**661,459**	**464,331**	**558,437**	**425,306**
PT/PC ratio	**0.702**		**0.762**	

Figure 85. Worsening of accessibility of cohesion centres by passenger cars and public transport



If the current transport arrangement remains the same, accessibility will be poorer in 2030, i.e.:

- by 15 per cent for private passenger vehicles;
- by 8 per cent for public passenger transport;
- accessibility by public passenger transport compared to accessibility by passenger vehicles will improve, but only due to the much poorer accessibility of private vehicles.

Desired state:

- accessibility by public passenger transport should improve;
- accessibility by private passenger vehicles should not be poorer;
- according to the Spatial Planning Strategy of Slovenia, the integration of the settlement and transport network must be ensured so that the accessibility of public services in gravitation areas of centres of national importance (8–15 minutes), and of centres of regional importance in 30–45 minutes is achieved in a sustainable manner, which we have already achieved in terms of calculation, but not in reality (congestions) or by PPT.

Actual state:

- Accessibility by both types of transport could be poorer, more for passenger vehicles than public passenger transport, since public rail transport is independent of road congestion.
- The accessibility of cohesion centres is poorer (unacceptable) from certain areas in Slovenia.

Conclusion:

- Accessibility by public passenger transport will not improve; it will worsen.
- Accessibility by private vehicles will not remain at the current level; it will significantly deteriorate, especially in areas where it is already below average.

Proposed measures:

- introduce efficient and high-capacity public passenger transport with the introduction of a P+R system at the national level;
- eliminate road sections with poor throughput and improve connections to poorly accessible areas.

These two measures would improve social cohesion in an appropriate way, i.e. by significantly improving accessibility by public passenger transport and not worsening accessibility by private vehicles.

4.4.5.2 Traffic safety

Traffic safety in Slovenia has been gradually improving. In the past decade, the number of accidents and fatalities has almost halved. A significant improvement was seen with the introduction of related measures in various fields, from the construction of the motorway network and the introduction of vignettes, amendments to legislation on rules which treat offences of non-compliance with speed limits and driving under the influence of alcohol, drugs and psychoactive substances considerably more severely, and measures at the level of municipalities, to the influence of media and non-governmental organisations. However, according to the number of road accidents per capita, Slovenia still ranks among those EU Member States with an above-average number of accidents.

The causes of road accidents vary (road users, road infrastructure, vehicles, etc.). The share of accidents resulting from an unsuitable road arrangement, and the state of road infrastructure and its maintenance has not been unambiguously established. Estimates vary widely. Undoubtedly, however, unsuitable road arrangements, and road and railway crossings contribute to poorer traffic safety.

Based on preliminary studies, it was established that Slovenia has:

- over 100 crossings that are unsuitably arranged in terms of safety (Slovene Roads Agency);[49]
- 655 km of state roads assessed as high risk (EURORAP);[50]
- 490 passively protected level crossings (only by traffic signs)[51] (a project to eliminate level crossings on the Pragersko–Hodoš section is in progress) and 6 grade-separated crossings of state roads which are being eliminated by the Slovene Roads Agency.

According to data from the Slovenian Traffic Safety Agency, 16,408 road accidents, of which 5,602 caused physical injuries, happened in Slovenia in the January-November 2014 period. There were 101 fatalities, 748 road users with major injuries and 6,656 road users with minor injuries.

545 road accidents or extraordinary events, in which 121 people died, happened at level crossings in the last sixteen years. The majority of extraordinary events occurred at passively protected level crossings marked only with St. Andrew's crosses, namely 71 per cent. The number of extraordinary events is smaller at actively protected level crossings equipped with gates, half barriers or light and sound signals (29 per cent of all extraordinary events at level crossings). In terms of the number of extraordinary events at level crossings, 2013 was one of the safest (25 per cent decrease in number compared to 2012). However, the consequences were more severe (number of deaths (5) the same as in 2012, and the increase in the number of injured was 36 per cent – 9 injured in 2012 compared to 14 injured in 2013). Despite the enhanced scope of protective and repressive measures in this field, almost 30 per cent of extraordinary events still occur at actively protected level crossings, which is mainly a result of the irresponsible behaviour and conduct of road traffic users.

It is generally known that an improvement in traffic safety also yields high economic savings for society as a whole. By reducing the number of fatalities and severely injured in road accidents, costs arising from road accidents decrease proportionally. The Republic of Slovenia loses approximately EUR 700 million per year due to the consequences of accidents in the road subsystem, whereby the estimated material damage of road accidents with fatalities or severely injured is between EUR 200 and 300 million per year.

In terms of road safety, 2013 has been the most favourable so far. Solely because of reducing the number of fatalities and physically injured in 2013 compared to 2012, Slovenian society saved approximately EUR 27 million.

To achieve the goals of the strategy, activities in all fields related to road safety will be needed. The basic classification comprises five fundamental fields:

1. Level of decision-making:

- Political level:
  - Objective: to create a positive atmosphere in society to improve road safety.
  - Activities: provision of political and moral support for the objectives of the National Programme on Road Traffic Safety and financial means.
- Expert level:
  - Objective: to provide the legal and expert basis for achieving the objectives of the National Programme on Road Traffic Safety.
  - Activities: drawing up strategic guidelines and starting points of measures related to the road traffic safety; preparation of harmonised legislation on spatial management and road planning taking into account the "zero" vision principle" and "sustainable road traffic safety" or self-explaining and "forgiving" roadsides; provision of financial means; harmonisation between ministries responsible for individual fields, the operation of which in establishing the road traffic safety is based on cooperation.

49: Determining places with a high frequency of road accidents for the 2010–2012 period, Omegaconuslt, 2013.

50: Evaluation of the state of traffic safety in Slovenia in comparison with Europe, Risk maps 2009–2011, AMZS, 2012

51: Safety at level crossings – "Stop. The train cannot." Activity programme, JARSVP, February 2014

2. Road infrastructure safety:

- Road planning and construction:
  - Objective: to provide sustainable planning and the construction of safe infrastructure.
  - Activities: preparation of a new road classification with an emphasis on road functions; spatial planning taking into account road classifications; provision of road safety assessment in all phases of road planning (also spatial planning) and designing; introduction of the self explanatory and forgiving roads principle in road planning and construction.
- Road management:
  - Objective: to reduce the number of road traffic accidents and their consequences, improve road throughput, improve the compliance with traffic rules, improve the awareness of road traffic users.
  - Activities: the management of road sections with a high number of road traffic accidents must be improved; quality information on road traffic accidents must be provided that will be a basis for the analysis and measures to eliminate such points or sections; short- and long-term measures must be systematically implemented by taking into account the self-explanatory and forgiving roads principle; introduce this principle into road management; introduce new technologies for traffic control; road traffic speed and operation must be managed (ITS); upgrade the systems for road traffic control and management; examine variants and choose the best toll system possible by taking into account economic, environmental, technological and traffic safety aspects; transit goods transport must be routed to roads with better technical elements.

3. Vehicle safety:

- Objective: to provide safe vehicles in road traffic.
- Activities: harmonisation of legislation, training of technical examination providers and control of their work, analysis of results, examining the roadworthiness of vehicles on site.

4. Road users safety:

- Objective: improve road users driving behaviour through education and awareness-raising activities.
- Activities: provision of traffic education and learning in all periods of life also in practice; implementation of safe driving programmes, preventive actions and raising the awareness of all road users; use of media to enforce compliance with traffic regulations and for the explanation of traffic rules; encourage tolerance of less able drivers; provision of efficient control which will also detect and sanction violations to the greatest extent possible.
- Vulnerable road users:
  - Objective: to make vulnerable roads users as safe as possible.
  - Activities: introduction of a sustainable planning by taking into account the function of road and residential environment (separation of vulnerable road users and motor vehicles); reducing speeds of motorised vehicles in settlements; raising the awareness of pedestrians on the use of reflective objects; raising the awareness of motor vehicle drivers on stopping at pedestrian crossings; encouraging cyclists to use helmets; raising the awareness of motorcycle drivers on the driving speed.
- Speed:
  - Objective: to reduce the speed of motor vehicles, particularly in settlements.
  - Activities: to determine permitted speeds on the basis of knowledge on the vulnerability of the human body; provide the credibility of speed limits; reduce the traffic speed at entrance points to settlements, pedestrian crossings and similar critical points; provide efficient control of compliance with speed limits also with new systems; raise the awareness of motor vehicle drivers on the dangers of fast driving.
- Alcohol and other substances:
  - Objective: reduce the share of road users driving under the influence of alcohol, illegal drugs and other psychoactive substances.
  - Activities: lifelong education and raising awareness on the influence of alcohol, illegal drugs and other psychoactive substances on the actions of road users, with a focus on the young;

efficient implementation of alcohol tests for motorcycle drivers; introduction of devices to prevent intoxicated persons from starting the engine of specific means of transport (school transport, passenger transport, commercial transport).

5. Activities after accidents:

- Objective: to provide the best possible operation of all services engaged in activities after an accident.
- Activities: preparation of protocols for activities at traffic accidents and improvement of existing protocols; regular training of services engaged in activities after accidents; provision of adequate organisation and equipment of services, education and raising the awareness of the lay public on actions at traffic accidents; implementation of programme of assistance for road users involved in road traffic accidents and their relatives.

Desired state:

- In the document "Towards a European road safety area: policy orientations on road safety 2011–2020" (COM(2010) 389), the European Commission determined the framework for policy measures on safe infrastructure as the main factor in reducing fatalities in road transport by 50 per cent by 2020.
- The objective of the Strategy is to reduce fatalities by 50 per cent by 2022, and eventually to 0.

Actual state:

- Many dangerous spots and level crossings have been identified on the national road network which significantly contribute to the occurrence of road accidents.

Conclusion:

- Without the remediation of dangerous spots and level crossings, and suitable maintenance of the road network, the number of road accidents could further increase by 2020 due to more traffic.

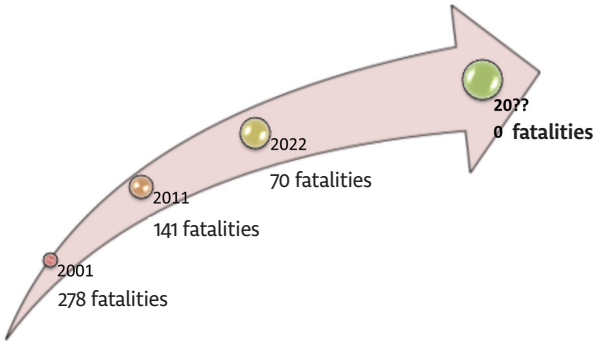


Figure 86.
Vision of the Resolution on the National Programme of Public Transport Infrastructure Development in the Republic of Slovenia by 2020 and 2030

Proposed measures:

- a strategic plan to eliminate dangerous crossings, sections and level crossings;
- rehabilitation of spots on the road network with a high frequency of accidents (reconstruction, lighting);
- rehabilitation of critical sections (reconstruction, speed limits, lighting);
- protection and elimination of level crossings, and construction of grade-separated crossings;
- establishment of a predictable network of self-explanatory roads (SER) and forgiving roads.

4.4.6 Maintenance and other regular costs

As mentioned in the introduction to this chapter, the analysis of the "do-nothing" alternative assumes that the required maintenance will be carried out on existing infrastructure (in addition to the completion of existing investments). To implement and enhance public passenger transport, suitable subsidies must be ensured. Therefore, the investments in the aforementioned fields are shown below.

Maintaining the existing level of services requires constant investment in transport arrangements, i.e. two types of investment are required:

- maintaining transport infrastructure, and
- subsidising public transport train and bus services.

Maintaining a suitable level of services requires constant maintenance of infrastructure. Lack of maintenance or insufficient maintenance reduces the quality of infrastructure, which in turn impairs operating capacity and safety, and has environmental impacts, etc.

Railways entail five types of maintenance costs:

- regular maintenance;
- investment maintenance;
- renovations (MWPI – maintenance works of public interest);
- maintenance of stations and stops; and
- transport management.

Roads entail the following maintenance costs:

- regular maintenance;
- investment maintenance;
- maintenance works of public interest;
- maintenance of stops; and
- transport management from the transport management centre.

Existing condition of road infrastructure

According to the Slovene Roads Agency at the Ministry of Infrastructure, DARS d. d. managed 769 km of roads, while the Slovene Roads Agency managed 5,969 km in 2012. The total length of public roads in Slovenia is 38,986 km.

Table 3.35: Length of road network in 2012

	Roads (in m)	Link roads (in m)	Total (in m)
AC	533,308	143,471	676,779
HC	72,797	19,514	92,311
DARS	606,105	162,985	769,090
G1	351,610	2,339	353,949
G2	459,705	5,996	465,701
Total main roads	**811,315**	**8,335**	**819,650**
R1	948,312	1,964	950,276
R2	1,378,502	4,970	1,383,472
R3	2,178,068	436	2,178,504
RT	636,841	44	636,885
Total regional roads	**5,141,723**	**7,414**	**5,149,137**
DRSI	5,953,038	15,749	5,968,787
Total state roads	**6,559,143**	**178,734**	**6,737,877**
LC	11,415,033		11,415,033
LG	111,634		111,634
LZ	668,302		668,302
LP	1,256,098		1,256,098
Total local roads	**13,451,067**	**0**	**13,451,067**
JP	18,680,343		18,680,343
KJ	116,397		116,397
Total public paths	**18,796,740**	**0**	**18,796,740**
Total municipal roads	**32,247,807**	**0**	**32,247,807**
Total public roads	**38,806,950**	**178,734**	**38,985,684**

Source: Annual Report 2011–2012, Ministry of Infrastructure, Slovenian Infrastructure Agency.

A visual assessment of the condition of road surfaces according to the Modified Swiss Index (MSI) method is carried out on the Slovenian road network every two years. This assessment is the basis for the Pavement Management System (PMS), but the data may also be used to assess the coefficient of the remaining service life, and, indirectly, to establish types of, and reasons for, damage. The MSI method is based on a visual assessment of carriageways, whereby the type of damage is assessed according to its magnitude and size.

When determining the level or value of the MSI, cracks, wear and tear, potholes and patches are taken into account. The visual assessments of the condition of carriageways include a record of their deformity, which is not included in the MSI calculation.

Although the main and regional road network has not significantly worsened in the compared period, the information that only 29.58 per cent of main and regional roads is in very good or good condition is a cause for concern.[52, 53]

The assessment of the state of carriageways on main and regional roads after the latest measurements in 2013 or 2012 is given below.

52: Assessment of the state of carriageways on regional roads (R3 and RT) in the Republic of Slovenia according to assessments in 2012, DRI upravljanje investicij d.o.o., Ljubljana, May 2013

53: Assessment of the state of carriageways on main and regional roads (M1, M2, R1, R2) in the Republic of Slovenia according to assessments in 2013, DRI upravljanje investicij d.o.o., Ljubljana, November 2013

Table 3.36: Assessment of the condition of carriageways on G1, G2, R1 and R2 in 2013

		Condition of carriageways in 2013 by homogeneous sections					
		Very good	**Good**	**Borderline**	**Poor**	**Very poor**	**Sum**
G1	km	33.950	60.150	35.150	46.550	186.200	362.000
	Share in %	9.38	16.62	9.71	12.86	51.44	100.00
G2	km	70.600	60.800	46.750	45.750	251.100	475.000
	Share in %	14.86	12.80	9.84	9.63	52.86	100.00
R1	km	125.000	129.900	123.100	105.600	455.950	939.550
	Share in %	13.30	13.83	13.10	11.24	48.53	100.00
R2	km	183.400	195.600	140.900	185.750	686.800	1.392.450
	Share in %	13.17	14.05	10.12	13.34	49.32	100.00
Sum	**km**	**412.950**	**446.450**	**345.900**	**383.650**	**1.580.050**	**3.169.000**
	Share in %	**13.03**	**14.09**	**10.92**	**12.11**	**49.86**	**100.00**

Source: Assessment of the state of carriageways on main and regional roads (G1, G2, R1, R2) in the Republic of Slovenia according to assessments in 2013, DRI upravljanje investicij d.o.o., Ljubljana, November 2013

Table 3.37: Assessment of the condition of carriageways on R3 and RT in 2012

		Condition of carriageways in 2012 by homogeneous sections					
		Very good	**Good**	**Borderline**	**Poor**	**Very poor**	**Sum**
R3	km	503.000	190.650	167.600	179.550	1.053.000	2.093.800
	Share in %	24.02	9.11	8.00	8.58	50.29	100.00
RT	km	100.900	35.050	47.200	23.350	239.700	446.200
	Share in %	22.61	7.86	10.58	5.23	53.72	100.00
Sum	**km**	**603.900**	**225.700**	**214.800**	**202.900**	**1.292.700**	**2.540.000**
	Share in %	**23.78**	**8.89**	**8.46**	**7.99**	**50.89**	**100.00**

Source: Assessment of the state of carriageways on regional roads (R3 and RT) in the Republic of Slovenia according to assessments in 2012, DRI upravljanje investicij d.o.o., Ljubljana, May 2013

Table 3.38 shows that according to the measurements of 2012/2013, 50.32 per cent of carriageways on main and regional roads were in very poor condition and 10.27 per cent of carriageways in poor condition. According to the measurements of 2010/2011[54], 41.14 per cent of carriageways were in very poor condition and 12.41 per cent of carriageways in poor condition, which indicates the lack of investments in regular and investment maintenance works.

54: Assessment of the state of carriageways on regional roads (R3 and RT) in the Republic of Slovenia according to assessments in 2010, DDC d.o.o., Ljubljana, October 2010; Assessment of the state of carriageways on main and regional roads (G1, G2, R1, R2) in the Republic of Slovenia according to assessments in 2011, DRI upravljanje investicij d.o.o., Ljubljana, November 2011

		Condition of carriageways on main and regional roads					
		Very good	**Good**	**Borderline**	**Poor**	**Very poor**	**Sum**
Sum of 2012/2013	km	1.016.850	672.150	560.700	586.550	2.872.750	5.709.000
measurement	Share in %	17.81	11.77	9.82	10.27	50.32	100.00
Sum of 2010/2011	km	1.234.700	745.050	615.750	693.100	2.298.500	5.587.100
measurement	Share in %	22.10	13.34	11.02	12.41	41.14	100.00

Table 3.38: Assessment of the condition of carriageways on main and regional roads – total

Source: Assessment of the state of carriageways on regional roads (R3 and RT) in the Republic of Slovenia according to assessments in 2012, DRI upravljanje investicij d.o.o., Ljubljana, May 2013

The assessments of the condition of carriageways on motorways and expressways in Slovenia are given below. The data derive from the report from 2011, when the measurements were carried out. MSI is changed and amended annually on the basis of new assessments; the data for 2014 show that the state of carriageways on motorways and expressways deteriorated in the last three years, and that 4.0 per cent of carriageways are in a very poor condition and 14.4 per cent of carriageways in a poor condition.

Table 3.39:
Assessment of the condition of carriageways on MW and EW in 2011

			Carriageway condition in 2011					
			Very good	Good	Borderline	Poor	Very poor	Sum
MW and EW sections in total	AVP	km	446.140	71.726	40.527	25.827	19.052	603.272
		Share in %	73.95	11.89	6.72	4.28	3.16	100.00
	APP	km	456.021	71.748	28.804	24.837	19.606	601.016
		Share in %	75.88	11.94	4.79	4.13	3.26	100.00
	APPP	km	24.661	0.950	0.800	0.350	0.000	26.761
		Share in %	92.15	3.55	2.99	1.31	0.00	100.00
	VVP	km	420.267	99.679	18.725	50.786	11.749	601.206
		Share in %	69.90	16.58	3.11	8.45	1.95	100.00
	VPP	km	425.695	77.969	29.144	55.576	11.239	599.623
		Share in %	70.99	13.00	4.86	9.27	1.87	100.00
	VPPP	km	29.550	3.900	4.000	0.550	0.000	38.000
		Share in %	77.76	10.26	10.53	1.45	0.00	100.00
	Total	**km**	**1.802.334**	**325.972**	**122.000**	**157.926**	**61.646**	**2.469.878**
		Share in %	**72.97**	**13.20**	**4.94**	**6.39**	**2.50**	**100.00**

Source: Assessment of the condition of carriageways in the Republic of Slovenia according to assessments in 2011, DRI upravljanje investicij d.o.o., Ljubljana, October 2011

The length of motorway and expressway lanes that are in a very poor and poor condition has increased, which shows insufficient investment in regular and investment maintenance of motorway sections.[56]

56: Assessment of the condition of carriageways in the Republic of Slovenia according to assessments in 2011, DRI upravljanje investicij d.o.o., Ljubljana, October 2011

The growth in traffic loads on Slovenian roads in the recent years has been significantly higher than initially forecast and anticipated, which means that adjustment has to be made according to the growth in traffic load also through increasing funds for regular and investment maintenance of motorways and expressways, and main and regional roads.

4.4.6.1 Road infrastructure maintenance

To ensure suitable mobility, a road network is being constructed, which must be maintained in a suitable and high-quality condition. This means it must be maintained, repaired and renewed. Road preservation must be based on comprehensive economic treatment, i.e. in the interest of users and operators.

Immediately after their construction, roads are exposed to increasing traffic loads combined with increasing burdening due to climate change. Changes created by these effects in materials built into road structures result in increasingly inadequate structures, depending on the characteristics of external impacts and the current condition of individual elements of road structures. This is called fatigue.

Road elements must be constantly kept in a suitable condition according to objective transport, technical, economic and environmental criteria. On this basis, the types and priorities of measures and the priority list must be determined to provide the conditions for the following:

- maintenance of the substances of roads and facilities;
- maintenance and/or improvement of transport, technical and safety road characteristics;
- safe traffic flow;
- environmental protection against harmful effects of roads and traffic;
- road protection against harmful effects of the environment;
- neat appearance; and
- rational performance of maintenance.

In practice, various procedures for road maintenance have been introduced:

- preventive (planned) maintenance;
- the most suitable maintenance in terms of the condition of roads depends on regular monitoring of the condition, and immediate action when necessary;
- waiting for roads to be demolished is the most costly way to maintain roads, requiring considerable funding, which is usually not available.

The following types of maintenance were defined:

- Regular maintenance of public roads is a mandatory public utility service which comprises maintenance to keep public roads in a condition that ensures their safety and passability, supervision of the conditions of public roads and road areas, and allowing for the passability of roads in cases of natural and other disasters.
- Investment maintenance includes works on public roads that do not change the throughput of the road, the size of its individual elements, the scope of installations, devices and equipment, or other infrastructure in the area of a public road, and that must not intervene with areas outside road areas; such maintenance also includes improvements to road areas related to public road safety;
- Maintenance of public interest includes the reconstruction of public roads that changes the throughput of the road, the size of its individual elements, the scope of installations, devices and equipment, and other infrastructure in the area of a public road, and that must not intervene with areas outside road areas; such maintenance also includes improvements to road areas related to public road safety.

Regular maintenance of state roads comprises:

- regular maintenance of state roads;
- maintenance of state road crossings;
- maintenance of bridging structures on state roads;
- maintenance of state roads at border crossings;
- maintenance of road surfaces, and facilities and devices in settlements;
- maintenance of municipal roads when traffic is redirected;
- maintenance of national cycling connections.

Pursuant to the Roads Act, a National Traffic Management Centre (NTMC) must be established to supervise and manage traffic, and inform the public of the condition of state roads and traffic on these roads, which ensures the collection of all available data on the respective condition in one place; for traffic supervision and management; to inform the public of the condition of state roads and traffic on these roads through the available media.

Regular maintenance includes in particular:

- inspection service;
- regular maintenance of road surfaces (cleaning and repairs);
- regular maintenance of shoulders;
- regular maintenance of drainage;
- regular maintenance of embankments;
- regular maintenance of traffic signalisation and equipment (cleaning, upgrading, replacement or repairs of worn out, damaged, incomplete or missing traffic signalisation or equipment);
- regular maintenance of road amenities and arrangements;
- regular maintenance of vegetation;
- provision of visibility;
- road cleaning;
- regular maintenance of road facilities (cleaning and minor repairs);
- supervision of axle loads, total mass and size of vehicles;

- intervention measures (in cases of natural disasters – storms, floods, landslides, glaze ice and earthquakes, severe road accidents and other extraordinary events, or at the request of the police);
- winter service; and
- establishment of passability following natural disasters.

Table 3.40: Investment maintenance activities

Investment maintenance activities are investments in increasing or preserving the assets of the state, local communities and other investors in public roads which will have later benefits.

BREZ	Restoration of embankments	An embankment is natural or constructed sloped land along a road. This may include the restoration or rearrangement of embankments.
KOLE	Cycling connections	The national cycling network consists of long-distance, main and regional cycling connections. Generally, they are arranged as independent cycling routes, and in settlements also as cycle lanes, cycle lanes along roads or as cycle lanes on pavements. The national cycling connection network is connected to municipal cycling connections.
KRIŽ	Crossroads	A crossroads is a road surface where various traffic flows meet, branch off or intersect. It may involve only traffic lights or changed signalisation or the reconstruction of a crossroads (construction of new lanes, roundabouts, etc.).
MODE	Modernisation	Modernisations of roads are minor reconstructions to replace macadam carriageways with asphalt.
NOVO	Construction of new roads	A new construction is the construction of a new road on new land (new route). New construction activities include motorway slip roads which are not included in the motorway system construction programme and certain other new roads (generally municipal roads) to establish basic communication along the border with Croatia.
OBJN	Construction of new bridging structures	New constructions of facilities are mainly based on the need to relocate state roads due to bad technical elements, or to include the construction of grade-separated crossings which provide greater traffic safety and traffic flow.
OBJR	Reconstruction of bridging structures	This is the reconstruction of the structural elements of a bridging structure or other facility on the road.
OBJS	Rehabilitation of bridging structures	This is the rehabilitation of the structural elements of a bridging structure or other facility, rehabilitation of the road surface and passages for pedestrians, municipal facilities, slip roads and connections to banks.
OBND	Replacement construction of bridging structures	The construction of replacement structures, in particular those which are not worth renovating.
OBNO	Road renovation	The renovation of roads includes not only the renovation of carriageways, but also minor repairs to technical elements of roads to ensure safety without additional activities outside the road area.
OBVO	Bypasses	The construction of bypasses is intended to relieve settlements from transit traffic, in particular when problems in a settlement cannot be solved by any other measure.
OKOL	Environmental protection due to traffic	Environmental protection measures against traffic include measures against excessive burdening of the environment, noise protection measures and biosphere protection measures
PLAZ	Landslide rehabilitation	These measures include the rehabilitation of landslides, subsidence, washouts and other major damages on roads. This is a construction activity to stabilise landslides with suitable procedures.
PREP	Periodical maintenance of state roads	Resurfacing entails more demanding and extensive maintenance works aimed at the long-term arrangement of individual road sections. They are performed occasionally, according to the degree of wear and tear or damage to a road.
PROP	Renewal of culverts	A culvert is a construction facility up to three metres long which passes under an embankment.
REKO	Reconstruction of roads	Reconstructions include all major upgrades of roads through expansions, adjustments routes and their structural parts mainly outside existing roads with additional major activities outside road areas.
URED	Road arrangements through settlements	The measure includes arrangements of roads through settlements which may entail resurfacing or reconstructing roads through settlements, arranging pavements, bus stops, pedestrian crossings, rest areas, tractor paths, traffic calming areas, etc. It also includes measures to improve traffic safety.

ZIDS	Renewal of supporting and retaining walls	Supporting and retaining walls ensure the stability of the entire structure. This may include the renovation of old walls or the construction of new walls.
RVZD	Regular maintenance of state roads	This includes smaller-scale construction, technical and other activities to maintain the condition of roads and roadside areas, traffic signalisation and equipment, and to ensure traffic safety and passability. It also includes supervision of the condition of roads and buffer zones, and the provision of passability in cases of natural and other .
PROM	Transport	The measure formerly included public utility services in line transport, digital tachographs, the establishment of vehicle compliance; today, it includes only the payment of compensation for traffic.
SKUP	Preparatory works for investment maintenance	Preparatory works for investments comprise technical and investment documentation the preparation of which must commence two to three years prior to the planned implementation. The planned funds facilitate suitable dynamics of the preparation.
UPRA	Road administration, management and protection	The measure includes all costs required for the uninterrupted operation of the Slovene Roads Agency (salaries, minor investments, etc.), road management and protection development and research tasks, participation in international projects, quality system management, etc.

4.4.6.2 Railway infrastructure maintenance

The construction and maintenance of railway infrastructure, along with organisational and technological aspects, are also key success factors in a more open, marketable and competitive space, where railways, which acquire almost 60 per cent of the cargo via the Port of Koper, can now be found. The Port of Koper has constantly increased transshipment in last decades, and also become a key traffic hub of European importance.

The total length of tracks in the Republic of Slovenia is 1,228 km, of which 334 km are double-track and 874 km are single-track. The precise division is shown in the tables below

Table 3.41: Basic data on the railway network

Total length of tracks:	**1,208 km**
Double-track	334 km
Single-track	874 km
Electric traction	
Length of electrified tracks	503 km
Length of tracks	**1,541 km**
Structures	
All bridges, viaducts and culverts (number)	3,348
All bridges, viaducts and culverts (km)	17 km
Tunnels and galleries (number)	93
Tunnels and galleries (km)	37 km
Stations (number)	128
For goods transport	11
Total length of tracks:	**1,208 km**
Double-track	334 km

Source: Decree on the Modification of the Decree on the categorisation of railway lines (Official Gazette of the Republic of Slovenia, No 12/13)

- Permissible burdening of tracks: in the Republic of Slovenia, there are 146 km of tracks with permissible burdening of 16 t/axle, 91 km of tracks with permissible burdening of 18 t/axle, 589 km tracks with permissible burdening of 20 t/axle, and 408 km tracks with permissible burdening of 22.5 t/axle[56].
- Electrical energy: all the tracks of Slovenske železnice are fully powered with a direct rated voltage of 3 kV; only on border sections is electrification implemented with the same system as in Austria (15 kV, 16,67 Hz) and Croatia (25 kV, 50 Hz))[57].
- Signalling and safety devices: the Republic of Slovenia has 668 km of tracks equipped with signalling and safety devices[58].
- Telecommunications: 545 km of tracks in the Republic of Slovenia are equipped with digital

56: http://www.slo-zeleznice.si/sl/podjetje/infrastruktura/zeleznisko_omrezje/gradbena_dejavnost
57: http://www.slo-zeleznice.si/podjetje/infrastruktura/zeleznisko_omrezje/elektroenergetika
58: http://www.slo-zeleznice.si/sl/podjetje/infrastruktura/zeleznisko_omrezje/signalna_varnost

telecommunication devices and 324 km of tracks are equipped with a radio dispatch system. (RDZ)[59]
- Level crossings: according to data as of 1 January 2014, there are 830 level crossings in Slovenia, of which 490 are passively protected (marked with traffic signs warning road users of danger and approaching the level crossing), while 340 are actively protected (protected with gates, half-gates or gate poles and visual and audio signal). Most passively protected level crossings are located on the following lines: state border–Metlika–Novo Mesto–Ljubljana, Grosuplje–Kočevje and Novo Mesto–Straža, Pragersko–Središče–state border, Ormož–Murska Sobota–Hodoš–state border, Ljutomer–Gornja Radgona, Grobelno–Stranje–Rogatec–state border, and Celje–Velenje. The majority of extraordinary events occur on the following lines: Domžale–Jarše–Kamnik, Rače–Hoče–Maribor Tezno, Šoštanj–Velenje, Ljutomer–Beltinci, Ljubljana–Brezovica–Preserje, Novo Mesto–Mirna Peč–Ivančna Gorica and Novo Mesto–Straža.[60]

59: http://www.slo-zeleznice.si/sl/podjetje/infrastruktura/zeleznisko_omrezje/telekomunikacije
60: Safety at level crossings – "Stop. The train cannot.", Activity programme, JARSVP, February 2014

Public railway infrastructure is a constructed national asset owned by the State. It consists of facilities and devices required for uninterrupted rail transport, and adjoining land that functionally serves its intended use (Official Gazette of the Republic of Slovenia, Nos 11/11 and 63/13).

Railway lines consist of a substructure, superstructure, signalling safety and telecommunication devices, including powering devices and their facilities, facilities and buildings for traffic management and arrangement, stable devices for electric traction and tracks (Official Gazette of the Republic of Slovenia, Nos 56/13 and 91/13).
Pursuant to the Directive on the interoperability of the railway system within the Community (Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the railway system in the Community (renewal)), three structural subsystems refer to railway lines: infrastructure, energy and control–command, and signalling along tracks.

The infrastructure subsystem refers to tracks, points, engineering structures (bridges, tunnels, etc.), associated station infrastructure (platforms, access zones, including the needs of persons with reduced mobility, etc.), and safety and protective equipment.
The energy subsystem includes devices for electrification, including overhead lines and electricity meters.

The control–command and signalling subsystem includes all the equipment necessary to ensure safety, and to command and control the movements of trains travelling on the network.

The Trans-European railway network (TEN–T) encompasses the main lines in the Republic of Slovenia, of which only the Koper/Trieste–Ljubljana–Zidani Most–Maribor, Pragersko–Hodoš, Maribor–Gradec lines, and a part of the Ljubljana–Jesenice line with a connection to Ljubljana Jože Pučnik Airport are in the core European network. The maintenance, construction or modernisation of the main lines must take into account the interoperability conditions laid down in the Directive on the interoperability of the railway system within the Community (Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the railway system within the Community (renewal)).

Rail wear is measured on the line network of the public railway infrastructure. The measurement is carried out by a measurement train which calculates the following parameters:
- vertical wear of left track;
- lateral wear of left track;
- side wear of left track;
- vertical wear of right track;
- lateral wear of right track;
- side wear of right track;
- track system.

In order to determine local poor points on the track, tolerances published in the Rules on railway line substructure (Official Gazette of the Republic of Slovenia, No 92/2010) and the Rules on railway line superstructure maintenance on public railway lines from 1970 (314) are taken into account.

The Rules on railway line superstructure (Official Gazette of the Republic of Slovenia, No 92/2010) prescribe the permitted wear and tear of the 60E, 54E and 49E track systems and the method/methodology for measuring track wear and tear. When the wear and tear exceeds the permitted value, a track must be changed.

Measurements are used to determine local poor points on the line where the wear and tear on tracks exceed statutory limits. Major maintenance works (overhaul of tracks) must be performed at the determined points, since it is pointless only to change worn out tracks, because the entire superstructure of lines is worn out and requires renovation/replacement.
The poor condition of rail infrastructure is also reflected in the poor throughput – in particular on single-track lines – insufficient axle loads, insufficient length of station tracks, excessive wear and tear of the superstructure and an increasing number of infrastructure constraints, as well as too frequent failures of certain infrastructure elements.

The maintenance of railway infrastructure is the organisation or performance of works needed to preserve its operational capacity and provision of transport safety. It is a public utility service implemented, on behalf of, and for the account of, the State, by its manager, i.e. SŽ Infrastruktura d.o.o. within Holding Slovenske železnice.

The maintenance of structural subsystems, i.e. infrastructure, energy and management/operation and signalisation along the line is divided into regular and investment maintenance or the reconstruction of railway infrastructure (Official Gazette of the Republic of Slovenia, Nos 11/11 and 63/13).

Regular maintenance

Regular maintenance comprises works that maintain the normal operating capacity of a railway line and ensure traffic safety. It also includes so-called substitution in the framework of maintenance, which means the substitution of individual components during preventive and corrective maintenance with works with an identical function and mode of operation (Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the railway system within the Community (renovation)).

Preventive maintenance is the maintenance of structural sub-systems during their life cycle, and is provided through regular inspections and supervision. Corrective maintenance is the maintenance of structural sub-systems in which a sub-system operates until an error or disturbance occurs, followed by the elimination of the error or disturbance, which comprises the elimination of the cause and replacement of the damaged part.

Replacements during maintenance works are performed on the basis of the existing technical or project documentation and do not require a new operating permit.

Regular maintenance also encompasses line inspection, supervision, control and inspection of the condition of tracks, implementation of measurements, planning and organisation of maintenance, managing various registers and records, providing consents for activities in buffer and track zones, implementation of winter service, and provision of passability in case of natural and other disasters. Regular maintenance is carried out as interventions or systematically.

Intervention maintenance means the regular elimination of individual defects established on the basis of track inspections or the data from the measuring service. These are defects that must

be eliminated immediately or within a short time, as they could affect traffic safety or regularity. They encompass local repairs of track width, substitution of individual sleepers, substitution of damaged tracks, substitution of individual fastening or binding material, lubrication of tracks, tightening of fastening material, local repairs of direction and height of tracks or points, adding of stone chippings, laying of switches in continuous welded tracks, etc. Intervention maintenance is usually carried out with hand tools or light hand-held machines without closing the line (in intervals between individual trains).

Systematic maintenance is carried out on the basis of a preliminary prepared plan of required maintenance works which is based on measuring data and the assessment of the general condition of the superstructure. Works are carried out with special machinery for track maintenance, and the line is usually closed.

Systematic regular maintenance includes machine regulation of tracks and points in order to eliminate height and direction-related geometrical errors, sieving, supplementation, stabilisation and profiling of track ballast, chemical destruction of grass and weed in track ballast, machine grinding of tracks, etc.

Permissible tolerances of individual parameters of superstructure are determined in the Rules on railway line superstructure (Official Gazette of the Republic of Slovenia, No 92/10), those of substructure in the Rules on railway track substructure (Official Gazette of the Republic of Slovenia, No 93/13), and for main railway lines also in the Regulation concerning the technical specification for interoperability relating to the infrastructure subsystem of the Trans-European railway system for conventional speeds (OJ L 126, 2011).

Investment maintenance (renewal)

Investment maintenance or renovation comprises works carried out at longer intervals. These are especially the systematic renovation of individual track elements which do not change the entire operation of the railway subsystem or its function (Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the railway system within the Community (renovation)). Regarding the effect, renovation is the same as modernisation, but does not change the parameters of the technical state. It is sometimes difficult to distinguish renovation from regular maintenance, especially from substitution during maintenance, as it frequently includes the same works with the same objective. In terms of replacement, investment maintenance (renovation) differs from substitution in that the latter includes the possibility of achieving the track condition compliant with the TSI, while this is not anticipated during regular maintenance.

A characteristic of investment maintenance is that it is not usually carried out as an intervention at individual locations, but rather over longer sections of line for longer periods and with greater use of materials. Investment maintenance is the result of general and permanent wear and tear on individual elements of the superstructure established on the basis of multiple inspections, observations and measurements with measuring carriages. Investment maintenance of the superstructure encompasses especially the systematic substitution of tracks or sleepers over longer sections of line, the substitution of individual elements of points, substitution of fastening and binding material, sieving, and adding to track ballast.

Rehabilitation of the railway line is included in maintenance works of public interest. Maintenance works of public interest carried out on railway systems are procedures used to implement the removal of structures and devices and rehabilitations, upgrades and constructions of structural sub-systems. They are intended to provide mandatory public utility services with no interventions outside the railway area. Maintenance works of public interest do not require a building permit, even they change the capacity and consequently the size of an individual structure or part of the sub-system.

Public railway infrastructure management

Public railway infrastructure management includes the conclusion of legal transactions related to public railway infrastructure management and station facilities owned by the State, but which are not part of public railway infrastructure.

Public railway infrastructure management also comprises the preparation of a plan proposal for the maintenance of the existing public railway infrastructure and expert groundwork for new development projects of railway infrastructure.

Income generated by the management is used for public railway infrastructure maintenance.

4.4.6.3 Subsidies and compensations of costs

Public passenger transport is a fundamental segment of transport options, as it may be used by all residents both motorised and non-motorised. Therefore, it is an indispensable transport option, since it is a service the State must provide and is thus defined as a public utility service. As a mandatory service that must be provided by the state, it is deemed a public asset due to the public interest.

Income based on acceptable prices of tickets cannot cover all costs incurred by the operation of public transport. For this reason, the state provides carriers implementing this mandatory public utility service with compensation for the difference between the proceeds from the sale of tickets and the actual costs of implementing the service. The state and municipalities also provide free or subsidised transport for some groups of the population. Primary school pupils who reside in settlements over 4 km away from school, pupils who cannot go to school on safe routes, pupils who could be endangered by wild animals on their way to school, and certain groups of pupils with special needs are eligible for free transport. The transport of secondary school and university students, and unemployed people who participate in adult education is subsidised.

Costs of infrastructure maintenance and subsidies

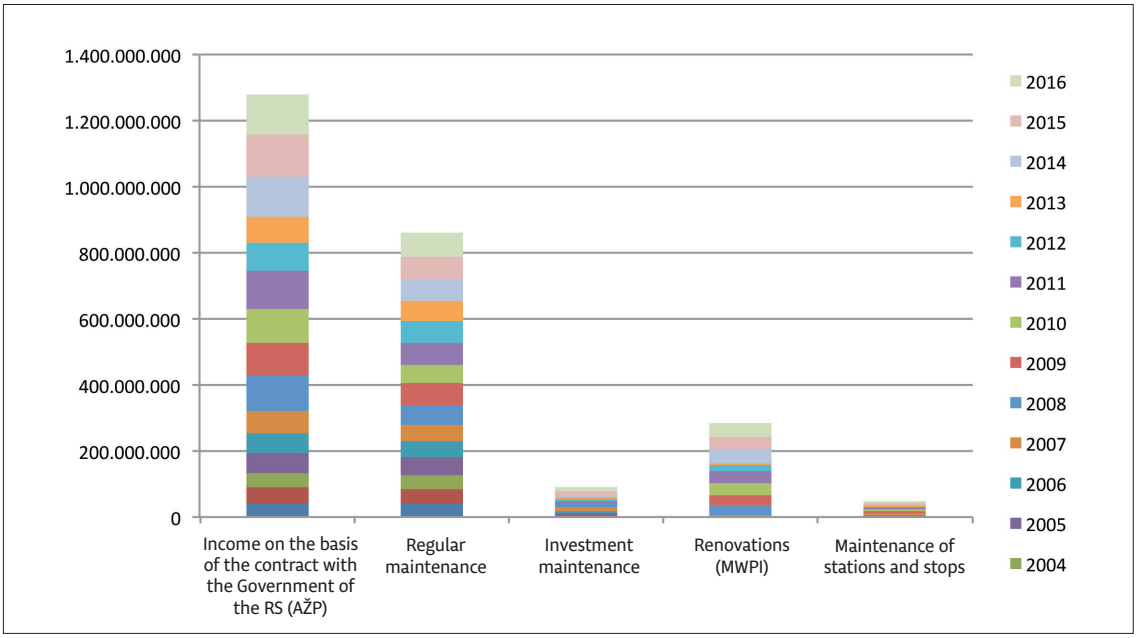
Table 3.42 shows the current maintenance costs of roads and railways (2013), and current costs of state and municipal subsidies, as well as expected required maintenance costs.

Table 3.42: Maintenance and subsidy costs charged to the state budget (in EUR excluding VAT)

Maintenance	**Year 2013 (in EUR)**
State roads	
Regular maintenance	64,837,000
Investment maintenance	43,025,000
Other	19,796,000
Total state roads	**127,658,000**
Railways	
Regular maintenance	61,500,000
Investment maintenance	7,300,000
Renovation	9,000,000
Maintenance of stations and stops	3,688,525
Transport management	33,000,000
Total railway	**114,488,525**
Subsidies and compensations 2013	
Public bus transport	63,003,000
Rail transport	56,375,000
School buses	42,000,000
Total subsidies and compensations 2013	**161,378,000**

Figure 87.
Railway maintenance costs 2004–2016

Source: Annual reports of Slovenske železnice 2012–2002 and SŽ Infrastruktura expert services' assessment for maintenance costs in 2014, 2015, and 2016.



DARS maintains motorways, but these costs are not borne by the state budget. In 2013, DARS allocated EUR 42,679,590 excluding VAT to regular and investment maintenance, i.e. EUR 52,063,000 including VAT or EUR 55,494/km/year excluding VAT.

Total annual costs of maintenance and subsidies borne by the state budget amounted to EUR 403,524,525 excluding VAT in 2013. Investments required to preserve or improve the condition of the network will have to be increased. The determination of amounts of anticipated payments from the state budget must be based on objective and model-supported calculations.

The maintenance of the railways is the most expensive, as it is almost twice as expensive as maintaining motorways and expressways (which do not burden the state budget), and six to eight times more expensive than maintaining state roads per kilometre.
It was assessed that maintenance costs should be 40 per cent higher than currently in all segments of the transport system. This signifies an additional amount of approx. EUR 35 million per year for state roads and EUR 45 million per year for railways, or a total of some EUR 80 million per year excluding VAT.

Desired state:

- Maintain the current level of service by partial improvements.

Actual state:

- The level of financial compensation and subsidies corresponds to the current level of the public passenger transport service, while it is insufficient for the maintenance of public roads and railways.

Conclusion:

- Insufficient funds are allocated for the maintenance of public roads and railways (and motorways and expressways).
- Additional public passenger transport lines and increased frequency of service will also increase the requirements for additional funds for compensation and subsidies.

Proposed measures:

- 40 per cent more funds or approx. EUR 80 million excluding VAT per year should be allocated for the maintenance of public roads and railways (and motorways and expressways), which would be borne by the state budget.
- More economical arrangement of public passenger transport and 20 per cent more funds for compensation.

5 SWOT analysis

A SWOT (*strengths, weaknesses, opportunities, threats*) analysis is a key tool and a basis for forming a transport strategy. A thorough break-down of all transport infrastructure factors gives us a true picture of its real situation, on the basis of which an appropriate strategy can be developed. The SWOT analysis for transport and transport infrastructure in Slovenia shows numerous strengths that should be exploited, and also draws attention to some weaknesses and threats the effects and consequences of which we will try to prevent or at least mitigate by introducing transport policy measures.

Due to its geographical position, Slovenia is an important transit area within Europe, since it is crossed by two TEN-T corridors. Transit transport is dense on motorways and railways, as well as in the Port of Koper. The railway plays an important role in freight transport. In the last two decades Slovenia has built a developed motorway infrastructure. However, a great deal of attention will have to be paid to rail, maritime and public transport in the future.

The basis for drawing up the SWOT analysis was the study "*National Situation and Perspectives for Slovenia in the Field of Sustainable Transport*"; EC, DG-Regio, February 2013. However, it was supplemented for the needs of this Strategy.

5.1 Joint SWOT analysis for transport

STRENGTHS

- geographical position (the shortest link between the Baltic and the Adriatic and the link between SW Europe and E Europe);
- integration into the TEN-T network;
- exit to the high seas with a developed port and established hinterland connections;
- developed motorway infrastructure with connections to neighbouring countries;
- a high share of income from road haulage contractors in the European market;
- transport tradition, especially road transport tradition;
- good accessibility (30-45 min) to jobs and functions in urban (regional) centres and motorway junctions.

WEAKNESSES

- lack of connection between contractors of transport services and lack of connection between different types of transport infrastructure (intermodality, multimodality), absence of logistic centres;
- dispersed population with a high number of settlements (6031), out of which small settlements predominate (3,798 settlements with a population from 50 to 500 inhabitants) and consequently expensive construction and maintenance of infrastructure that can meet requirements in terms of accessibility and connectivity at different levels;
- underdeveloped and unconnected public passenger transport;
- non-competitive railway network compared to the road network (deficient organisation of railway transport, worn out or obsolete railway infrastructure and non-harmonised with TSI – technical standards for the interoperability of railway systems, insufficient number of contemporary means of transport on the railway);
- main, regional and local roads are also unsuitably categorised under administrative-political and not just transport-functional criterion, which is the main reason for the dangerous grey road network with roads that do not fulfil several transport functions simultaneously (grey roads); partly inadequate technical elements, partly inadequate driving surfaces, partly deficient measures for providing traffic safety;
- traffic congestion in the vicinity of large cities reduces actual accessibility and lowers the quality of life;
- high environmental costs and high share of protected areas (Natura 2000);
- dependence of daily commuters on passenger cars (high share of motorisation).

OPPORTUNITIES

- unification and harmonisation of transport systems operation;
- development of new transport technologies (e.g. electric vehicles, new forms of freight manipulation);
- increasing the volume of rail goods transport;
- relocation of production to East Asia; the Northern Adriatic is gaining in importance as an entry port for finished products;
- unification of the existing infrastructure operation: Slovenian service provides would provide comprehensive services instead of partial logistics services;
- further development of (South) Eastern Europe (and Turkey) and its integration into the European Union will enable an increase in transport flows;
- development of contemporary railways on the TEN-T corridors passing through Slovenia, decreasing freight travel time through the whole logistics chain;
- developed capacities and infrastructure of public airports for the international air transport in Slovenia that enable the transport of a considerably more passengers;
- development of intermodal systems (airport-railway-road-port) where the need for such services exist.

THREATS

- redirection of transit transport flows to the parallel network through Italy, Austria, Hungary or Croatia due to too slow development of railway transport infrastructure;
- redirection of freight port transit to North Sea ports due to the inadequate connection of Adriatic ports of Venice, Trieste, Koper and Rijeka and due to unsuitable, especially hinterland rail connections;
- growing traffic jams and reduced safety in freight and passenger transport due to too slow network modernisation;
- increasing suburbanisation—the continuation of the trend of dispersed sprawling settlements with a low population density, which aggravates the establishment of an efficient public passenger transport system;
- continuation of the lack of connection between conductors of public passenger transport;
- regression of the maintenance and development of the network of other state roads, which will not be able to take over transport flows;
- socially unacceptable degradation of (residential) environment;
- civil air transport represents a threat in terms of a quickly developing competitive airport network in the Slovenian border areas (Trieste, Venice, Klagenfurt, Graz, Zagreb, Pula, Rijeka, etc.);
- reducing the possibilities of funding transport infrastructure through the national budget;
- reducing the co-funding of EU in the 2014-2020 period and especially after 2020;
- high environmental costs (including the demands of the Kyoto Protocol);
- increasing number of traffic jams in larger urban areas.

5.2 SWOT analysis for railway

STRENGTHS

- Geographic position
- Integration into the European land transport network, TEN-T network
- Connection of railway to the high seas with a developed port
- Favourable modal split on the railway from the Port of Koper (60% of goods transported by rail)

WEAKNESSES

- Less competitive railway network and (compared to the road network) deficient organisation of railway transport
- Worn out and obsolete railway infrastructure and lack of harmonisation with technical standards of interoperability
- Insufficient number of contemporary means of transport on the railway
- Deficient railway information system and outdated dispatch of passengers
- Lack of budgetary means prevents multiannual maintenance planning of public railway infrastructure

OPPORTUNITIES

- Development of new transport technologies (new forms of shunting)
- Further development of (South) Eastern Europe (and Turkey) and its integration into the European Union will enable an increase in transport flows, especially transit flows on the railway;
- development of contemporary railways on the TEN-T corridors passing through Slovenia, decreasing freight travel time through the whole logistics chain;
- Contemporary activities and projects to upgrade the lines in the TEN-T network are being implemented by increasing the competitiveness of these corridors, as well as the Slovenian public railway infrastructure as a whole;

THREATS

- redirection of transit transport flows to the parallel network through Italy, Austria, Hungary or Croatia due to too slow development of railway transport infrastructure;
- Rising number of traffic jams and reduced safety in freight and passenger transport due to too slow network modernisation;
- Accelerated deterioration of railway infrastructure due to increasing traffic loads;
- Unclear organisational structure in management and the development of investments (new constructions, upgrades, modernisations) and an unclear funding model;
- Unclear vision and strategy of development and management of the railway network;

5.3 SWOT analysis for roads

STRENGTHS

- Geographic position in the European area;
- With the completed motorway system Slovenia, becomes internally connected and integrated to the European system of the motorway network, which will stimulate the emergence of new connections and development;
- Highly developed road network;
- Well-developed motorway network linked to neighbouring countries;
- A high share of income from road haulage contractors in the European market;;
- Road transport tradition

WEAKNESSES

- The dispersed population and often difficult terrain result in expensive construction and maintenance of road infrastructure which could meet the needs for accessibility;
- Dispersed settlements and a great deal of road infrastructure to be maintained;
- Exposure of road infrastructure to natural disasters (floods, landslides);
- Main, regional and local roads: partly inadequate technical elements, partly inadequate driving surfaces, partly deficient traffic safety measures (pedestrians, cyclists);

OPPORTUNITIES

- TEN-T road network, which also runs through Slovenia, integration of the secondary network into the TEN-T network;
- Providing better road safety;
- Roads providing even greater accessibility;

THREATS

- Regression in maintaining and developing the network of other state highways, which will not be able to take over transport flows;
- Increasing road traffic shortens the life span of infrastructure;
- Increasing road traffic loads also cause environmental costs to rise;
- Further deterioration of road infrastructure – high maintenance costs of a very diversified road network.

5.4 SWOT analysis for aviation

STRENGTHS

- Favourable geographic position (next to the motorway network);
- Integration into the Trans-European transport network;
- Proximity of regional centres;
- fast services for passengers, mail and goods;

WEAKNESSES

- Small number of transport providers;
- Limited hinterlands (population);
- Poor accessibility of airports with public passenger transport (road, railway);
- Reduced volume of transport;
- High prices of services
- Spatial and environmental limitations

OPPORTUNITIES

- Capacities and infrastructure of international airports in Slovenia enable the transport of a significantly higher volume of passengers and goods; attracting passengers from neighbouring countries;
- Increasing of the number of airport operators;
- Increasing the volume of the air transport;
- Further transport development in the Middle and Far East;
- Tourism: Establishing new connections (charter) with the growing remote markets in Asia;

THREATS

- A quickly developing competitive airport network in Slovenian border areas (Trieste, Venice, Klagenfurt, Graz, Zagreb, Pula) in civil air transport;
- Late adjustment of the airport's role and the national air carrier to market demands and competition;
- Changes of international standards, recommended practices and legislations (EU and SLO).

5.5 SWOT analysis for maritime

STRENGTHS

- Exit to the high seas through the developed port;
- Port of Koper – excellent starting point for markets of the Middle and East Europe;
- Recognised as a core TEN-T port and a part of priority CEF corridors, i.e. the Baltic-Adriatic and the Mediterranean (which provides its introduction to the Trans-European transport infrastructure network in the future and connection to the target hinterland markets);
- Recognition of the port and excellent reputation of the Port of Koper due to its reliability and adaptability of its services to market needs (good market positioning);

WEAKNESSES

- Limited land accessibility of the Port of Koper through the Koper-Divača single-track line and other sections of the railway network, with poor transport throughput;
- Inadequate depth of entry canals at some locations which will have to be adjusted due to the trend of increasing ship dimensions;
- Limited long-term possibilities of port area expansion due to urban and natural features;
- High ecological sensitivity of the Adriatic;

OPPORTUNITIES

- Further increase in cargo vessel traffic (consolidation of leading role in the Adriatic and car transport in the Mediterranean);
- Growth of commercial activity of international trade through the Suez Cana,l where the transport route to Europe (through the North Adriatic) can be more competitive;
- Upgrade of the railway infrastructure to the Port of Koper and improvement of railway connections with hinterland markets;
- Adoption of the National Spatial Plan with the possibility to increase transhipment, which defines the possibilities for long-term port area expansion (possibility of planning the best possible exploitation of the port area);
- Cooperation of the Port of Koper with other North Adriatic ports (Venice, Trieste and Rijeka) – NAPA, and the impact on the relocation of transport from North Sea ports;
- Further development of passenger transport in the port of Koper (complementarity and stimulation for the Slovenian tourist offer);
- Possibility of increasing the offer of port services through micro-distribution (added value services);

THREATS

- Shift of vessel freight to other North Adriatic ports, which will provide and adjust their capacities quicker (improve their offer, which will be more competitive);
- Shift of freight port transit to North Sea ports because ship-owners will have fewer stops in Europe due to the optimisation of their logistics;
- Too slow adjustment of the Port of Koper infrastructure to market needs (increasing dimensions of vessels, especially container vessels);
- Delayed construction or non-construction of the 2nd track and the lack of modernisation of the railway system in Slovenia;
- Impact of global logistics actors and their interests (necessary integration in their sales networks/products);

5.6 SWOT analysis for public passenger transport

STRENGTHS

- Developed public transport in cities (LJ, MB);
- Widespread network of rail infrastructure for the development of rail passenger transport as the main means for daily commuters to reach city centres (LJ, MB, etc.);

WEAKNESSES

- Poorly developed and unconnected public passenger transport;
- Dispersed population density and consequently expensive infrastructure to meet the needs of public transport;
- Strong competition from private/road traffic;
- Poor connections in chaning transport modes
- Insufficient frequency of transports at a higher number of passengers
- Longer travel time by public means of transport;
- Poor coverage of periods outside peak periods;
- Lower responsiveness of the system to the needs of passengers and local communities and a long waiting periods in a timetable;
- Deficient harmonisation of timetables when chaining transport modes
- Limited and partly unregulated parking at stations;

OPPORTUNITIES

- Establishment of a system of a through ticket – public transport (road, railway, cableways);
- Providing multimodality (on foot, by bike, bus, train, P+R);
- Unburdened road infrastructure;
- Shuttles
- Establishment of a more frequent timetable in the morning, afternoon and night peaks for transporting more passengers;
- Regulated legislation in the field of public passenger transport;
- Higher travel speeds with means of public transport;
- Closing of city centres to passenger cars and thus providing the development of public passenger transport and increasing the number of pedestrian and cyclist areas;
- Public passenger transport service for all generations and raising the level of awareness and importance of public passenger transport;
- Unified information portal
- Harmonised timetable (railway, intercity and city bus transport);
- Zone and destination system with a through ticket;
- Funding of more P+R on the out-skirts of larger cities of the Republic of Slovenia from EU funding;
- Establishment of transport on call to improve services for demographically endangered areas with sparse populations;
- Establishment of intermodal points with an additional offer which makes them more attractive and economically successful;
- Improvement of the public passenger transport vehicle fleet;
- Providing sustainable mobility in urban regions and at the national level;
- Reducing the negative effects of transport in terms of the environment and spatial planning;
- Efficient public passenger transport reduces external transport costs (the effect of reduced use of passenger vehicles and increased use of public passenger transport);
- Regeneration of city centres and service activities, improved pedestrian safety, calmer and quieter life in urban areas where passenger vehicle traffic restrictions apply;
- Reducing harmful emissions;

THREATS

- Increase of population dispersion;
- Further increase in the use of passenger motor vehicles;
- Continuation of a lack of connections between public passenger transport operators;
- Unfair competition between carriers or the possibility of cartel agreements;
- Non-harmonised timetables;
- Use of public passenger transport only by persons without private vehicles (pupils, etc.);

6 Vision, objectives, measures and indicators of transport development in the Republic of Slovenia

6.1 Vision of transport development in the Republic of Slovenia

The basic vision of transport development in the Republic of Slovenia as a whole and also by different transport areas was prepared for this strategy. The visions are not mutually exclusive, but complementary. This is why the basic vision is presented as it was prepared by the working group, while the visions according to divisions are shown as a detailed description of the basic (short) vision.

6.1.1 Vision of transport development in the Republic of Slovenia

Every national transport policy plays an important role in the country's joint policy, since it enables the operation and development of society as a whole. The best possible transport system of a country is one of the fundamental conditions for its efficient operation, since it provides for the implementation of other country's policies, at the same time, it is regarded as a precondition for economic development.

The transport policy vision is thus a part of a common vision of a country and also a necessary condition for its operation. It is defined as the provision of sustainable mobility for the population and supply to the economy. The definition derives from basic traffic and transport activity, which is moving or transferring people, goods and information in space and time. The word "provision" means that a country will ensure the sustainable mobility of the population and sustainable supply to the economy by transport policy measures. The word "sustainable" relates to the efficient operation of a transport system which functions at the intersection of environmental, social and economic aspects. Measures at the intersection of environmental and economic aspects are implementable, but not necessarily socially acceptable; measures at the intersection of social and economic aspect are just, but not necessarily environmentally acceptable; measures at the intersection of the environmental and social aspect are tolerable, but not necessarily economically acceptable. The vision of transport policy strives to implement such measures which will provide the sustainable mobility of the population and sustainable supply to the economy. A schematic diagram of all three aspects with interactions is shown in Figure 88.

Figure 88.
Schematic diagram of sustainable development aspects

6.1.2 Vision of transport development in the Republic of Slovenia by fields

Through the development of transport infrastructure, the Republic of Slovenia will introduce its competitive strengths in the future which arise from its transport position and natural and cultural features. In this area, Slovenia will implement solutions to establish itself internationally as an attractive meeting and connection point, with important effects in tourism, logistics, science, diplomacy, sustainable agriculture and other activities.

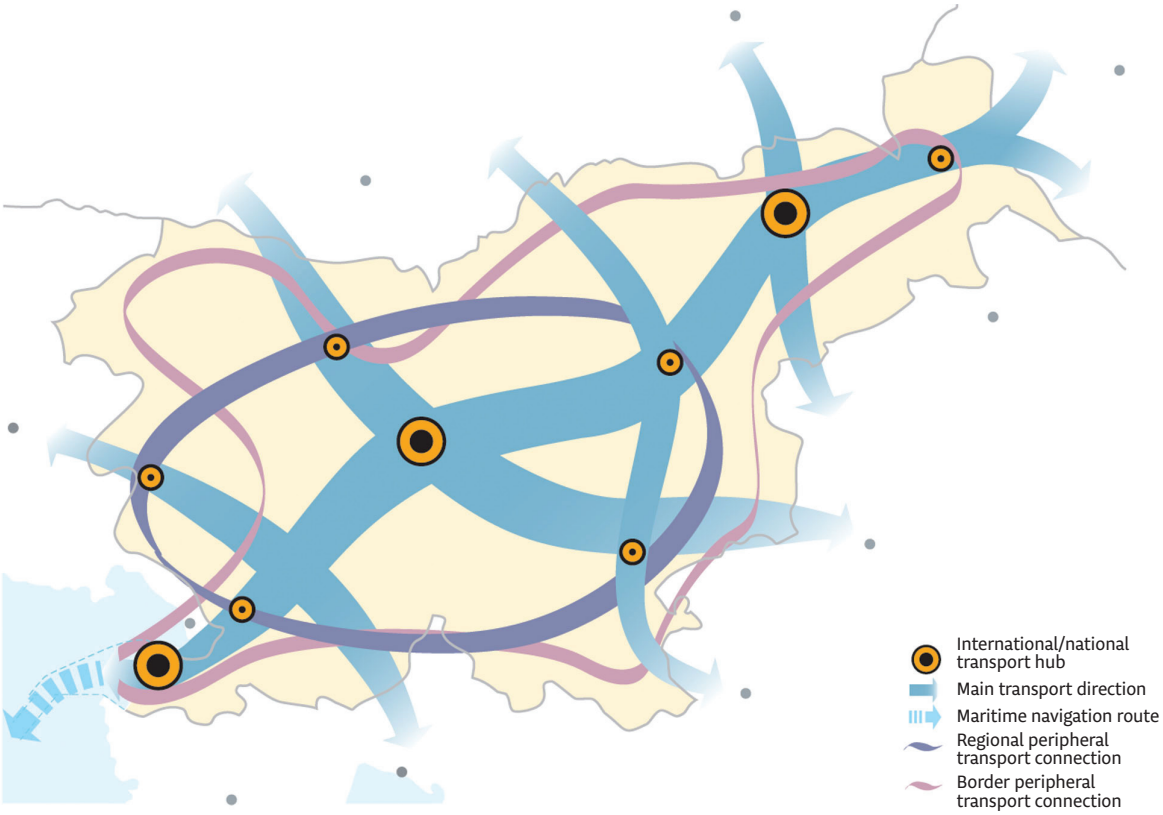
With developed infrastructure, Slovenia will be equally integrated into all modern infrastructure networks: motorways, railways, maritime, river and air transport. Thus, Slovenia will open itself to European and global transport flows. It will also take over some burdens of external costs due to increasing transport flows which will be, on the other hand, compensated with lower relative external costs due to the transfer of freight from road to rail. Also the positive effects of transport development will increase on the basis of reinforced passenger and goods flows and related transport activities.

From the Slovenian spatial development perspective, the main objectives of transport infrastructure development are to provide the population and the economy with the access to functions (jobs, services) and support the development of economic activities, as well as to ensure accessibility or the connection of urban centres and functional and other border regions at the international level. This is why the transport network should be developed as a comprehensive system connecting all forms and types of transport.

Figure 89.
Transport network scheme from the Spatial Development Strategy of Slovenia

Source: MzI, SPRS, Official Gazette of the Republic of Slovenia, No. 76/04

The maritime border between the Republic of Slovenia and the Republic of Croatia is assumed as per the Treaty on the common state border between the Republic of Slovenia and the Republic of Croatia (Appendix 1), confirmed by both governments on 19 July 2001, and initialled by the heads of negotiation teams



If we are to attain these objectives, it is necessary to develop such infrastructure systems that enable the connection and supply of all areas of a country and that are well-linked to European infrastructure systems; support the development of a polycentric network of cities and other settlements and their quality development and residential and working potential, enable mutual complementation of functions of rural and urban areas and contribute to the harmonious

development of all country's regions, including border regions. In this respect, all forms of transport infrastructure need to be considered so as to develop the most economically, socially, environmentally and spatially reasonable and efficient transport forms and flows as a priority.

As a part of large European regions – Alpine, Mediterranean, Danube and Central European – Slovenia must take an active role and use its position, whereby the development of transport connections and infrastructure is essential.

In promoting the cohesion of a broader European area, the competitive position of Slovenian cities in the European urban network is strengthened, and for this reason the efficient connection of Slovenian infrastructure networks to European infrastructure networks (Trans European Network Transport) and Trans-European transport corridors must be provided.

By developing transport infrastructure, the possibilities for exploiting the comparative strengths of Slovenia are thus established, while equal participation in designing cross-border regions and macro-regional connections is provided at the same time.

It should be noted, that cities and other settlements where activities, work and residential areas are concentrated are important for the successful development of Slovenia. Thus, they should be reasonably interconnected within the scope of the regional area and beyond. With their urban way of life they cover most of Slovenia's populated area, while urban centres must be connected into a polycentric network which through an adjustable, comprehensively well-organised structure can respond to the challenges of the economy and European competitiveness and at the same time provide sustainable development and quality of life. Thus, a network of rail and road connections which is functionally linked to the European transport network should be developed in line with the network of cities and other settlements. In this respect, the Port of Koper plays a special role, acting as our window on the world.

For the harmonious spatial development of Slovenia, the development of a polycentric urban system is promoted, which forms a two-stage structured network of centres of national and regional significance to which the network of other centres is connected through a proper division of functions and interrelated transport connections.

The development of a public passenger transport (complemented with non-motorised transport and to a lesser extent with passenger car transport) must be planned in line with the development of urban areas and thus connect cities and other settlements in these areas. Special attention needs to be paid to connections with the public passenger transport between rural and urban areas in an individual region.

To increase traffic flow and accessibility, intermodal transport connections and the development of the railway network to take over the majority of long-distance goods transport in the future should be stimulated. Parallel to the construction of the Slovenian motorway network, a circumferential system of traffic routes should be developed in regard to needs at the regional level, and the railway network should be upgraded and adjusted to higher speeds to take over the major part of a long-distance goods transport.

In terms of spatial policy, rail transport and public passenger transport should be developed as a priority, while the development of all forms of non-motorised transport (cyclists, pedestrians) is emphasised in order to limit the negative effects of motorised road traffic on spatial development and the environment to the greatest extent possible. The integrity of the transport system needs to be provided with a functional connection of all forms of passenger and goods transport.

The vision of development in the field of transport is already defined in Resolution on Transport Policy of the Republic of Slovenia and divided into a vision of population mobility and a vision of supply to the economy.

The vision of population mobility states that the country must provide basic possibilities for the mobility of the population. In the light of this, it should provide an integrated system of public passenger transport that is accessible to users, including airports and ports. To simulate and increase the use of public transport, passengers also need to be educated in order to develop intermodal and sustainable passenger transport: walking-bicycle-car-taxi-ship-bus-train-plane. Special attention needs to be paid to the elderly and persons with physical and sensory disabilities.

In terms of the vision to supply the economy, Slovenia needs integral logistics services and regional intermodal centres. Due to the growing volume of road haulage and environmental problems, it is necessary to stimulate the shift of goods transport from road to rail. One of the possibilities for this is a user charge on a commercial basis which takes into account the marginal social costs (internalisation of external costs). Parallel to this, the development of the Port of Koper needs to continue; logistics and business zones need to be established near airports, and sections with insufficient throughput have to be eliminated at (especially the main) multimodal transport axes.

Special attention must be given to traffic safety and developing intelligent transport system use, namely in terms of population mobility and also supply to the economy. At the same time, security, which gains in importance with the increasing number of terrorist operations, must not be forgotten. Transport with this kind of future orientation will contribute to the economic development of Slovenia and the welfare of its citizens, as well as provide for the sustainable development of transport in the future.

Thus, we have to focus on three main objectives: the construction of a competitive transport network, implementation of integrated public passenger transport, and development of competitive transport logistics.

The necessary supports for the road networks will be established through a policy of internalising externals costs, whereby the user of infrastructure pays a major portion of the external costs incurred by his activities. Along with a more competitive railway infrastructure and liberalisation and modernisation of railway operators, this will cause a shift of freight from road to rail. It is in the interests of the Republic of Slovenia to construct a railway network with a focus on the 5th corridor and thus provide transit and internal goods transport and more sustainable transport for passengers.

Infrastructure development according to individual areas is presented in the continuation of this chapter.

6.1.2.1 State roads

To develop the national road network to a level comparable to the situation in the European Union, Slovenia will have to adopt certain systemic solutions related to the provision of earmarked funds for implementing the priorities of road development and maintenance measures.

Quality road infrastructure is one of the fundamental conditions for harmonised regional development, providing the best conditions for efficient economic operations and indirectly for the settlement of suitable areas in the country. This is why it is necessary to further develop the national road network (construct the best road network, as well as maintain and upgrade the existing road network at the proper level). However, to provide harmonised regional development

– economic as well as spatial development – for interconnecting regions, improving transport services qualities and eliminating insufficient traffic throughput, lowering transport costs, improving traffic safety and reducing the negative impacts of transport on the environment, it is also necessary to implement some further measures, which have to include those development projects at the level of national roads which on the basis of preliminary study, project and investment documents, whose execution will achieve such savings for national road users and residents in their vicinity that they will be economically justified. These are mainly projects related to new road construction, and the reconstruction of existing roads and bypasses which cannot be executed with the budgetary means.

6.1.2.2 Five concepts of railway network development

The wider developmental goals of the programme pursue the combined objective of sustainable development in Slovenia and are as follows:

- preservation of the achieved level of competitiveness of the economy by shortening travel times and reducing transport costs;
- harmonising and/or guaranteeing the interoperability of public railway network with the EU network;
- better accessibility to individual regions and better interregional connection, linking parts of Slovenia that have not been connected appropriately yet to the main European railway corridors, thus enabling a more equal distribution of economic benefits of Slovenia's development;
- improvement of traffic safety.

The wider goals of the development programme are determined by the basic development concepts:

- public railway infrastructure in RS;
- public railway infrastructure for the needs of transit and domestic goods transport;
- public railway infrastructure for the needs of suburban passenger transport;
- intercity and international passenger transport;
- fast long-distance transport;
- common (network) strategic starting points for developing public railway infrastructure.

6.1.2.3 Vision for implementing the public utility service of transporting passengers with cableways

At the 42nd regular meeting, on 3 September 2009, the Government of the Republic of Slovenia took note of the Report of the expert project working group and the document entitled "Guidelines for developing cableway activities in the Republic of Slovenia by 2017" as a basic development paper to promote cableway activity in Slovenia. At the 142nd regular meeting, on 5 June 2011, it adopted Decision No 3760-1/2009/19 ordering the Ministry of Transport (now MZIP) to define the role and importance of cableways in detail and assess the possibilities of including this kind of transport in the public transport system.

The main objective of co-funding the operation the so-called transport cableways is to ensure the long-term economic sustainability of cableway activity along with the reasonable management of physical space as a rare natural resource. It has been established that the objective is attainable through the spatial, business and capital collaboration of existing cableway centres, the creation of tourist destinations in the mountains and a selection of measures to improve the efficiency and quality of the offer provided by cableway centres, while taking into account acceptable extensions in terms of environmental and spatial capacities. In accordance with this finding, the Government

of the Republic of Slovenia decided that the common basic process phases of the sustainable development of mountain tourist destinations must be defined in detail, whereby special attention must be paid to cableways conducting transporting passengers throughout the year.

Cableways transporting passengers may be an integral part of the public passenger transport network. The Alpine states include them in different modes of transport – they are used to link road, rail transport and other rail-related transport, as well as waterways.

The basic purpose of passenger cableways is to provide public passenger transport in areas where they are the best possible substitute for road transport (e.g. Mariborsko Pohorje, Golte, Velika planina, Krvavec) and at the same time are accessible to tourist operators. This kind of cableway transport complies with the Regulation on a Mode of Implementing Economic Public Service on Passenger Public Line Transport in Inner Road Transport, which provides for the public service of public line transport also in areas which are tourism generators, and defines the accessibility standard as at least three departures per day, regardless of the population in the respective area.

The operation of passenger cableways also provides for the sustainable mobility of the population and visitors to these areas, since other modes of transport may be limited (e.g. complete road closure).

The inclusion of passenger cableways in the public transport system is possible and most favourable in terms of integrated public passenger transport (IPPT), which could promote a sustainable journey from home to the destination to which the passenger cableways are connected.

Pursuant to Article 38 of the Cableway Installations Designed to Carry Persons Act (Official Gazette of the Republic of Slovenia, Nos 126/03, 56/13 and 33/14; hereinafter referred to as: ZŽNPO), a municipality may determine that the public passenger transport can be carried out as a public service on cableways:

- in the area of a town;
- as a continuation or a link in a line of city transport;
- which are the only or a necessary link with populated mountainous area or other area with difficult access.

Based on the concession, the public service is implemented by a concessionaire for the construction of the cableway installation on which this service is implemented.

If not otherwise stipulated by ZŽNPO, the provisions of the act governing the concessions of public utility services apply in terms of the procedure for granting the concession, the content of the concession act and concession contract, the rights of the concession operator and concession provider, transfer, duration and termination of the concession relationship.

The co-funding of the implementation of cableway transport is justified by:

- creating (at least maintaining) jobs in cableway centres, resort and destination;
- increasing consumption in cableway centres, resorts and destinations;
- linking with the PPT system;
- the aspect of accessibility in all seasons (at least three departures per day) at cableway centres which are tourism generators;
- the nature conservation aspect (cableway transport is the most acceptable in terms of ecology);
- providing the long-term economic sustainability of cableway activity along with the prudent managing physical space as a scarce natural resource.

According to calculations, the costs of providing accessibility to passenger cableways would amount to just over EUR 736,000 per year, which is the basis for determining the amount of compensation. To prepare the assessment of the financial shortfall upon the introduction of a public transport system with passenger cableways, the following was carried out:

- a review of costs for each cableway separately (staff costs for operation and maintenance, energy costs, costs of spare parts, protection and rescue operations, insurance of activity, amortisation, recognised profit);
- physical inspection (the length of cableway, transport capacity, difference in altitude, time of travel);
- operational inspection (evaluation of the ticket for each separate journey, time schedule and time of operation, etc.).

The inclusion of passenger cableways in the integrated public passenger transport system (IPPT) would have positive effects on the rate of return of rail and bus transport in these areas and would increase the effects in the areas where these cableways operate. The funds to provide the inclusion of passenger cableways in the IPPT system would be at least partially reimbursed by improving the occupancy of public means of passenger transport.

The invested funds also have numerous effects in the environment where passenger cableways operate, and due to which it is justifiable for local communities and economies in these environment to co-fund these systems. The analysis of the multiplier effects of operating ski slopes indicates that:

- one job on the passenger cableway creates 15.3 jobs at the destination;
- one euro of income on the passenger cableway creates EUR 10.10 of income at the destination.

In addition to the effects of consumption and employment, the implementation of transport with passenger cableway installations also includes a nature protection aspect and accessibility in all seasons.

To co-fund the operation of passenger cableway installations, ZŽNPO should be amended so that the state or a municipality determines the implementation of a public utility service, and a decree on more detailed conditions and requirements to implement public transport should be adopted.

The draft act foresees that the foregoing service could be determined by the state or a local community as a selective public utility service under the following conditions:

- public transport of passengers can be conducted only with funiculars or cableway cars which provide complete protection of passengers against weather conditions and must be available to all passengers;
- a cableway installation is a link between settlements or a link in the cableway system;
- the provision of transport connections (accessibility) to other remote locations in terms of the unavailability of other transport systems or unfavourable weather conditions; and/or
- provision of performing economic activities, which would not be possible without public transport; and/or
- provision of an indirect or direct cross-border connection.

6.1.2.4 Development of maritime and navigation in the inland waters

Maritime ports for international public transport in Koper, Izola and Piran, as well as the river port for international public transport in Brežice (Obrežje) on the Sava River are being modernised and developed. Simultaneously, the development of facilities for the safety of navigation and facilities as well as devices for the supervision of a separate navigation system in the joint navigation chart for the Northern Adriatic in the area of the Gulf of Trieste, and facilities and devices for supervising

the safety of navigation in the area of the river port near Brežice and the section of the Sava River between Krško and Obrežje, where the Sava international inland waterway is located, is being provided. In the Port of Koper, a space for mooring "ships in distress" is also provided. In the area of the ports (Koper, Izola, Piran) appropriate area for maintaining vessels is also ensured.

A part of the Port of Koper which is functionally linked to the city is intended for the arrangement of the main passenger terminal for national and international maritime passenger transport. To stimulate national public and regular international passenger transport, the existing ports in Ankaran, Izola, Piran and Portorož are being developed and modernised; in Piran and Izola, the activities could also include an upgrade for the international passenger transport of large tourist vessels.

The Port of Koper is one of the most important strategic platforms in the Republic of Slovenia, since it carries out all main transport and logistics activities of national and wider regional importance. It has a distinctively favourable geographical position for supplying the markets of Middle and Eastern Europe, in particular in relation to fast-growing markets through the Suez Canal (the Middle East, India, the Far East).

To improve the competitiveness of the Port of Koper with neighbouring ports, the timely construction of the new Koper-Divača railway track is especially important, along with a timely completion of operational wharves for the transshipment of containers and vehicles and for the arrangement of hinterland storage areas.

The Sava international inland navigation route pursuant to the category of the navigation route between Sisak, Croatia and Obrežje, Slovenia, has been established with the construction of the hydro-energy chain on the Lower Sava at the section between Krško (Nuclear Power Plant Krško) and Obrežje and navigation infrastructure (ship launching facilities). On the border between the Republic of Slovenia and the Republic of Croatia near Brežice, the river port is being developed for international goods and public river passenger transport, which according to the given conditions can develop at various locations.

According to the given navigation possibilities, the port infrastructure and regional navigation routes are being developed on the rivers and natural or artificial lakes, while on the river sections such as the Mura, Drava, Kolpa and others which run along the national borders, a port and adequate navigation infrastructure for international river transport, especially of passenger and tourist vessels can be developed pursuant to international treaties.

6.1.2.5 Development of public air transport infrastructure

The public air transport infrastructure will enable the development of civil aviation, more intensive connection with other commercial fields, especially tourism, and the integration in the comprehensive transport network of the Republic of Slovenia, and thus attain the goal and positive consequences of intermodality.

6.1.2.6 Sustainable transport logistics (goods transport)

In the respective field, Slovenia mostly deals with transportations. If Slovenia is to exploit all capacities of transport activities, the focus should be on transport logistics, which will create new high added value jobs. Logistics activity can create 14% of GDP, so the development of sustainable transport logistics which has positive effects on reducing external costs must be promoted in future. This is beneficial to the quality of life and traffic safety, and relieves the

environment. Without a competitive railway infrastructure and modern intermodal transport terminals, sustainable transport logistics is not possible. Logistics centres and transport terminals of combined transport and transshipment points are not necessarily a part of public transport infrastructure, but can be privately owned. The practice of public-private partnership must be promoted.

Sustainable or green logistics in cities plays a great part in the supply of the economy, and also influences the way of life. The improvement of supply chains in cities will not affect the quality of life in cities. Green city logistics systematically competes with other functions in the city, such as the residential environment, shops, services, etc. in the scope of the historical circumstances, current facts and future plans.

Transport logistics occupies space, creates transport and jobs, and apart from the environmental limitations (air quality (PM10, etc.) and noise issue, constitute an important factor in strategic spatial and transport planning.

In implementing measures, priority will be given to those activities which incorporate good practice, and the Government strategy and strategies of local self-governments.

1. In the short term, the existing infrastructure must be properly maintained, and transshipment locations must be modernised and equipped (transport terminals of combined transport). In improving supply chains, the existing public infrastructure must be used in the best way: roads, railway lines, maritime connections, logistics hubs, intermodal and multimodal centres, transport terminals, industrial tracks and transshipment locations.
2. In the long term, new transport infrastructure must be modernised and built where it is needed, and new logistics hubs and transshipment points which are to be located in the close vicinity of their users must be established. Logistics centres of different importance and size could be established in these areas: In Corridor V (Šempeter-Vrtojba, Sežana, Koper, Pivka, Ljubljana, Celje, Maribor, Murska Sobota, etc.) and in Corridor X (Jesenice, Brnik, Ljubljana, Novo Mesto, Brežice, etc.), as shown in Figure 9.
3. By internalising external costs, where the user of infrastructure pays for a major portion of external costs incurred by his activities, the necessary elements in road networks will be established which will enable a shift of goods from road to rail, along with a more competitive railway infrastructure and the liberalisation and modernisation of railway operators. Tolls for goods vehicles in transit should include charging for these external costs.

Sustainable logistics in cities will be achieved through: improved efficiency of transport (higher exploitation of capacities), intermodality (options of shifting transport modes), the sound management of urban demand for goods, and the use of environment-friendly vehicles (e.g. electric-powered vehicles).

Transport logistics

In the past in Slovenia, a major part of transport activity was related only to the goods transport. If all capacities and advantages of transport activity are to be truly exploited, more attention has to be given to logistics. It will create new high added value jobs. Logistics activity can generate a 14% share of GDP. Therefore, higher private investments in logistics centres have to be provided in the future through public incentives. In this way, the more efficient exploitation of various transport modes will also be ensured.

Thus we have to pursue the objective of attaining synergies and promote or enable the development of logistics which in transport creates high added value jobs.

The advantage of the geographical position of Slovenia is the proximity of fast-developing European regions acting as development generators. In this context, transnational and interregional cooperation plays an important role. Slovenian cities and regions can use this to improve their competitiveness in a wider area. Due to knowledge and understanding of conditions in the West Balkans, Slovenia may participate in the processes of economic development of this area. Slovenia is also a hub of important European routes. Pan-European corridors V and X meet in Slovenia and are linked with the more important centres in the urban system of the country (Koper-Ljubljana-Celje-Maribor and Jesenice-Kranj-Ljubljana-Novo Mesto). The entire transport network of Slovenia, including two sections towards Croatia, is also a part of the integral TEN-T network, and also a major part of the core TEN-T network. Two corridors of the Mediterranean and Baltic-Adriatic core networks also run across Slovenia. Here, Slovenia has not fully exploited its competitive edge so far, in particular in the field of railways and logistics.

Thus, the vision of transport development pursues vital national interests and is intended to attain three main objectives: the construction of a competitive transport network, integrated public passenger transport and development of competitive transport logistics.

Intermodal infrastructure

Transshipment points (intermodal terminals and terminals of combined transport) have to be modernised and equipped, while the needs of new transshipment points which are to be located near their users by taking into account the economic and environmental justification have to be studied.

Intermodal infrastructure has to provide for efficient manipulation and added value in the supply chain at the conjunction of at least one transport mode. Thus, we differentiate:

- Intermodal railway infrastructure with terminals and logistics centres;
- Intermodal maritime transport logistics with hinterland terminals and logistics centre;
- Air transport logistics with intermodal terminals and logistics centres;
- Road transport logistics with intermodal terminals and logistics centres which connect one or more of the above-mentioned transport modes.

Public and private sphere

In general, the public and private sphere must be distinguished. The domain of the public sphere includes transport infrastructure, system management and monitoring of operators, while the private sphere manages human and material resources, controls the flows of material and constructs logistics platforms. Both spheres are related to the economics of transport logistics on the one hand and supply chains on the other.

Logistics centres and intermodal terminals are thus not necessarily a part of public transport infrastructure, but may be a part of the commercial (private) activity of transport logistics. By developing and modernising the public transport infrastructure, appropriate and free access to their services must be enabled. Through participation in public-private partnerships, solutions can be devised quickly and optimally with a national or commercial initiative as an answer to the current needs and requirements. Only through a combination of proper infrastructure and administrative measures and incentives can the goals of sustainable logistics services be attained. The existing infrastructure needs to be exploited in planning supply chains and the timely supply of the economy where there exist industrial tracks related to the public railway infrastructure, otherwise combined transport is used to enable decision-makers in the economy to select the optimum transport, e.g. road-railway-road, "door to door" road transport.

Modal shift measures (Shift of transport to more environment-friendly means of transport)

Measures of rerouting transit cargo from roads to railways:

- Tolls for goods vehicles should include the charging of external costs; through a policy of internalising externals costs, where the user of infrastructure pays for a major portion of external costs incurred by his activities, necessary elements in road networks will be established which will enable a shift of goods from road to rail, along with a more competitive railway infrastructure and the liberalisation and modernisation of railway operators;
- Stimulation of the application of intermodal transport units;
- Modernisation of intermodal terminals;
- Modernisation of public road and railway infrastructure; in addition to the internalisation of external costs, investments are also necessary, particularly for the construction of a competitive railway network providing transit and internal goods and passenger transport in a sustainable manner. For the most part, the motorway network is already constructed;
- Incentives for commercial entities to reconstruct and re-use industrial tracks.

In terms of transport flows and economic interests, there are areas in the Republic of Slovenia where logistics centres of varying importance and size could emerge. Such areas in Corridor V are Šempeter– Vrtojba, Sežana, Koper, Pivka, Ljubljana, Celje, Maribor, Murska Sobota, etc., while some are also in Corridor X: Jesenice, Brnik, Ljubljana, Novo Mesto, Brežice, etc.

Green city logistics

Sustainable or green logistics in cities plays a great part in the supply of the economy, and also influences the way of life. The improvement of supply chains in cities will not affect the quality of life in cities.

Green city logistics systematically competes with other functions in the city, such as the residential environment, shops, services, etc. in the scope of the historical circumstances, current situation and future plans. The public sector needs to revive the skills needed for sustainable goods transport by providing a dedicated area for this type of services. This means introducing devices and tools into the comprehensive system of city logistics with the cooperation of the public (city) and private (commercial) sector, and town and landscape architects. These three sets of factors come together in city logistics platforms, expressing and forecasting needs and proper solution to these needs. The issue of increasing external costs which is most evident in the quality of life in Slovenian cities is related to noise, PM10 (air quality) and traffic jams. The impact of so-called green city logistics (supply chains and logistics centres) on the development of individual cities, along with the calculation of external costs, may be also be seen in the analysis of the quality life in cities.

The objectives of accomplishing sustainable logistics in cities will be attained with:

- Improved transport efficiency (better exploitation of capacities);
- Intermodality (options of shifting transport modes);
- Good management of city needs in terms of the supply of goods; and
- Application of more environment-friendly vehicles and energy products.

Implementation activities

In implementing acts and projects, priority will be given to those activities which incorporate good practice, and the Government strategy and strategies of local self-governments.

The organisation of logistics is based on economic and spatial criteria, whereby optimisations of fright flows are conducted on the basis of data on production, consumption and infrastructure.

The planning of infrastructure and capacity depend largely on the existing situation in transport and the market and on the capacities of a certain area (city, country, etc.).

Transport logistics occupies space, creates transport and jobs, and apart from environmental limitations (air quality (PM10, etc.) and noise issue) is an important factor in strategic spatial and transport planning.

6.1.2.7 Public passenger transport and sustainable population mobility

To provide sustainable mobility in terms of population mobility and sustainable development, an efficient system of public passenger transport (hereinafter referred to: PPT) must be established, the physical connection of transport subsystems must be provided for the efficient implementation of the public utility service of transporting passengers, and a comprehensive selection of measures for managing mobility to reduce pollution caused by passenger vehicle transport must be implemented. The effects of measures of sustainable mobility are multi-layered, from health, environmental, spatial to social and financial effects. This is a comprehensive approach to planning mobility development which takes into account all aspects of sustainable, environmental, economic and social development and is harmonised in the respective area.

The need to reduce greenhouse gas emissions and increasing oil prices in world markets put the mobility development planning in a completely new position. Settlements must be planned in such a way as to depend less on passenger vehicles, while people have to be encouraged to change their travel habits, which in the long term will lead to a better quality of life and better transport safety.

Integration of transport subsystems

To provide the operation of integrated PPT, it is necessary to provide the integration of transport subsystems with a uniform ticket and intermodal transfer points, which will enable users to switch efficiently between different transport modes. The provision of modern transport centres will introduce a new dimension of sustainable mobility into local communities and increase the attractiveness of public transport. The PPT service should be comprehensively complemented with the "Park and Ride" system, adequate numbers of covered/secured parking spaces for bicycles and a system of pavements and cycling lanes for safe access to PPT stations. The arrangement of public passenger transport stations has to be pursuant to the Rules on bus stations (Official Gazette of the Republic of Slovenia, No 106/11) and the Rules on railway stations and stop facilities (Official Gazette of the Republic of Slovenia, No. 72/09 and 72/10).

Improvement of possibilities for pedestrians and cyclists

Access with non-motorised transport modes, walking and cycling as a part of sustainable mobility, is often neglected at the implementation level in Slovenian spatial planning practice. Therefore, it has to be given the role which pertains to it in contemporary transport planning. A continuous network of pavements and cycling lanes has to be created to provide citizens safe walking and cycling. By planning transport generators such as shopping centres with only road connections, without pavements or cycling lane, citizens are literally forced into bad travel habits and increasing dependence on vehicles. At the same time, those citizens who do not drive a car (minors, disabled persons, elderly, socially endangered persons, etc.) are placed in an underprivileged position in terms of accessibility. Safe access to PPT stations and stop facilities on pavements and cycling lanes and the arrangement of bicycle racks and projecting roofs for bicycle stands will provide sustainable mobility to the greatest extent possible.

Planning sites of large transport generators

It is of a great importance for a more efficient PPT to properly plan larger transport generator sites along the lines or in the vicinity of PPT stop facilities. Residential neighbourhoods, hospitals, shopping centres, education centres, faculties, stadiums and other facilities should be located in the close vicinity of PPT stop facilities, or the lines and required infrastructure for PPT implementation should be designed in line with the site plan of such facilities.

Parking standards and parking policy

According to the existing transport infrastructure and developmental needs, it is necessary to study the measure of the Maximum Parking Standard. Cities in Slovenia and several other European countries prescribe minimum parking standards for new constructions, i.e. the smallest number of parking places in regard to the intentional use of the new construction. Some countries and cities have started to adopt maximum parking standards due to transport issues, i.e. maximum number of parking places in certain settlements (especially their central parts) with which they contain the growth of transport at locations where transport density is too high according to the selected criteria (environmental, infrastructural, etc.).
Through higher parking prices in city centres and lower prices on their outskirts in combination with an efficient Park and Ride network, the parking policy of cities should prevent over-density of cars in city centres.

Regional aspect of PPT planning

When spatial planning the development of activities in it is necessary to take into account the specifics of municipalities in terms of their location and size, while the system of public transport and measures of sustainable mobility should be planned in relation to neighbouring municipalities or at the regional level (provision of PPT to larger employment centres, education and care facilities, etc.).

Improvement of PPT service

Constant monitoring of passengers' travel habits and needs is needed to plan future passenger transport development, and thus appropriate research studies are also conducted.
The PPT service can also be improved through the existing transport system for elementary school minors, which is being conducted as a special line transport and under specific conditions can also provide public line transport – at the same time, all passengers, also random passengers, are transported, which improves the PPT service and is more economical public at the municipal and national levels. Municipalities should study spatial options for the integration of school and public line transport and logically plan the required infrastructure to implement it.

Upgrades and improvements of the management system of the integrated public transport

PPT management has to be constantly adjusted to current needs in society and upgraded with efficient programmes and tools for managing and controlling it and a system for measuring its efficiency. For successful IPPT system management, it is necessary to establish an operator which will operatively manage and control the subsystems of passenger transport by railway and intercity bus lines and also provide the integration with the city passenger transport managed by municipalities.

Accessibility standard

The accessibility of public passenger transport needs to be evaluated in terms of the distances to the closest public passenger transport stop facilities. Despite the principled guidelines about the site positioning of large transport generators closest to PPT stop facilities, it is often the case at the implementation level that new constructions have no alternative to access by passenger vehicle. This deficiency can be overcome by implementing PPT accessibility standards.

An accessibility standard in terms of adequate PPT frequency needs to be provided so as to adjust timetables to citizens in accordance with their transport needs and ensure that PPT actually provides efficient transport.

Guidelines on preparing a comprehensive transport strategy

An important aspect of sustainable mobility development is the preparation of comprehensive transport strategies at the municipal level which fully follow the principles of sustainable mobility. By applying guidelines, municipalities dispose of a tool for comprehensively managing transport at the local level, where public transport will play an important role in the future sustainable transport system or by which the conditions are created for public transport to exploit its capacities in a comprehensive offer of all transport modes.
Strategic and comprehensive transport planning goes beyond the current planning practice, which still pays too much attention to increasing road infrastructure capacity. The result is a lower quality of life and high public expenditure on constructing road infrastructure.

The guidelines are available on the web pages of the Ministry of Infrastructure under the section 'Project integrated public passenger transport/Project activity'.

Educational and awareness-raising activities as support for changing travel habits

Education, informing and awareness-raising of the public on the importance of sustainable mobility are important for changing the travel habits of citizens of the Republic of Slovenia. Depending on the different target groups, different measures and approaches need to be prepared to address various target groups of public. Some already tested and efficient models should be applied, such as "European Mobility Week" for the general public, and various didactic games, such as "Traffic Snake" and "White Bunny" for schools and kindergartens, the preparation of mobility plans for large institutions, introduction of mobility centres and mobility advisers, etc. Efficient approaches lacking for other target groups have to be developed and implemented nationally.

Application of modern technologies for efficient mobility management

The attractiveness of public passenger transport depends on numerous factors, one of which is information on the arrival of PPT vehicles at stop facilities. Information on vehicle locations in real-time is important for the public passenger transport provider (control), as it is for the conductor of transport (vehicle fleet management).

Green PPT rolling stock

In order to reduce the number of traffic jams and occupancy of parking lots and provide a cleaner environment, a transport mode with public (green) cars needs to be tested.
For the public utility service of transporting passengers by road and rail, compliance with environmental standards is considered upon the purchase of new vehicles.

6.2 Objectives of transport development in the Republic of Slovenia

6.2.1 General objectives

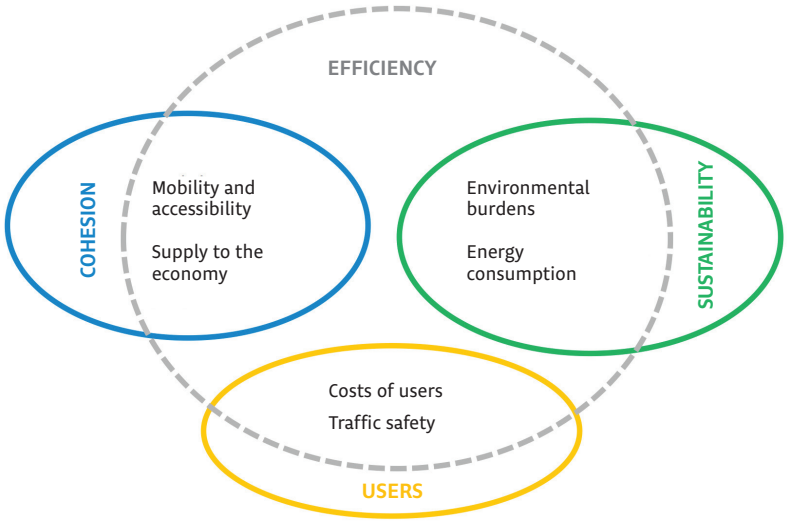
The general objectives of transport policy which ensure that the vision is realised are determined on the basis of the vision. Objectives are:

- improve mobility and accessibility;
- improve the supply to the economy;
- improve traffic safety and protection;
- reduce energy consumption;
- reduce costs to users and operators;
- reduce environmental burdens.

The last objective (the reduction of environmental burdens) is also crucially related to the objective of reducing the burden of diseases caused by inadequate transport pursued by the Ministry of Health. Therefore, the measures defined on the basis of this objective will also include the area of health.

Objectives are harmonised with the objectives of the TEN-T ordinances on the technical specifications for interoperability in terms of the "infrastructural" subsystem of the Pan-European railway system for conventional speeds (2011/275/EU): the Commission's Decision of 26 April 2011 on a technical specification for interoperability relating to the "infrastructure" subsystem of the Pan-European railway system for conventional speeds (notified under document C(2011) 2741)).

Figure 90.
Schematic display of the harmonisation of general objectives with the objectives of the TEN-T Regulation



6.2.2 Special objectives as per the mode of transport

Railways:

The developmental programme objectives of railway infrastructure pursue the joint objective of sustainable development of Slovenia, and are as follows:

- increase economic competitiveness by reducing travel times, eliminating the low traffic flow and reducing transport costs;
- harmonise and/or guarantee the integration of the public railway network with the EU network;
- improve accessibility to individual regions and interregional connections;
- improve traffic safety;
- reduce the environmental burden;

- improve traffic management efficiency;
- reduce operating costs;
- introduce interoperability;
- observe the TEN-T standards (22.5 tons of axle pressure, speed of 100 km/h, electrification; ERTMS, length of trains up to 740m) in the core TEN-T network, where this does not cause disproportionately high costs;
- observe standards pursuant to the TSI for the entire TEN-T network;
- provide arranged and safe PPT stations and stop facilities.

Aviation:

- provision of safety, regularity and smooth operation of air transport which is in the public interest;
- provision of a continuous development of standards, recommended practices and regulations in the field of aviation;
- provision of continuous development of aviation infrastructure and the infrastructure of navigation air transport services;
- provision of continuous and efficient control of the conduct of all civil aviation activities;
- provision of connections between the country, industry and research and education institutes;
- provision of adequate connections between airports and other infrastructure (roads, railway);
- stimulation of the connection of a wider commercial environment with civil aviation;
- provision of infrastructure for alternative fuel.

Roads:

- reduction of travel times between regions;
- elimination of bottlenecks or low traffic flow;
- provision of higher traffic safety by eliminating congestion points of traffic accidents and implementing applicable national and EU legislation;
- provision of an adequate and interoperable mode of toll service, pursuant to EU legislation;
- improvement of the situation of the parallel national road network through planned management (maintenance and investments in the construction of new sections and bypass roads of settlements), where necessary;
- provision of adequate traffic areas for non-motorised participants in traffic by upgrading the existing network of cycle routes;
- provision of adequate and secured parking lots at the motorways, approximately at every 100km;
- provision of the infrastructure for alternative fuel.
- provision of arranged and safe PPT stations and stop facilities.

Maritime:

- improvement of the navigation safety by providing adequate technical and organisational conditions for control, monitoring and notifications in maritime transport (e.g. the establishment of the VTS centre, provision of adequate facilities and qualified personnel, automation of navigation safety facilities, keeping of cartographic and hydrographic data, etc.);
- quality educational and qualification programmes of seafarers pursuant to the requirements of the STCW convention;
- increase in port capacities and the volume of transshipment through the Port of Koper;
- provision of adequate hinterland, especially rail connections;
- development of motorways of the sea and stimulation of short-distance maritime transport;
- increase of entries in the Slovenian Ship Register;
- reducing administrative burdens and strengthening cross-sectoral cooperation by establishing a single window for maritime transport and other solutions for exchanging information in maritime transport;
- development of inland waterways by connecting to European waterways through the international Sava navigation way ;
- provision of infrastructure for alternative fuel.

6.3 Basic measures in transport development in the Republic of Slovenia

Based on the aforementioned objectives, individual basic measures at the first level which enable the achievement of individual objectives are determined. Some measures guarantee the fulfilment of various objectives, some of which complement each other; others compete, however; at the same time they increase the realisation of each objective.

The basic measures are:

- optimisation of the public passenger transport system;
- raising awareness of the public and education:
- modernisation of the existing transport infrastructure;
- new construction of the best possible transport infrastructure;
- provision of appropriate connection of the port with the hinterland;
- expansion and technological modernisation of the port;
- expansion and technological modernisation of airports and air transport navigation services;
- development of logistics centres;
- introduction of modern means of transport;
- provision of technical applicability of transport means.

The relation between objectives and measures is shown in Figure 91. Figure indicates what objectives are fulfilled by individual measure. Thus, e.g. the measure 'New construction of optimum transport infrastructure' fulfils all six objectives.

Figure 91.
Objectives and measures matrix

	MEASURES/ OBJECTIVES	1 improvement of mobility and accessibility	2 Improvement of suuply to the economy	3 Improvement of traffic safety and protection	4 Reduction od energy consuumption	5 Reduction of costs to users and operators	6 Reduction of environmental burdens
1	optimisation of public passenger transport	■				■	
2	raising awareness of the public and education			■		■	■
3	modernisation of existing transport infrastructure	■		■	■	■	■
4	new construction of the best possible transport infrastructure	■	■	■	■	■	■
5	provision of adequate connection of the port with the hinterland	■	■			■	■
6	expansion and technological modernisation of the port		■				
7	expansion and technological modernisation of airports and air transport navigation services	■		■			
8	development of logistics entres	■	■			■	■
9	introduction of modern transport means			■	■	■	■
10	provision of technical applicability of means of transport			■		■	■

The selection of all possible measures within ten basic measures will be prepared according to individual transport types. How individual measures meet individual objectives will be established on the basis of indicators prepared for individual objectives.

6.4 Indicators of transport development in the Republic of Slovenia

The indicators of transport development in the Republic of Slovenia as per general objectives are:

Objective 1 – improvement of mobility and accessibility for the population and Objective 2 – improvement of supply to the economy:

The indicators which define the improvement of mobility and accessibility of the population are partly the result of a transport model and partly of statistics, and also a result of individual measures, such as the number of vehicles/thousand inhabitants.

- length of sections with exceeded throughput [km]
- number of locations with limited bearing capacity
- number of passenger vehicles or motor vehicles/thousand inhabitants;
- number of vehicles powered by alternative fuels/inhabitant
- number of journeys/inhabitant
- number of journeys by bus/inhabitant
- number of journeys by train/inhabitant
- number of journeys by passenger vehicle/inhabitant
- travel time/travel by bus [min]
- travel time/travel by train [min]
- travel time/travel by private vehicle [min]
- number of journeys by bus [pkm]
- number of journeys by train [pkm]
- number of journeys by passenger vehicle [pkm]
- number of bus journeys [vehicle km]
- number of passenger train journeys [train km]
- number of passenger vehicle journeys [vehicle km]
- total travel times of passengers [h]
- number of inhabitants with up to 15 minutes accessibility to PPT station or stop
- number of inhabitants with up to 15 minutes accessibility to MW junction
- number of inhabitants with up to 30 minutes accessibility to regional centre – PPT
- number of inhabitants with up to 30 minutes accessibility to regional centre – passenger vehicle
- number of inhabitants with up to 30 minutes accessibility to regional centre
- modal split PPT/private transport
- share of passenger kilometres in rail transport
- share of passenger kilometres in bus transport

The indicators must indicate positive effects in the observed period

Objective 3 – Improvement of traffic safety and protection:

- number of traffic accidents per year
- number of lightly injured persons per year
- number of seriously injured persons per year
- number of deaths per year
- number of protected car parks

All indicators for improving traffic safety and protection are projected to decrease in the observed period, except for the number of protected car parks.

Objective 4 – Reduction of energy consumption:

- fuel consumption – gas [litres]
- fuel consumption – oil [litres]
- fuel consumption – electricity [kWh]
- energy used for ntkm [kWh]
- energy used for ptkm [kWh]

All indicators for reducing energy consumption are projected to decrease in the observed period. The energy consumed by all means of transport will increase due to the volume of transport. However, the objective is for energy consumed per unit to decrease. This will cause transport costs to drop and have a positive impact on economic growth.

Objective 5 – Reduction of costs to users and operators:

- time-related costs [EUR]
- costs of energy use [EUR]
- costs of vehicle maintenance [EUR]
- costs of infrastructure maintenance [EUR]
- noise costs [EUR]
- CO_2 costs [EUR]
- NO_x costs [EUR]
- costs of solid particles PM10 and $PM_{2.5}$ [EUR]
- cost of traffic accidents per year [EUR]
- costs of measures for individual alternatives in [EUR]

The indicators defining users' costs are projected to decrease, especially costs per unit. Some indicators are a direct result of the transport model, some of them indicate economic categories, and must be calculated on the basis of intermediary results of the transport model.

Objective 6 – to reduce environmental burdens:

- noise load on roads [dB/inhabitant]
- noise load on railways [dB/inhabitant]
- CO_2 [t/year]
- NO_x [t/year]
- solid particles PM_{10} [t/year]
- solid particles $PM_{2.5}$ [t/year]

Based on Objective 6, the reduction of environmental burdens, the following indicators related to the public health in the Republic of Slovenia can be monitored:

- number of patients with, and deaths from, respiratory diseases;
- number of patients with, and deaths from, cardiovascular diseases;
- number of patients with, and deaths from, lung cancer.

The objectives and indicators which measure objectives are general and refer to the whole country. Some problems and measures are general and concern the whole country, while the others are more specific and concern specific areas. This part is prepared by areas for the needs of finding specific problems and their respective measures. Figure 92 shows seven functional areas for which specific problems are determined relating to transport and transport infrastructure, and measures to solve these problems.

Figure 92.
Traffic-gravitational areas for which specific problems and measures are determined

Seven traffic-gravitational areas in general extend over twelve statistical regions, whereby new administrative and other regions are not foreseen. The purpose is especially to describe problems related to transport and transport infrastructure in these areas, and to determine measures.

1. North-eastern Slovenia comprises two statistical regions, i.e. Štajerska and Pomurje. With its motorway connections, the area is well connected with the international (TEN-T) and the regional network. The Pragersko-Maribor-Šentilj and Pragersko-Hodoš railway corridors are part of the core TEN-T network, so it is important to provide sufficient capacity and compliance with the TEN-T standards. Adequate multimodal suburban and city connections to the cohesion centre of Maribor have to be provided.
2. South-eastern Slovenia covers the Spodnjesavska statistical region and part of the South-eastern Slovenia statistical region (Bela Krajina). The main problem is the accessibility of the Bela Krajina area to the regional centre of Novo Mesto and the motorway network (third development axis).
3. North-western Slovenia encompasses the Gorenjska statistical region, where the area of Kranj and Škofja Loka is also closely connected with the capital city of Ljubljana. The main problem is the Ljubljana-Jesenice single-track railway line with poor throughput for goods transport, while passenger transport services also have to be improved. Problems also occur in the suburban connection of Škofja Loka with Ljubljana, the tourist centres of Bohinj, Bled, and Cerkno.
4. The Goriška area covers the Goriška statistical region, where accessibility from the Soča River valley to the regional centre of Nova Gorica and Central Slovenia presents the main problem (fourth development axis).
5. Koroška's greatest problem is its poor accessibility to the motorway network due to the attained throughput on certain sections as one of its weaker characteristics (third development axis).
6. In Primorska, the biggest problems are the traffic flow of the Koper-Ljubljana corridor for goods transport (especially the existing railway lines) and the connections to tourist centres and the Croatian border.
7. Central Slovenia extends beyond the statistical region, since it also includes Notranjska, the area of Kočevje (3A development axis), Zasavje and Spodnja Štajerska (Celje) where traffic flows mainly gravitate towards Ljubljana. Accessibility to Ljubljana (the Ljubljana motorway ring, suburban and regional connections) and the low provision of public transport services are regarded as major issues.

7 Measures for attaining the objectives of the transport development strategy in the Republic of Slovenia

On the basis of the foregoing analyses, objectives and definitions, specific objectives and measures were determined for their fulfilment according to transport areas and their impact on specific objectives. This is shown below in four interdependent tables. All types of tables combined present the proposed transport development strategy, whereby the measures are not determined at the level of projects.

7.1 Determination of general and specific objectives of the Strategy

The Strategy observes six general objectives. Four specific objectives are assigned to these six objectives, which more specifically determine measures to eliminate the established problems. For each of the four specific objectives, the aspects and/or traffic-gravitational areas where certain problems are to be solved are determined in detail. Each specific objective and the aspects and areas to which it relates is adequately described to clarify which problem it deals with.

Specific objectives and sub objectives of the strategy

- Specific objective No. 1: improvement of transport connections to, and harmonisation with, neighbouring countries;
  - Sub-objective 1a: Elimination of congestion on the border
  - Sub-objective 1b: improvement of the accessibility of international passenger transport (including transit traffic)
  - Sub-objective 1c: improvement of the accessibility of international goods transport (including transit traffic)
- Specific objective No. 2: improvement of national and regional connections within Slovenia
  - Sub-objective 2a: North-eastern Slovenia
  - Sub-objective 2b: South-eastern Slovenia
  - Sub-objective 2c: North-western Slovenia
  - Sub-objective 2d: Goriška region
  - Sub-objective 2e: Koroška region
  - Sub-objective 2f: Primorska region
  - Sub-objective 2g: Central Slovenia region
  - Sub-objective 2h: accessibility within regions (to regional centres)
- Specific objective No. 3: improvement of passengers' accessibility to the main city agglomerations and within them
  - Sub-objective 3a: Ljubljana
  - Sub-objective 3b: Maribor
  - Sub-objective 3c: Koper
- Specific objective no. 4: improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability
  - Sub-objective 4a: harmonisation of legislation, rules and standards with European requirements and best practice
  - Sub-objective 4b: improvement of the organisational system structure and cooperation between respective Stakeholders
  - Sub-objective 4c: improvement of the operational system structure
  - Sub-objective 4d: improvement of transport system safety
  - Sub-objective 4e: environmental impact reduction/mitigation
  - Sub-objective 4f: improvement of energy efficiency
  - Sub-objective 4g: financial sustainability of the transport system

7.2 Determination of measure to attain individual specific objectives

The description and reasons for the measure are given for each of twenty-one sub-objectives of a group of measures, which are divided into general measures and measures related specifically to rail, road, public passenger transport, air and maritime transport and urban centres. The measures are not represented at the level of concrete projects, but at the level of established needs (at the strategic level).

The means of transport or area to which a specific measure relates is marked in the left-hand column of the table. R – rail, Ro – road, A – air transport, M – water-borne transport and U – urban centre.

7.3 Review of measures for attaining individual specific objectives

This shows the relation between the measures and specific objectives. Green cells mean that the measure definitively attains the specific sub-objective, whereas yellow indicates that the attainment of the objective is not completely certain.

The table shows that all of the measures fulfil certain objectives and all measures fulfil all objectives.

Table 7.1: Display of objectives, specific objectives, measures and the relation between measures and specific objectives

General comparison of alternatives	Railway transport	Road transport	Public transport	Maritime transport	Air transport
1a Elimination of congestion on borders					
1b Improvement of the accessibility of international interurban passenger transport					
1c Improvement of the accessibility of international goods transport					
2a North-eastern Slovenia					
2b South-eastern Slovenia					
2c North-western Slovenia					
2d Goriška					
2e Koroška					
2f Primorska					
2g Central Slovenia					
2h Accessibility within regions (to regional centres)					
3a Ljubljana					
3b Maribor					
3c Koper					
4a Harmonisation of legislation, rules and standards with European requirements and best practice					
4b Improvement of the organisational system structure and cooperation between respective stakeholders					
4c Improvement of the operational system structure					
4d Improvement of the transport system safety					
4e Environmental impact reduction/mitigation					
4f Improvement of energy efficiency					
4g Financial sustainability of the transport system					

Legend:

- fully compliant
- partially compliant
- conditionally compliant
- non-compliant

Table 7.2:
Display of objectives, specific objectives and their aspects, and areas

Objectives (general and specific)	Description
GENERAL PURPOSE AND OBJECTIVES OF THE STRATEGY	The general purpose of the plan is to achieve an efficient and sustainable system for passenger and goods transport in the Republic of Slovenia. The following general objectives, which are pursuant to the rules, standards and decrees of the European Union, will be taken into account in all the measures proposed in the plan to fulfil this purpose, namely: – improvement of mobility and accessibility, – improvement of supply to businesses, – improvement of traffic safety, – reduction of energy consumption, – reduction of users' costs, – the environment.
SPECIFIC OBJECTIVES	
1 Improvement of transport connections to, and harmonisation with, neighbouring countries	Slovenia is an important transit country for passenger and goods transport and the country of the origin and destination (for all transport modes concerned). The main objectives are to provide sufficient network capacity which also meets the TEN-T standards (speed, axis load, length of trains) and to eliminate major congestion on state borders.
1a Elimination of congestions on borders	The congestions on state borders during the tourist season (roads to Croatia, Austria) and single-track railway lines (Austria, Hungary) and operational issues (Italy) (railway line).
1b Improvement of accessibility of international passenger transport (including transit transport)	Capacity issues (the area of Ljubljana for transit transport, airport terminals), and issues related to the level of services (intercity passenger trains) for transit transport. Multimodal accessibility to the main network.
1c Improvement of the accessibility of international goods transport (including transit transport)	Capacity issues (the Port of Koper, Koper-Ljubljana railway line, Ljubljana railway hub), compliance with TEN-T standards (where appropriate and economically viable). Issues remain, especially with the increasing importance of the NAPA ports (increase of transshipment). Multimodal accessibility to the main network.
2 Improvement of national and regional connections within Slovenia	Ljubljana, Maribor and Koper are the main economic, political and administrative centres in the country. Regional centres provide basic services in a particular region. Thus, a better connection of all regions to these three major national centres is to be ensured (shorter travel time, level of services for public transport, better conditions of roads, where this is necessary), as well as proper services and accessibility within the scope of the region with its centre.
2a North-eastern Slovenia	The objective of the plan is to improve the connection of Pomurje to Maribor. North-eastern Slovenia comprises two statistical regions, i.e. Štajerska and Pomurje. With its motorway connections, the area is well connected, namely to the international (TEN-T) and regional network. The Pragersko-Maribor-Šentilj and Pragersko-Hodoš railway corridors are part of the core TEN-T network, and it is thus important to provide sufficient capacity and compliance with the TEN-T standards. Adequate multimodal suburban and city connections have to be provided to the cohesion centre of Maribor.
2b South-eastern Slovenia	The objective of the plan is to improve the connection of Bela Krajina (Črnomelj, Metlika) to Novo Mesto and Ljubljana. South-eastern Slovenia covers the Spodnjesavska statistical region and a part of the South-eastern Slovenia statistical region (Bela Krajina). The main problems are the accessibility of the Bela Krajina area to the regional centre of Novo Mesto and the motorway network (third development axis).
2c North-western Slovenia	The objective of the plan is to improve the connection of Bled and Bohinj to Ljubljana. North-western Slovenia encompasses the Gorenjska statistical region, where the area of Kranj and Škofja Loka is closely connected also with the capital city of Ljubljana. The main problem is the Ljubljana-Jesenice single-track railway line with poor throughput for goods transport, while passenger transport services also have to be improved. Problems also occur in the suburban connection of Škofja Loka to Ljubljana, the tourist centres of Bohinj, Bled, and Cerkno.
2d Goriška	The objective of the plan is to improve the connection of Bovec, Tolmin and Cerkno to Nova Gorica and Ljubljana. Goriška covers the Goriška statistical region, where accessibility from the Soča River valley to the regional centre Nova Gorica and Central Slovenia is the main problem (fourth development axis).

Objectives (general and specific)	Description
2e Koroška	The objective of the plan is to improve the connection of Koroška to Celje and Ljubljana. The greatest problem of Koroška is its poor accessibility to the motorway network due to the attained throughput on certain sections as one of its weaker characteristics (third development axis).
2f Primorska region	The objective of the plan is to improve the connection of Ilirska Bistrica (the border with Croatia) to Postojna and Ljubljana. In Primorska, the biggest problems are the throughput of the Koper-Ljubljana corridor for goods transport (in particular the existing railway lines) and the connections to tourist centres and the Croatian border.
2g Central Slovenia region	The objective of the plan is to improve the connection within Central Slovenia to Ljubljana. Central Slovenia extends beyond the statistical region, since it also includes Notranjska, the area of Kočevje (3A development axis), Zasavje and Spodnja Štajerska (Celje), where transport flows mainly gravitate towards Ljubljana. Accessibility to Ljubljana (the Ljubljana motorway ring, suburban and regional connections) and the low level of public transport services are regarded as major issues.
2h Accessibility within regions (to regional centres)	The objective is to increase (especially through general measures) accessibility to regional centres. According to the objectives of the spatial development of the Republic of Slovenia, everyone should have the option to reach one of the urban centres in Slovenia in 45 minutes by PPT or at least by passenger vehicle.
3 Improvement of accessibility of passengers to the main city agglomerations and within them	Ljubljana, Maribor and Koper are the main economic, political and administrative centres in the country. Thus, a better connection of all Slovenian regions to these three national centres (shorter travel time, level of services for public transport, better conditions of roads, where this is necessary) is to be ensured on the one hand; meanwhile, on the other hand, these are the centres of three important Slovenian regions and thus a proper connection also needs to be provided within them. In addition, Ljubljana is a hub of two TEN-T Pan-European corridors (northwest-southeast and southwest-northeast or east-west and north-south); Maribor is a hub in the comprehensive TEN-T EU network; whereas Koper is the location of the only Slovenian port and an important logistics centre or the origin of goods for Slovenia and central Europe.
3a Ljubljana	The smooth flow of transit rail and road transport needs to be ensured in a manner which reduces negative impacts on the environment to the minimum. Multimodal accessibility to the point of international, interurban and suburban passenger and goods transport with a focus on sustainable development must also be improved. A sustainable city transport system has to be developed. A system of transfer points must be established to provide a convenient and quick transfer between different means of transport. The central transfer point will be a passenger terminal which will act as a meeting point of international, intercity, suburban and city transport and where the transfer between all means of transport will be provided. A logistics centre also has to be established to provide transshipment between rail and road transport and also the development of supplementary activities.
3b Maribor	The smooth flow of transit, especially rail transport has to be enabled. Multimodal accessibility to the point of international, interurban and suburban passenger and goods transport with a focus on sustainable development must also be improved. A sustainable city transport system and a system of transfer points must be established to provide convenient and quick transfers between different means of transport. A logistics centre has to be established to provide transshipment between rail and road transport and also the development of supplementary activities.
3c Koper	In the direction of the border with the Republic of Croatia the smooth flow of transit transport, which is problematic especially during the tourist season, needs to be provided. The rail connection of Koper to its hinterland must be significantly improved. A sustainable transport system which will also provide environmentally acceptable accessibility has to be ensured in the area of the coastal region and within the city. The further development of the port and logistics centre has to be ensured, whereby the transshipment between ship, railway and road transports is possible and the further development of supplementary activities will be provided.
4 Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability	One of the steps needed to improve the efficiency and sustainability of the transport system is the improvement of the organisational and operational structure. An inadequately organised and inadequately implemented and maintained transport system will not be successful, regardless of the amount of funding allocated for its development. A more sustainable system means not only better utilisation of financial means, but also a system which is safer and more energy-efficient, and has less impact on the environment and society.

Objectives (general and specific)	Description
4a Harmonisation of legislation, rules and standards with European requirements and best practice	To fully attain the objectives of the new policy of the Pan-European transport network, uniform requirements regarding infrastructure have to be laid down and clear standards established for the infrastructure of this network. This will also include the application of smart mobility systems such as the future air traffic management system (SESAR), the European Railway Traffic Management System (ERTMS) and railway information systems, systems of maritime control (SafeSeaNet) and vessel traffic management information systems (VTMIS), intelligent transport systems (ITS) and interoperable, interrelated solutions for future generations of management systems of multimodal transport and information systems (also for charging fees and user charges). More efficient, transparent and financially sustainable planning, management and implementation of public transport on the basis of the Public Service Contract pursuant to Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public services of rail and road passenger transport and repealing Council regulations (EEC) Nos 1191/69 and 1107/70 also falls under this aspect/vision. To release the capacities of private funding, legislation must also be improved and an innovative financial instrument introduced. The evaluation and approval of the projects have to be efficient and transparent to limit the time, costs and uncertainties.
4b Improvement of the organisational system structure and cooperation between respective stakeholders	Countries are still the most important entities competent to form and maintain transport infrastructure. However, other entities, including partners from the private sector, also play an important part in implementing the multimodal Pan-European transport network and related investments, including regional and local bodies, infrastructure operators, concessionaires or managers, contractors, operators, etc. of ports and airports, navigation air transport services, etc. Better quality and higher efficiency/performance will be attained by improving their mutual cooperation. Through better cooperation with the public, also the integration of society and development of a transport system meeting the needs of users will be improved and provided.
	The improvement of the organisational structure of transport system and reorganisation of the structure of respective stakeholders to optimise their capacities are necessary to enhance the sustainability and quality of transport systems.
	To improve the monitoring of maritime transport and strengthen maritime supervision, it is necessary to consolidate cooperation and the exchange of information between the bodies involved in operational maritime supervision. The implementation of measures to consolidate this cooperation and establish a common environment for the exchange of information (e.g. data on the locations of ships, data on goods, sensor data, maps and charts, meteorological and ocean data, etc.) will reduce the managerial and operational costs of maritime transport activity, while stakeholders will be equipped with more up-to-date and the best available information about conditions at sea. The improved harmonisation will enable the better exploitation of technical means and exchange of information and data between individual bodies and sectors, as well as internationally. Thus, the duplication of data collection will be avoided and the more efficient operation of competent authorities at sea provided.
4c Improving the operational system structure	The quality, accessibility and reliability of public transport services will gain in importance in the coming years, due to, inter alia, the ageing of the population and the need to stimulate public transport. The proper frequency, convenience, easy access, reliability of services and intermodal connectivity are the main characteristics of the quality of the service. The reliability of information about travel time and possible routes is equally important for the smooth door-to-door mobility of passengers and goods. Human resources are a key component of every high-quality transport system. It is also generally known that the deficiencies in work force and qualifications of workers will become a serious issue in transport in the future. On the other hand, the improvement of implementing measures and strategy with the more efficient application of transport and infrastructure using upgraded systems for managing transport and information systems (e.g. UTS, SESAR, ERTMS, SafeSeaNet) are the main objectives for ensuring the sustainability of the sector. Proper maintenance of the existing transport network, capacities and vehicle fleet is very important for the sustainability and quality of the transport system. In this regard, the priority objective is to establish a system for proper maintenance.
4d Improve the transport system safety	One of the main objectives of the plan is to improve the safety of the transport system/network by implementing measures in the entire network, such as checking/evaluating road traffic safety, ITS/TMS, traffic calming measures, measures to encourage the use of public transport, etc.
	A centre for the control and management of vessel transport (VTS centre) has to be established in the field of the maritime transport safety due to the currently outdated control system and unsatisfactory availability of radio communications. The grounds for establishing a VTS centre with adequate technical equipment and control service organisation are also supported by the requirements of Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC.

Objectives (general and specific)	Description
4e Reduce/mitigate environmental impacts	Preventing, reducing or mitigating impacts on the environment due to transport-related activities is one of the main objectives of the plan. The strategy is mainly aimed at reducing greenhouse gas emissions related to the transport (the transport sector is one of their main sources), and air pollution. This will be attained through a set of measures regarding habits related to mobility (modal shift to public transport and environmental-friendly transport modes, e.g. walking and cycling) and by improving vehicle technology (more efficient and green). Preventing, reducing and mitigating (potential) impacts on the environment are important for both existing and new infrastructure. The protection of natural and constructed environments and landscapes, the preservation of biotic diversity and ecosystem services, the protection of heritage and ensuring a healthy environment (reducing the number of people affected by transport impacts such as noise and emissions) are necessary conditions for developing a sustainable transport network.
4f Improve energy efficiency	Better and more energy-efficient habits in regard to mobility are among the priorities of the European guidelines and plan. To attain this objective, more efficient utilisation of the transport network has to be promoted, especially the use public transport and environment-friendly transport modes. Also, the use of modern, more efficient and greener vehicles has to be stimulated by taking into account the use of alternative fuels and providing efficient ways to deal with end-of-life vehicles.
4g Financial sustainability of the transport system	One of the priority tasks of the European Union is to increase the financial sustainability of the transport system and reduce the needs for subsidies, which account for a significant part of national budgets. Increased financial sustainability will be attained through measures regarding organisation and operation, i.e. with more efficient network management (attained by better planning – which will attract more users – and management, e.g. with a public service contract which would allow a possible offer of services in the future, whereby a shift to market economies would be possible). New financial instruments, e.g. the European Union incentive for project bonds, may provide financial support for public-private partnerships to a greater extent.

When numbering the measures, we followed the principle that the measures from 1 to 10 concern network elements, the measures from 11 to 30 concern the network and from 30 on are organisational measures.

Table 7.3:
Description of measures for attaining specific projected objectives – railways

fully harmonized
partially harmonized

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Railways		
Description of measure		
R.1	Koper–Ljubljana	The corridor connecting Koper and Ljubljana to Eastern Europe, is used mainly to transport goods. However, it also provides the possibility for international passenger transport at the section from Divača to Ljubljana. It is part of the Mediterranean (MED) and Baltic-Adriatic TEN-T corridor. To deal with the expected growth in needs for goods transport at the Port of Koper and similar economic growth, the capacity has to be increased. Koper is also the main Slovenian TEN-T port and one of the most important ports in the Adriatic Sea. In addition to the increase in capacities related to the importance of the rail connection for goods transport, the railway network will have to fulfil the following minimum technical criteria: axle load of 22.5 tonnes, train length of 740 metres, ERTMS and electrification. The basis for project speed is up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances will also be taken into consideration pursuant to TSI with regard to line functionality. R.39 measure must be taken into account when siting and designing.
R.2	Zidani Most–Dobova (HR)	The section is part of the TEN-T core network; it is intended for mixed transport. The TEN-T standards have to be provided on the corridor with a sufficient axle load, speed, electrification and capacity. An upgrade is required relating to the length of trains (740 m) and introduction of the ERTMS. The line should allow speeds up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality. Measure R.39 must be taken into account when siting and designing.
R.3	Ljubljana–Jesenice (AT)	The section is part of the comprehensive TEN-T network. It is important for goods and at least on 2/3 of the Ljubljana–Kranj section for passenger transport (daily commuters). It is important to increase the capacity of the line and upgrade the (quality) of service. The line should allow speeds up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality. The length of trains of 740 metres should be taken into account. The ERTMS system must be introduced. The Karavanke railway tunnel must be arranged according to the requirements of transport safety and throughput capacity. Measure R.39 must be taken into account when siting and designing.
R.4	Ljubljansko železniško vozlišče (LŽV)	It is a crossroads of international transport corridors and the most important transport hub in Slovenia The enhancement of capacities is necessary for the provision of throughput of trade flows and to improve public passenger transport services. In addition to the re-arrangement (reorganisation) of the existing hub, extensions and the construction of missing tracks (e.g. the Tivoli Arc), and a bypass for goods transport will be necessary, so that it no longer runs through the main railway station. The Ljubljana passenger station is arranged. The ERTMS system must be introduced. Measure R.39 must be taken into account when siting and designing.
R.5	Ljubljana–Zidani Most	The section is in the Baltic-Adriatic (BA) and MED corridor and is part of the TEN-T network. It is intended for mixed transport. The TEN-T standards for the core network have to be provided on the section, with sufficient axle load and capacity. The line is also electrified; the upgrade is necessary to achieve higher speeds, namely up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality. A train length of 740 metres must be taken into account and ERTMS must be introduced. R.39 must be taken into account when siting and designing.
R.6	Divača–Sežana (IT)	The section is in the Baltic-Adriatic (BA) and MED corridor and is part of the TEN-T network. It is intended for mixed transport. The TEN-T standards for the core network have to be provided on the section, with sufficient axle load and capacity. The line is also electrified; the upgrade is necessary to achieve higher speeds, namely up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality. A train length of 740 metres must be taken into account and ERTMS must be introduced. Measure R.39 must be taken into account when siting and designing.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
R.7	Pragersko–Hodoš (HU)	The section is part of the MED corridor and the TEN-T core network; the Murska-Sobota-Hodoš section is in particular intended for goods transport and partly also for mixed transport; the line complies with the TEN-T standards (or it will comply after the completion of the current investment). Its capacity is currently sufficient (although it is a single-track line). The possible construction of an additional second track depends on Hungary's plans or the enhancement of transport flows. The ERTMS system must be introduced. R.39 must be taken into account when siting and designing.
R.8	Maribor–Šentilj (AT)	The section is part of the BA corridor and the TEN-T core network; it is intended for mixed transport. This is a single-track line on which capacities must be increased (also by constructing a second track) and which requires an upgrade in order to achieve TEN-T standards (mainly: axle load 22.5 t, speed up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality). Trains 740 metres long must be provided for and ERTMS must be introduced. Measure R.39 must be taken into account when siting and designing.
R.9	Pragersko–Maribor	The section is part of the BA corridor and the TEN-T core network; it is intended for mixed transport. The line capacity suffices; its upgrade is necessary to meet the TEN-T standards (mainly: axle load 22.5 t, speed up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality; Trains 740 metres long must be provided for and ERTMS must be introduced.). Measure R.39 must be taken into account when siting and designing.
R.10	Zidani Most–Pragersko	The section is part of the BA and MED corridor and the TEN-T core network; it is intended for mixed transport. The line capacity suffices; however, its upgrade is necessary to meet the TEN-T standards (mainly: axle load 22.5 t, speed up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality; trains 740 metres long must be provided for and ERTMS must be introduced). Measure R.39 must be taken into account when siting and designing.
R.11	Postojna–Ilirska Bistrica–Šapjane (HR)	The section is a part of the comprehensive TEN-T network and has important capacities, in particular for goods transport. The line capacity has to be improved and upgraded to a higher level of service, i.e. increased speed and frequency or passenger transport rides and adequate throughput and goods transport capacity. The line should allow speeds up to 160 km/h for passenger transport and up to 100 km/h for goods transport, whereby possible tolerances must also be taken into consideration pursuant to TSI with regard to line functionality. Trains 740 metres long must be provided for and ERTMS must be introduced. Measure R.39 must be taken into account when siting and designing.
Railway network		
R.21	ETCS	The installation of the ETCS system on tracks which are not described in the previous measures would enable an increase of the interoperability of the entire network. The ETCS installation on other lines of the Slovenian network (fully and not only on parts of the TEN-T network) is also reasonable. Further studies will determine specific needs and technical parameters for each case (e.g. ETCS second level on main and regional lines – ETCS Regional). Measure R.39 must be taken into account when siting and designing.
R.22	Electrification	The electrification of regional railway lines would increase the efficiency of the existing infrastructure. Further studies will determine specific needs and technical parameters for each case. Measure R.39 must be taken into account when siting and designing.
R.23	Renovation or new construction of other lines	The studies of individual sections will determine the need for renovation and upgrading of lines which were not included in the specific measures, whereby the concept of operations and economic and environmental aspects will also be observed (regional lines and lines to neighbouring countries which are not included in the TEN-T network). Measure R.39 must be taken into account when siting and designing.
R.24	Safety	The elimination of dangerous level crossings: the relevant legislation must be changed for this purpose, and we would have to redetermine which types of level crossings may be defined as suitably or unsuitably secured and thus dangerous. Then, on the basis of this, a schedule has to be prepared for the elimination of improperly protected railway crossings. Measure R.39 must be taken into account when siting and designing.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Functioning/organisation of the railway		
R.31	The reorganisation of the user charges for railway lines	Railway user charges have to be proportional to emissions, and therefore in accordance with the 'polluter pays' principle. They must be the same as marginal costs incurred directly by the provision of railway transport service; the system for calculating user charges must be changed by introducing an adequate incentive to equip trains with ETCS. The harmonisation of railway user charges with the railway administrations of neighbouring countries will facilitate international transport.
R.32	Multi-annual contract on the implementation of public services	The contract/contracts for the implementation of public service pursuant to Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public services of railway and road passenger transport and repealing Council regulations (EEC) Nos 1191/69 and 1107/70 are basic tools for providing transparency and efficiency in performing public transport services. Therefore, the expanded realisation of contracts on the implementation of public service is not only necessary for the purposes of harmonisation, but also as the first step to improving the sustainability of the Slovenian transport system. The typology and duration of contracts on the implementation of public service have to be determined by the analysis of individual cases together with the applicability of its own model (which could be based on the issues of full conformity or on applicability after a thorough evaluation of technical and financial requirements).
R.33	Increase in financial sustainability	An increase in financial sustainability is one of the objectives of the Pan-European transport system. In order to achieve this objective, the organisational structure of the railway system has to be optimised and the efficiency of functioning and maintenance has to be increased. The financial sustainability of the railway transport system should reduce the dependence of the system on public subsidies. Further studies will assess the individual measures needed to optimise the ratio between costs and income.
R.34	Improvement of the railway passenger vehicle fleet	To increase the competitiveness of rail transport over other transport modes, it is necessary to modernise the railway fleet in accordance with the foreseen improvements in the infrastructure. The first step in the development of this measure is a comprehensive analysis of the current organisation, operation and maintenance structures of the railway operator and thus the future requirements and operation and maintenance plan. After establishing the actual needs, the specific technical requirements regarding the rolling stock will be defined on the basis of further studies.
R.35	Modernisation of goods rolling stock	Goods rolling stock consists mainly of standard close and open carriages, with some of them suitable for combined transport. The first step in the development of this measure is a comprehensive analysis of the current organisation, operation and maintenance structures of the railway operator and thus the future requirements and operation and maintenance plan. After establishing the actual needs, the specific technical requirements regarding the rolling stock will be defined on the basis of further studies.
R.36	Modernisation of legislation and planning guidelines	The legislation and planning guidelines related to the railway have to stimulate the development of the sector and should be pursuant to the best international practice and European regulations, especially those related to safety, interoperability, transport sustainability and environment.
R.37	Development of the concept for maintaining the railway network	The Republic of Slovenia has a widespread road as well as railway infrastructure and other infrastructures. The infrastructure enables the mobility of the population and implementation of commercial activities. In recent years, the operators introduced various measurements of the situation which are used to establish the actual state of infrastructure quality. A computer-based system was introduced on some segments, providing continuous monitoring of the state and preparation of renovation plans on the basis of mathematical models. Such systems enable efficient infrastructure management and the long-term financial sustainability of the system. Systems based on real data on the state of the infrastructure enable more suitable planning of necessary financial resources in the long term. After these bases are established, multi-annual contracts for maintaining railway infrastructure will also be signed.
R.38	Reorganisation of operations/timetables	To increase the share of rail transport, it is necessary to reorganise the timetable (clock-face timetable) to improve the interrelation and efficiency of services. This possibility will be analysed in further studies while observing passenger potential and operational and infrastructural demands.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
R.39	Measures to prevent, mitigate and maximise the elimination of the consequences of significant impacts of the plan on the environment, nature, health and cultural heritage (mitigation measures)	Measures to protect the environment against noise caused by rail transport in particular include measures to reduce the noise at source (upgrade of rolling stock and railway infrastructure), measures to prevent the spread of noise into the environment (standard and low-noise barriers) and measures on buildings (anti-noise renovation of façade elements). More detailed measures must be defined in the operational programme for protection against noise, which must include all important railway lines and the railway network on both sides of settlement areas (Municipality of Ljubljana and Municipality of Maribor). The reduction of noise must also be taken into account in implementing measures R.34 and R.35 (modernisation and technical measures on rolling stock). In terms of reducing degradation of the natural environment, the reconstruction of existing infrastructure connections has priority over the construction of new traffic routes, and also the positioning of transport infrastructure in the existing infrastructural corridor has priority over positioning in naturally preserved areas. Therefore, sustainable land management and soil protection must be ensured when planning the integration of transport infrastructure in the environment. Activities in agricultural land and woodland must be reduced to the lowest level possible, and the planning of activities on land with poorer productive potential, and land outside dense forest areas and forest areas with important wood production functions at the first level must be given top priority. Railway infrastructure should not be integrated into coastal land. Such interventions may cause significant impacts on the ecological status of watercourses, a reduction in retention surfaces, including cumulative impacts on the biodiversity and ecosystem services of the area. When planning railway infrastructure in areas with extremely high, very high and highly vulnerable aquifers, it is necessary to study and plan appropriate technical solutions that prevent negative impacts of construction and operation, as well as extraordinary events. In the spatial integration of transport infrastructure, it is necessary to avoid water protection areas and areas at risk of flood and related erosion. Infrastructure corridors should not be integrated into cultural heritage areas, exceptional landscapes or landscapes with distinctive features at the national level. The proper technical measures must be applied to provide a high-quality landscape image by taking into account the natural and cultural features and topography of the area. When siting railway infrastructure in the area, it is necessary to avoid placing facilities in areas with nature conservation status (Natura 2000 areas, protected areas, ecologically important areas, areas proposed for protection). The time when interventions occur has to be adjusted to the life cycles of animals and plants. If the electrification of a railway line is planned in the area of flight and migration routes of birds, appropriate technical solutions for preventing the collisions of birds with power lines must be anticipated. Variants with less impact on the migration paths of wild animals should be given priority (those with long sections in tunnels, covered burrows; those which cross fewer migration paths). When fragmenting migration paths, adequate passages must be provided pursuant to good practices in the European Union. Chapter 9 of this document also states specific mitigation measures according to individual areas which must be taken into account in the preparation of spatial plans and designing of railway infrastructure.
R.40	Development of network into intermodal hubs, agglomerations in accordance with demand	The new TEN-T Regulation lists the following transport hubs in Slovenia: Ljubljana and Koper as hubs in the core section of the TEN-T network, and Maribor as the hub in the comprehensive section of the TEN-T network. These points have the best possibilities for the development of logistics activities relating to cargo, and Ljubljana and Maribor have the potential for establishing multimodal passenger platforms However, a wider (greater scope) approach to goods transport and the transition of passengers from one transport mode to the other could be provided in Slovenia. This would enable more efficient combinations of different means of transport in a transport chain and thus increase transport efficiency, in particular in areas where environmental issues are dealt with.. For this purpose, it is necessary to define possible points of passenger and goods transition between various transport modes in the future. Where necessary and efficient, intermodal passenger platforms should be established to increase the use of public passenger transport and the proper connection of logistics freight terminals with various modes of transport should be provided where a commercial interest exists.
R.41	Recycling and use of waste in construction	Stimulating recycling and the use of own waste in the construction and reconstruction of transport infrastructure and also the use of certified construction materials from recycled by-products or waste material from other sectors (Decree on Green Public Procurement is used). When using building materials for transport infrastructure which are not of primary natural origin, it should be taken into account that it is the use of larger amounts, especially for construction fillings, and that some hazardous substances from waste materials are permanently mobilised. New building materials may have better functional qualities than materials of natural origin.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
R.42	Preparedness for extreme weather conditions	Pursuant to Article 41 of Regulation (EU) No. 1315/2013 with regard to adaptation to climate change: with detailed documents, the preparation of an analysis of the sensitivity of transport infrastructure to climate change should be provided, and on the basis of the findings of the analysis, the measures and adaptations that adequately improve the resistance of infrastructure to these changes must be implemented. Guidelines, methodologies and procedures for collecting information on extreme weather conditions and for planning and implementing the measures to reduce the sensitivity of transport infrastructure to these phenomena have to be developed.
R.43	Provision of migration corridors for wild animals and protection of drivers against collisions with wild animals	Provision of migration corridors for wild animals and protection of drivers against collisions with wild animals: when constructing the projected railway lines, the existing migration corridors for wild animals have to be preserved by constructing proper structures of other arrangements to cross the facilities (especially for large mammals and bats). For the needs of planning, the purpose study was prepared already in the first phase (or the results of already conducted studies, if available, are summarised) which includes data on species the migration of which will be affected by the intervention, and guidelines for the project designer on planning the facility or arrangement (location, shape, size, greening of the facility and surroundings, etc.).
R.44	More accessible infrastructure for less mobile persons	The proper accessibility of infrastructure must be provided for all users. It must be adapted to be more accessible for less mobile persons, e.g. arrangement of proper access from platforms.

Table 7.4:
Description of measures for attaining the specific projected objectives – roads

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Road transport		
Road network elements		
Ro.1	Draženci – Gruškovje (HR) motorway	The section is a part of the comprehensive TEN-T network. Several years ago, the motorway section was constructed between Slivnica pri Mariboru and Draženci near Ptuj. The conditions of the current road network in 2030 were analysed, i.e. during the afternoon rush hour on an average working day and in a tourist peak period. It was established that the throughput will be exceeded in 2030. This is mainly an issue of increased traffic in the tourist season, since transport between Ptuj and the Slovenian-Croatian border takes place on a two-lane main road. Major congestion occurs at that time, which imposes an additional burden on the environment. The measure includes the construction of new motorway, since it is the only motorway section lacking between Maribor and Zagreb (13 km in length) which still to be built. Measure R.33 must be taken into account when siting and designing.
Ro.2	Completion of the Karavanke motorway tunnel	The section is a part of the comprehensive TEN-T network and is now constructed as a half motorway, causing poorer transport flow. In the current arrangement, the throughput during increased traffic volume with congestions is problematic. Jams a few kilometres long occur on certain days. For safety reasons, access for haulage vehicles is limited, or access to the tunnel is controlled. Traffic volumes are also growing annually, thus additionally increasing the extent and number of days with congestion, which is problematic for users (congestion, environmental burdening) and the tunnel manager (provision of safety). No other alternative exists to a single-tube tunnel than to construct an additional tube and renovate the existing one (the first tunnel tube), which will provide a full profile four-lane road. This will also improve traffic safety, which will fulfil the requirements of the directive on safety in tunnels (Directive of the European Parliament and of the Council, No 2004/54/EC of 29 April 2004 on minimum safety requirements for tunnels in the Pan-European road network). Measure R.33 must be taken into account when siting and designing.
Ro.3	Development of the concept of rest/parking areas on the motorway network and arrangement of areas on former international border crossings	In Article 19, the TEN-T Regulation defines the priorities of Member States with regard to the development of road infrastructure. It also foresees the provision of adequate parking areas for commercial users and thus certain levels of safety and protection. Information support should be provided with regard to the number of available and free parking spaces in car parks and for better use of existing car parks (ITS). By expanding existing car parks or the construction of new ones, if necessary, additional capacity must also be provided. The result of the accession of the Republic of Slovenia to the EU and the adoption of the Schengen regime on its borders is that border posts have to be rearranged or other functions have to be allocated to them. Within the scope of the measure, it is necessary to prepare an examination and analysis of border points, establish their needs, define their new, changed function and prepare reorganisation projects for these areas. Measure R.33 must be taken into account when siting and designing.
Ro.4	Connecting Bela Krajina with Novo Mesto	Bela Krajina has poor connections with regional centres, or their access is poor due to low speeds and weather conditions. With better accessibility, the possibility of future development and adequate connection of regions in terms of the economy and society will be provided. Accessibility through Gorjanci must be improved in this area in winter conditions. The proper standard of accessibility to centres of regional importance as well as to core centres and the core or comprehensive transport network has to be provided. The measure foresees the preparation of a project which includes the actual needs of the transport system. It is foreseen that the existing transport infrastructure will be used and reconstructed or upgraded to the greatest extent possible. Only in certain cases or locations where a suitable standard cannot be provided on the existing infrastructure it is possible to prepare a project outside it. Measure R.33 must be taken into account when siting and designing.
Ro.5	Novo Mesto city Network	The situation on the current 2030 road network during afternoon rush hours on an average working day was analysed. Traffic congestion and jams occur on certain sections of the network, and thus related excessive emissions in the residential environment. The prevention, reduction or mitigation of environmental impacts, particularly in residential environments due to activities related to traffic are among the main strategic objectives. The measure anticipates the construction of a bypass to create suitable throughput capacity for long-distance and origin-destination traffic in the city. The measure also improves conditions in the residential environment. Measure R.33 must be taken into account when siting and designing.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Ro.6	Connection of Bohinj and Bled to Ljubljana	The situation on the current 2030 road network during afternoon rush hours on an average working day was analysed. Traffic congestion and jams particularly between the motorway and Bled. This is especially true during the tourist season or rush hours at weekends. The measure foresees the reconstruction of the existing road, which will provide the proper conditions for traffic flow for long-distance transport and for source-target city traffic, and the construction of the southern Bled by-pass. The measures also improve conditions in the residential and natural environment. The possibility of improving accessibility to public passenger transport (existing rail connection, alternative modes of transport, ITS, etc.) must be studied. Measure R.33 must be taken into account when siting and designing.
Ro.7	Connection of Predel, Bovec, Tolmin and Cerkno to Ljubljana	Some areas of Goriška have poor connections with regional centres, or their access is poor due to low speeds and weather conditions. Thus, better possibilities for future development and the adequate economic and social connection of regions will be provided. The road over Vršič in winter is also a problem, and should be addressed. The proper standard of accessibility has to be provided to centres of regional importance as well as to core centres and the core or comprehensive transport network. The measure foresees the preparation of a project which includes the actual needs of the transport system. It is foreseen that the existing transport infrastructure is applied and reconstructed or upgraded to the greatest extent possible. This mainly refers to interventions in the infrastructure. Only in certain cases or at locations where a suitable standard cannot be provided on the existing infrastructure are the possibilities of preparing the project outside them studied. Measure R.33 must be taken into account when siting and designing.
Ro.8	Škofja Loka city network	The situation on the current 2030 road network during afternoon rush hours on an average working day was analysed. Traffic congestion and jams occur on certain sections of the network, and thus related excessive emissions in the residential environment. The prevention, reduction or mitigation of environmental impacts, particularly in residential environments due to activities related to traffic are among the main strategic objectives. The measure anticipates the construction of a bypass to create suitable throughput capacity for long-distance and origin-destination traffic in the city. The measure also improves conditions in the residential environment. Measure R.33 must be taken into account when siting and designing.
Ro.9	Connection of Koroška to the motorway system	Certain areas of Koroška must be provided suitable accessibility, safety and adequate level of transport connections to the centres of regional importance and to core centres and core or comprehensive transport network (to the motorways). Thus, better possibilities for future development and the adequate economic and social connection of regions will be provided. The existing transport infrastructure has been modernised or upgraded to the greatest extent possible. This mainly refers to interventions in the infrastructure. Only in certain cases or at locations where a suitable standard cannot be provided are the possibilities of implementing interventions outside the existing infrastructure studied. Measure R.33 must be taken into account when siting and designing.
Ro.10	Connecting Hrastnik with Zidani Most and Brežice	Individual areas of Slovenia have poorer connections to regional centres, or their accessibility is difficult due to low travel speeds. In this section, the main road has only one lane, thus enabling alternating traffic in one direction. A proper standard of accessibility (two-lane main road) has to be provided to centres of regional importance as well as to core centres and the core or comprehensive transport network. At the same time, a proper connection past Krško to Brežice has to be established. Measure R.33 must be taken into account when siting and designing.
Ro.11	Connecting Kočevje with Ljubljana	Individual areas of Slovenia have poorer connections to regional centres, or their accessibility is difficult due to low travel speeds. A proper standard of accessibility (two-lane main road) has to be provided to centres of regional importance as well as to core centres and the core or comprehensive transport network. The measure foresees the preparation of a project which includes the actual needs of the transport system. It is foreseen that the existing transport infrastructure will be used and reconstructed or upgraded to the greatest extent possible. This mainly refers to interventions in the infrastructure. Only in certain cases or at locations where a suitable standard cannot be provided on the existing infrastructure are the possibilities of preparing the project outside them studied. In addition to road infrastructure, there is also rail infrastructure in the direction of Kočevje. When preparing the measure, both modes of transport have to be taken into account. What specific measures can meet the objectives of faster and better accessibility also has to be established. In particular, whether upgrading the rail infrastructure would fully meet the foregoing objectives has to be studied, or if the final proposals for measures should be sought in the road and rail infrastructure by taking into account the more efficient implementation of public transport. Measure R.33 must be taken into account when siting and designing.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Ro.12	Ljubljana motorway ring and motorway connecting roads and their rearrangement	The situation on the current 2030 road network during afternoon rush hours on an average working day was analysed. Congestion occurs on almost all sections of the Ljubljana motorway ring. Planned measures: • introduction of public transport in which railway assumes a more significant role in the main directions or in the direction of regions. It can be expected that some traffic will decrease; nevertheless, an increase in traffic can be expected up to e.g. 2030 due to an increase in mobility; • introduction of the ITS system; • if these measures do not fully eliminate problems, measures should also be implemented to increase the capacity of existing motorway sections and connecting motorway roads, e.g. by expanding the existing motorway with another driving lane in each direction; • rearrangement and new construction of connecting motorway roads, e.g. Brezovica, Šmarje - Sap, Domžale, Vrhnika; • the possibility of implementing the project by means of private-public partnership should also be studied. Measure R.33 must be taken into account when siting and designing.
Ro.13	Connection of Gorenjska, Ljubljana and Štajerska	The connection between Gorenjska and Štajerska is provided by the Ljubljana motorway ring. Thus, a great part of transport between the regions runs on a longer route, incurring additional costs to users. Traffic burdens the Ljubljana motorway ring and the environment with emissions. The solution is in tangential connections: the new construction of a direct connection between Gorenjska and Štajerksa (Želodnik–Vodice) which will shorten the route between both regions; a new road between Trzin and the planned Študa connecting motorway road, which will relieve the existing Trzin radial road and Trzin and Domžale road network; the construction of the Stanežiče–Brod–Ježica–Šentjakob connection which will relieve the Ljubljana city road network. Measure R.33 must be taken into account when siting and designing.
Ro.14	Connection between Štajerska and Dolenjska	The connection between Štajerska and Dolenjska runs past Ljubljana via the motorway. As a result, a large volume of the traffic between Štajerska and Dolenjska runs on a longer route, which incurs costs to users. Traffic also burdens the Ljubljana motorway ring and the environment with emissions. The existing roads between Celje and Novo Mesto do not provide a proper connection standard. A direct connection between Celje and Novo Mesto will shorten the route between the regions. The possibility of using the existing infrastructure, which must be upgraded for speeds up to 90 km/h, must be studied. Where this is not possible, a new road should be constructed. Measure R.33 must be taken into account when siting and designing.
Ro.15	Connection of Škofja Loka/Medvode to Ljubljana	Škofja Loka and Medvode are considerable traffic generators, especially in terms of daily commuters. Daily burdening of traffic from these directions is particularly pronounced during morning and afternoon rush hours. Traffic jams occur on the road between Ljubljana and Medvode, which increases expenses for users and additionally burden the environment. Planned measures: • some daily transport flows have to be redirected to other transport modes, in particular to public passenger transport, whereby it is necessary to study which organisational solutions (bus transport, railway transport) can meet current and expected needs; • upgrade or completion of the existing road infrastructure; • where a suitable standard cannot be provided on the existing infrastructure, the possibilities of preparing the project outside it are studied. Measure R.33 must be taken into account when siting and designing.
Ro.16	Road network around Maribor	The situation on the current 2030 road network during afternoon rush hours on the average working day was analysed. The main problem is the traffic in the southern part of Maribor, namely in the direction from the western part of Maribor and its hinterland towards the expressway and motorway. Traffic jams occur on certain sections of the network due to traffic congestion, and thus related excessive emissions in the residential environment. The prevention, reduction or mitigation of environmental impacts, particularly in residential environments due to activities related to traffic are among the main strategic objectives. The measure anticipates the construction of a bypass to create suitable throughput capacity for long-distance and origin-destination traffic in the city. The measure also improves conditions in the residential environment. Measure R.33 must be taken into account when siting and designing.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Ro.17	Road network around Koper, connection of the Koper–Izola–Piran conurbation to the motorway system	The situation on the current 2030 road network was analysed, i.e. during the afternoon rush hour on an average working day and in a tourist peak period. Traffic congestion and jams occur on certain sections of the network (in the Koper direction, Dragonja border crossing), and thus related excessive emissions in the residential environment. The prevention, reduction or mitigation of environmental impacts, particularly in residential environments due to activities related to traffic are among the main strategic objectives. The measure anticipates the construction of a bypass to create suitable throughput capacity for long-distance and origin-destination traffic in the city. The measure also improves conditions in the residential environment. The situation on an average day on the existing road from Izola in the direction of Piran or Portorož is extremely poor in terms of transport technical and safety characteristics, while the daily volume of traffic exceeds the capacity of this road. Additional traffic in summer months and rush hours also affect the situation, causing major traffic jams. The measure foresees the construction of a new expressway from Jagodje to Lucija, which is the missing section of the so-called coastal road, the function of which is to connect the conurbation of Koper–Izola–Piran to the motorway system. Measure R.33 must be taken into account when siting and designing.
Ro.18	Connection of Ilirska Bistrica (HR) to the motorway system	The section from Postojna/Divača to Croatia is part of the TEN-T comprehensive network, and a missing section between Ljubljana/Trieste and Rijeka, as well as a missing part of the Adriatic–Ionian road connection. Ilirska Bistrica and its hinterland currently have a main road with no proper standard for a long-distance main road. Also, denser tourist traffic is recorded in the direction from Postojna towards Croatia (Rijeka, western part of Istria, Kvarner), which is especially heavy during the tourist season, when it reaches 3- to 4-times the average. During this period, traffic congestion occurs, which also present an additional environmental burden. The section from Postojna to Croatia is also a part of the TEN-T comprehensive network. Traffic analyses indicate that the road already in current conditions does not meet the proper standard, since it runs through the settlements, part of the road has no proper elements and also goods vehicle traffic is limited. The measure anticipates the modernisation of the existing infrastructure in order to ensure an appropriate standard and throughput of the existing road for speeds up to 90 km/h. The measure also foresees the study of relocating a section of the route that passes the areas of settlements in the form of by-passes, in particular to separate long-distance traffic from national transport and origin-destination traffic. Also, better traffic safety has to be ensured, so the solution also needs to include the separation of motorised from non-motorised traffic. Where a suitable standard cannot be provided on the existing infrastructure, the possibilities of preparing the project outside it are studied. Measure R.33 must be taken into account when siting and designing.
Ro.19	Celje road network	The situation on the current 2030 road network during afternoon rush hours on an average working day and in a tourist peak period was analysed. Traffic congestion and jams occur on some sections of the Celje network between connecting motorway roads and other network, and thus related excessive emissions in the residential environment. The prevention, reduction or mitigation of environmental impacts, particularly in residential environments due to activities related to traffic are among the main strategic objectives. The measure anticipates the construction of a bypass to create suitable throughput capacity for long-distance and origin-destination traffic in the city. The measure also improves conditions in the residential environment. Measure R.33 must be taken into account when siting and designing.
Ro.20	Connection of Ormož to Ptuj/Maribor	Individual areas of Slovenia have poorer connections to regional centres or their accessibility is difficult due to low travel speeds. Proper accessibility has to be provided to centres of regional importance, as well as to core or comprehensive transport network (motorways) The measure foresees the preparation of a project which includes the actual needs of the transport system. An adequate by-pass system is arranged in Ptuj, while the level of traffic situation has improved at the Ptuj-Ormož connection, namely by interventions in the existing transport infrastructure. Where a suitable standard cannot be provided on the existing infrastructure, the possibilities of preparing the project outside the existing transport infrastructure (partially or entirely) are studied. Measure R.33 must be taken into account when siting and designing.
Ro.21	Nova Gorica city Network	The situation on the current 2030 road network during afternoon rush hours on an average working day and in a tourist peak period was analysed. Traffic congestion and jams occur on some sections of the Nova Gorica network, and thus related excessive emissions in the residential environment. The prevention, reduction or mitigation of environmental impacts, particularly in residential environments due to activities related to traffic are among the main strategic objectives. The measure anticipates the construction of a bypass to create suitable throughput capacity for long-distance and origin-destination traffic in the city. The measure also improves conditions in the residential environment. Measure R.33 must be taken into account when siting and designing.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Ro.22	Connection of Kozjansko, Rogaška Slatina and the hinterland to the central network	Bizeljsko, Kozjansko, Šentjur and Rogaška Slatina have poorer connections to regional centres or their accessibility is difficult due to low travel speeds. A proper standard of accessibility has to be provided to centres of regional importance, as well as to core centres and the core or comprehensive TEN-T transport network. The measure anticipates the preparation of several projects which take account of the actual needs of the transport system. Interventions are particularly planned for the existing transport infrastructure. Only in certain cases or locations where a suitable standard cannot be provided on the existing infrastructure, is the possibility of preparing a project outside the existing transport infrastructure studied (e.g. Dramlje–Šentjur connection). R.33 measure must be taken into account when siting and designing.
Road network		
Ro.31	Improvement of the accessibility of regions without a direct connection to the TEN-T network	A regional network (road and railway network) which would enable people and economy to access regional centres (jobs, services of public importance) must be improved within a reasonable time. In addition to regional connections, the construction of bypasses is foreseen due to throughput issues caused by excessive environmental burdens and road traffic safety.
Ro.32	Traffic management, monitoring and counting, and information system	Traffic management is an important element of a traffic system. Traffic data collection and processing is a basis for complementing the traffic database. Traffic counting is done in various ways, whereby access to data at the proper platforms, which are also publicly accessible, needs to be ensured. The functions of traffic control, management and operation form a basis for improving traffic flow capacities. Efficient systems enable management which minimises congestions during regular traffic flow and during exceptional traffic events. The national transport model was developed within the scope of the broader preparation of the transport system development documents in the Republic of Slovenia. The model has to be maintained and upgraded with new research studies (e.g. surveys of households, other research projects), so that it is constantly up to date is thus ensured.
Ro.33	Measures to prevent, mitigate and maximise the elimination of the consequences of significant impacts of the plan on the environment, nature, people's health and cultural heritage (mitigation measures)	Measures to protect the environment from noise caused by road transport in particular include measures to reduce noise at source (low-nose road surface, temporary or permanent rerouting of transit transport and reducing speeds in noise-exposed areas) and measures on buildings (anti-noise renovation of façade elements). More detailed measures must be defined in the operational programme for protection from noise, which must include all important roads and the road network on both sides of the settlement areas (Municipality of Ljubljana and Municipality of Maribor). In preparing the respective programme, the focus must be on: a) reduction of noise caused by road infrastructure; detailed strategy and technological solutions to ensure efficient noise reduction due to tyre-road sound emissions must be prepared; b) preparation and observation of uniform positions to determine areas protected by noise barriers/embankments and the method of constructing them; and c) formation of uniform positions to prepare and implement measures on buildings. In terms of reducing the degradation of the natural environment, the reconstruction of existing infrastructure connections has priority over the construction of new traffic routes, and also the positioning of transport infrastructure in the existing infrastructural corridor has priority over positioning in naturally preserved areas. Therefore, sustainable land management and soil protection must be ensured when planning the integration of transport infrastructure in the environment. Activities in agricultural land and woodland must be reduced to the lowest level possible, and planned according to land with poorer production potential, and land outside dense forest areas and forest areas with important wood production functions at the first level must be given top priority. Transport infrastructure should not be integrated in the coastal land. Such interventions may cause significant impacts on the ecological status of watercourses and a reduction of retention surfaces, while cumulative impacts affect the biodiversity and ecosystem of the area. When planning interventions in areas with extremely high, very high and highly vulnerable aquifers, it is necessary to study and plan appropriate technical solutions that will prevent negative effects of the construction and operation, as well extraordinary events. In the spatial integration of transport infrastructure, it is necessary to avoid water protection areas and areas at risk of flood and related erosion. Infrastructure corridors should not be integrated in cultural heritage areas, exceptional landscapes or landscapes with distinctive features at the national level. The proper technical measures must be applied to provide a high-quality landscape image by taking into account the natural and cultural features and topography of the area.When siting transport infrastructure in the area, it is necessary to avoid areas with nature conservation status (Natura 2000 areas,

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
		protected areas, ecologically important areas, areas proposed for protection). The time when interventions occur has to be adjusted to the life cycles of animals and plants. Variants with less impact on the migration paths of wild animals should be given priority (those with long sections in tunnels, covered burrows; those which cross fewer migration paths). When fragmenting migration paths, adequate passages must be provided, pursuant to good practices in the European Union. On the basis of analyses of data on traffic accidents and on-site inspections, crossroads and sections with high rates of traffic accidents are determined. Measures to improve traffic safety must be implemented in these areas due to other impacts. For these, a programme of measures is prepared which determines the immediate possible measures; short-term, medium-term and permanent measures to improve traffic safety. Previous analyses indicated that many of the crossroads and sections in the Slovenian transport network must be rehabilitated. Measures to improve motorway safety also need to include safety measures which efficiently prevent wrong-way driving and which have to be carried out in the shortest time possible. Chapter 9 of this document also states specific mitigation measures according to individual areas which must be taken into account in the preparation of spatial plans and design of road infrastructure.
Ro.34	Development of network into intermodal hubs, agglomerations in accordance with demand	The new TEN-T Regulation lists the following transport hubs in Slovenia: Ljubljana and Koper as hubs in the core section of the TEN-T network and Maribor as the hub in the comprehensive section of the TEN-T network. These points have the best possibilities for the development of logistics activities relating to cargo, and Ljubljana and Maribor have the potential for establishing multimodal passenger platforms. However, a wider (greater scope) approach to goods transport and the transition of passengers from one transport mode to the other could also be provided in Slovenia. This will provide efficient combinations of various transport modes in the transport chain and thus increase transport efficiency. For this purpose, it is necessary to identify possible points of passenger and goods transition between various transport modes in the future. Where necessary and efficient, intermodal passenger platforms should be established to increase the use of public passenger transport, or a proper connection of logistics freight terminals with various modes of transport should be provided where a commercial interest exists.
Ro.35	Stimulation of the use of eco-friendly vehicles and construction of a charging stations network	Within the scope of EU institutions (the Council of Europe and the European Parliament), Directive No 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the employment of alternative fuels infrastructure was adopted. It stipulates that Member States must adopt national strategies for the respective field, namely relating to passenger vehicles for electric passenger vehicles, vehicles fuelled by compressed natural gas and hydrogen; relating to cargo vehicles for cargo vehicles fuelled by liquefied natural gas; relating to sea traffic for ships fuelled by liquefied natural gas and charging of ships with electric power from the land, and relating to aviation for charging aircraft with electric power at airports. The Directive also sets deadlines for this (mainly by 2025, except for electric vehicle charging stations, for which the deadline is 2020. In an annex, the Directive also lays down the standards for this infrastructure. Relating to environmental requirements at the national or EU level, the purchase of electric or hybrid vehicles will have to be promoted, and the network of charging stations has to be constructed, so that at least 15% of transport on Slovenian roads by 2030 is without GHG emissions. Financial incentives have to be projected which would encourage people to purchase the vehicles that run on environmentally-friendly fuels (e.g. electric power, gas).
Ro.36	Internalisation of external costs	This is a tool of transport policy based on European Directive 2011/76/EU of the European Parliament and of the Council of 27 September 2011 amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructure. The Directive lays down that EU Member States must introduce the charging of external costs at least for heavy goods vehicles over 11t (it could also introduce charges for other vehicles) if this measure is adopted. Congestion, air and noise pollution may be charged for additionally. This is the inclusion of environmental costs related to energy efficiency (quantity of CO2/km) and clean vehicles (EURO standard) in the fee price for the use of public roads and parking areas if they are located in city centres. The condition for this is the introduction of an electronic toll system in free traffic flow, or congestion charging.
Ro.37	Restrictive parking policy	Efficient measures to achieve objectives on the reduction of CO2 emissions and pollutants are: a) reducing the number of kilometres travelled by passenger vehicles in urban environments; b) increasing the share of pedestrian and bicycle traffic in the modal split; c) increasing the share of public passenger transport in the modal split; d) increasing the number of passengers in cars used in urban environments and reducing the use of fuel per cargo unit; e) improving the energy efficiency of vehicles; among measures to reduce the number of kilometres travelled by passenger vehicle, efficient restrictive parking policy measures in large cities include payable parking and limiting surfaces intended for parking passenger vehicles.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Functioning/organisation of road traffic		
Ro.41	Modernisation of legislation and planning guidelines	The legislation and planning guidelines on roads have to stimulate the development of the sector and should follow the best international practice and European regulations, in particular those related to safety, interoperability, sustainability and environment.
Ro.42	Improving the financial sustainability of the road network and toll collection system	Introduction of a stable earmarked source of financing and establishment of an electronic toll system in free traffic flow.
Ro.43	Provision of an adequate standard of the existing road infrastructure (including road reconstruction at the secondary and tertiary levels)	The Republic of Slovenia has widespread road, railway and other infrastructure, which enable mobility and economic activities. For this reason, operators must provide for their suitable quality. In recent years, operators have introduced various measurements which are used to establish the real state of infrastructure quality. Some segments, e.g. motorways, have implemented a computer-based system (e.g. dTIMS_CT or PMS_DARS) which enables continuous monitoring of the state of roads and the preparation of reconstruction plans on the basis of mathematical models based on road surface deterioration curves. Such systems provide efficient infrastructure management and long-financial sustainability. Systems based on real data on the state of infrastructure which enable the planning of necessary measures also have to be introduced in other segments of infrastructure (other roads, railway etc.).
Ro.44	Recycling and use of waste in construction	Stimulation of recycling and application of own waste in construction and reconstruction of transport infrastructure and also the application of certified construction materials from recycled by-products or waste material from other sectors (Decree on Green Public Procurement is used). When using building materials for transport infrastructure which are not of primary natural origin, their volume (in particular they are used as construction fillings) should be taken into account, and also that some hazardous substances from waste materials can be permanently mobilised. New construction materials have even better functional qualities than materials of natural origin.
Ro.45	Reduction of pollutant emissions	Reducing pollutant emissions by adopting the measure that the road vehicle fleet in public transport is regularly modernised and when purchasing new vehicles, providing that these are in compliance with the state of technology; the same attention as to the stimulation of the use of public transport in urban centres is paid also to other modes of sustainable mobility (cycling, pedestrian zones or low emission zones). When preparing spatial acts for new infrastructure activities or for the extension of the existing transport network, the following general guidelines must be observed in order to attain the objective of reducing ambient air pollution: – measures to reduce pollutant emissions (prevention of traffic congestion, provision of smooth traffic flow at moderate travel speeds between 60 and 90km/h, traffic rerouting) have to be provided to the greatest extent possible; – measures to prevent increased traffic flow on individual sections of the road network, and measures to prohibit the entry of motor vehicles (especially cargo vehicles) which do not meet environmental standards for new vehicles must be implemented in areas with excessive ambient air pollution; – the integration of measures in populated areas which are especially sensitive to ambient air pollution (residential buildings; health-care facilities, tourist areas) should be avoided.
Ro.46	Preparedness for extreme weather conditions	Pursuant to Article 41 of Regulation (EU) No. 1315/2013 with regard to adaptation to climate change: ensuring the preparation of the analysis of the sensitivity of transport infrastructure to climate change, and on the basis of the findings of the analysis, implementing measures and adaptations that adequately improve the resistance of infrastructure to these changes. Guidelines, methodologies and procedures for collecting information on extreme weather conditions and for planning and implementing measures to reduce the sensitivity of transport infrastructure to these phenomena have to be developed.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Ro.47	Provision of migration corridors for wild animals and protection of drivers against collisions with wild animals	The provision of migration corridors for wild animals and protection of drivers against collisions with wild animals: Reduction of the fragmentation of habitats of species by establishing passages for wild animals on existing traffic routes (especially for species from groups of mammals and amphibians). For this purpose, initially, a study is conducted or the findings of already conducted monitoring of roadkill are summarised. Then, based on the study findings, facilities for the migration of wild animals are established. Within the measure, a priority list of black spots where amphibians are run over is prepared, where facilities for migrations are arranged, including redirecting fences. To improve traffic safety (to prevent collisions with large mammals), the setting-up of chemical deterrent devices, sound devices, light reflectors and combined devices is possible on unfenced traffic routes, depending on location and traffic volumes. In newly-planned traffic routes, the preservation of existing migration paths with the construction of proper facilities and other arrangements preventing wild animals' movements (especially for species of wild animals, roe deer, red deer, bats and amphibious animals) has to be provided for. For the needs of planning, a purpose study is prepared already in the first phase (or the results of already conducted studies, if available, are summarised) which includes data on species the migration of which will be affected by the intervention, and guidelines for the project designer on planning the facility or arrangement (location, shape, size, greening of the facility and surroundings, etc.).
Ro.48	More accessible infrastructure for less mobile persons	The proper accessibility of infrastructure must be provided for all users. It must be adapted to be more accessible for less mobile persons, e.g. arrangement of proper access from pavements, application of disabled-friendly means of public transport; setting up public electric charging stations, adjusted to wheelchair use, etc.

Table 7.5:
Description of measures to attain the specific projected objectives – urban transport

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Urban traffic		
Elements of urban network		
U.1	Kamnik–Ljubljana corridor	It is one of more important radial roads to the capital city of Slovenia, with high traffic density, especially in the form of daily commuters. Public passenger transport is also quite extensive and could be improved, particularly relating to railways. This will be achieved through the increase of capacities and quality of passenger transport services. A double-track line (or at least a partial double-track line) has to be ensured for this purpose to enable a clock-face timetable and electrification. Measure U.40 must be taken into account when siting and designing.
U.2	Kranj–Ljubljana corridor	The section is an important Ljubljana radial road with a considerable number of rail passengers. Capacities are insufficient to transport all potential passengers. In order to improve this, a double-track line has to be ensured to enable a clock-face timetable, which will be provided with the construction of the second track on the Ljubljana–Jesenice line. Measure U.40 must be taken into account when siting and designing.
U.3	Southeast Ljubljana-Ljubljana corridor	It is one of more important radial roads to the capital city of Slovenia, with high traffic density, in particular in the form of daily commuters. Public passenger transport, in particular by rail, could also be improved with specific measures on this section. This will be achieved through the increase of capacities and quality of passenger transport services. A double-track line (or at least a partial double-track line) has to be ensured on the Ljubljana-Grosuplje section for this purpose to enable a clock-face timetable and electrification. Measure U.40 must be taken into account when siting and designing.
U.4	Connection of Ljubljana to the airport	Ljubljana Jože Pučnik Airport does not have the proper public passenger transport connections to the capital city of Ljubljana. Proper bus connections must be introduced (direct connections, not through surrounding areas, e.g. a direct connection between the airport and Ljubljana), and/ or combined vehicles on demand or a proper railway connection provided. Measure U.40 must be taken into account when siting and designing.
Urban network		
U.11	Ljubljana P+R (Park and Ride)	Ljubljana is the biggest Slovenian city and the capital, with the largest share of daily commuters, whose commute could be improved with a suitably located P+R system. The car parks are connected directly to public transport capacities, which enables users direct and environment-friendly access to the city centre. Users avoid a stressful drive through congested city streets, while the city is relieved of passenger vehicles and their negative consequences – from overcrowded streets and car parks to the pollution and general degradation of the city centre environment. 25 P+R locations are planned for Ljubljana. Measure U.40 must be taken into account when siting and designing.
U.12	Maribor P + R	Maribor is the second biggest Slovenian city, with a large share of daily commuters whose commute could be improved with a suitably located P+R system. The car parks are connected directly with public transport capacities, which enable users direct and environment-friendly access to the city centre. Users avoid a stressful drive through congested city streets, while the city is relieved of passenger vehicles and their negative consequences – from overcrowded streets and car parks to the pollution and general degradation of the city centre environment. 6 P+R locations are planned for Maribor. Measure U.40 must be taken into account when siting and designing.
U.13	Slovenija P + R	Slovenia is a very specific country in terms of population distribution. It has around 6,000 settlements; translated into area, this means 20,273 km2 and in terms of population number, approximately 2 million. The application of P+R (park and ride) seems a suitable way to promote the use of public passenger transport. It is a combination of parking lots and public transport stop facilities which enable the user to drive in their own his or another vehicle to more important points on the outskirts of the city or to main radial roads they enter the means of public transport or rent a bicycle. Potential points for constructing P+R were suggested by the traffic model, but a more detailed study will be necessary to plan their precise locations. 72 P+R locations are planned for Slovenia. Measure U.40 must be taken into account when siting and designing.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
U.14	Development of stations	From the viewpoint of sustainable mobility/integrated public transport plans, a suitable analysis of the existing situation and the expected development of the transport system and social and economic circumstances in city and regional areas will help identify the need for renovating/ upgrading existing stations and the construction of new ones where this is justified by mobility rates. On the other hand, this could also mean the closure or functional degradation of some existing stations, where expected levels of mobility become insufficient. The development of stations will focus mainly on improving accessibility for passengers, especially persons with reduced mobility, through which passenger safety will be ensured, along with the introduction of information systems and systems for public communication. Special attention must be paid to the arrangement of the currently inadequate Ljubljana passenger station. Measure U.40 must be taken into account when siting and designing.
U.15	Separation of transport types – giving priority to public transport, elimination of congestion	Public urban transport (buses and possibly a light railway) has to coexist with other transport modes, since the space in towns is always limited. More attention will be dedicated to public transport and the return of a section of urban space to use by residents. In this regard and due to the increased efficiency of public transport, the extent of separation of private and public transport will be increased by constructing driving lanes for public transport only (buses and possibly the light railway) and carrying out measures providing the right of way for public transport through traffic management elements such as traffic lights. Obstacles which prevent an efficient public transport flow, cause delays and may endanger the road safety (e.g. level crossings) will also be eliminated. Measure U.40 must be taken into account when siting and designing.
U.16	Increase of intermodality Bicycle network	One of the key aspects of establishing a good public passenger transport system is the level of success of integrated transport systems which promote the transition from private to public transport and between different public transport modes (e.g. between means of transport: car, bicycle, train, bus, combined vehicle, taxi, cableway, vessels). Thus, together with the development of proper intermodal terminals, the development of infrastructure, such as Park & Ride, Kiss & Ride (combination of delivery of passengers with passenger vehicles and public transport), Bike & Ride, etc. will give commuters an additional option for accessing a town, which will avoid traffic jams in the central urban areas and stimulate the use of public transport. The location of this infrastructure will be analysed in detail on a case-by-case basis, whereby functionality will be taken into account, e.g.: P+R is usually on the outskirts, in the vicinity of public transport stops. Measure U.40 must be taken into account when siting and designing.
U.17	Functioning/ organisation of urban traffic	It is necessary to prepare a plan for the organisation and classification of national and sub-urban cycling routes and related equipment. The priority tasks are as follows: the connection of already constructed cycling sections into larger, logically closed units, the provision of a higher standard or level of services for cyclists, additional reduction of the number of traffic accidents involving cyclists (the "zero" vision principle is applied abroad) and construction of local cycling connections which are linked to the national cycle network and provide cyclists with higher mobility. The final long-term plan period foreseen for the construction of the entire network is 25 years. The construction will be carried out in phases. The investment in the establishment of national cycle network has to be balanced according to the individual projected short-term, mid-term and long-term planning stages. Prudent planning of measures is necessary according to the financial and spatial possibilities and available road infrastructure. It is reasonable to use as many existing roads with low average annual daily traffic as possible, which have to be reorganised or equipped with traffic signalisation for the safe operation and management of cycle traffic. The construction of new cycling routes is foreseen only for locations where the cycling route standard so demands. The construction of cycling routes and cycling lanes is foreseen especially in settlements and where it is really necessary from the aspect of traffic safety. Measure U.40 must be taken into account when siting and designing.
Functioning/organisation of urban traffic		
U.31	Introduction of a uniform ticket	One of the most tangible benefits for users of integrated transport systems is the introduction of integrated tariff systems. The level of integration of the tariff system and type of tickets and technologies used (individual tickets and/or electronic tickets, smart cards or contactless payment etc.) will be analysed from case to case on the basis of the competence of the relevant transport body and by considering all options, such as the use of smart cards for the payment of P+R, street parking, tolls etc.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
U.32	Introduction of on-demand public transport services	One of the main objectives of the strategy for transport development is to increase the sustainability of the transport system and provide solutions for public transport which at the same time will be accessible to the majority. By taking into account that there is insufficient demand in some parts of Slovenia to justify the introduction of regular public transport lines (e.g. rural areas or areas of dispersed population), the introduction of public transport services on demand will make the option of public transport services available in the aforementioned areas.
U.33	Adjustment of timetables (harmonised)	To increase the share of public transport in urban, suburban and regional transport, timetables have to be harmonised to improve the connectivity, efficiency and coordination of various transport modes. Further studies will analyse this possibility by taking into account the number of passenger and operational and infrastructure requirements.
U.34	Administrative capacities and training	The introduction of integrated transport systems and new technologies together with the need to increase the financial sustainability and efficiency of transport systems leads to defining the lack of administrative capacities and suitably trained staff as one of the key questions in this sector and also one of the priorities of the EU cohesion policy. The use of additional administrative capacities is important in this sector, in particular in terms of creating new jobs for integrated transport systems and project preparation and control. The introduction of new technologies means that existing and new personnel have to be trained to operate and maintain these systems. Due to the close connection between urban, suburban and regional transport with zero emissions and users of passenger vehicles, training will be implemented in combination with educational programmes for users on the safe use of different means of transport. The training and educational programme also has to be developed inter alia: • to increase the capacities and qualification of administrative personnel; • to train the personnel of various carriers for a cost-efficient and safe driving and communication with passengers; • to train students in the field of use and safety of bicycles and public transport; • to raise public awareness on safe driving and efficient and safe use, as well as the advantages of public transport, with an emphasis on the vulnerable groups (e.g. the disabled and the elderly). The programme will be based on case studies and examples of good practice. In this way, it will provide a dynamic and permanent education.
U.35	Vehicle fleet modernisation	Apart for some exceptions, the current fleet of public transport vehicles is old and based on out-of-date and inefficient technologies. In order to increase the competitiveness of public transport in comparison with private vehicles, the vehicle fleet has to be modernised and comply with the highest quality standards and safety and environmental standards, including its accessibility to people with limited mobility. The modernisation of the vehicle fleet will be carried out together with the projected improvements of the infrastructure. The first steps in the development of this measure are a comprehensive analysis of the current organisation, operation and maintenance structures of the respective operators and the analysis of future requirements and operation and maintenance plan. After establishing the actual needs, the specific technical requirements regarding the vehicle fleet will be defined on the basis of further studies.
U.36	Information platform	Raising the awareness of the public on the efforts of administration and advantages of public transport is important for the successful implementation of other measures. Promotional campaigns will be organised to disseminate information about the adopted measures. These will include traditional public media, advertisements, public workshops and the establishment of special information platforms, which will also operate as public forums.
U.37	Support for non-profit groups in the field of transport	Non-profit groups promoting the use of alternatives to passenger vehicles proved very successful in numerous cities across Europe. There are also groups which encourage the everyday use of bicycles, groups which advocate the rights of passengers, maintenance of pedestrian zones or even traffic control. These groups (neighbourhoods or groups with joint interest, non-governmental organisations, etc.) can assist local administrations and bodies in their tasks and the implementation of the use of public transport. For this reason, the cooperation of such associations, local communities and non-governmental organisations have to be encouraged and taken into account in decisions related to transport planning.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
U.38	Transport and logistics management and related information	Among other things, new technologies also enable the collection of data and monitoring of traffic conditions and the use of public transport in real time. In order to utilise these new technologies, centres for centralised public transport management will be established, which will be equipped with the latest IT solutions. New public transport vehicles will be equipped accordingly; IT platforms will be used to plan routes; traffic signs will be updated so they are integrated into the centralised management system (e.g. 'smart traffic lights' or measures favouring public transport). In this way, the quality of planning and monitoring public transport, user information for passengers, traffic control and data collection on traffic jams, and arrivals of public transport vehicles in real time will rise.
U.39	Review/modernisation of local/regional central transport plans	Regarding commitments for transport planning, functional regions and/or towns will have to develop suitable plans for sustainable mobility in towns (mobility plans may cover the area of one town or several combined towns (functional regions)). These plans will facilitate an analysis of the current state of the traffic systems, not only from the infrastructural, but also from the operational and organisational aspect, while on the basis of the analysis, future needs will be defined. The existence of these plans is a precondition for investments in public transport systems. These mobility plans have to be examined and updated; they have to be in accordance with high-level planning documents, such as the transport development strategy. Purchasing new vehicles, ensuring that these are in compliance with the state of technology; the same attention as to encouraging the use of public transport in urban centres is also paid to other modes of sustainable mobility (cycling, pedestrian zones or low emission zones).
U.40	Measures to prevent, mitigate and maximally eliminate the consequences of significant impacts of the plan on the environment, nature, health and cultural heritage (mitigation measures).	When preparing spatial acts for new infrastructure activities or for the extension of the existing transport network, the following general guidelines must be observed in order to attain the objective of reducing ambient air pollution: • measures to reduce pollutant emissions (prevention of traffic congestion, provision of smooth traffic flow at moderate travel speeds between 60 and 90km/h, traffic rerouting) have to be provided to the greatest extent possible; • measures to prevent increased traffic flow on individual sections of the road network, and measures to prohibit the entry of motor vehicles (especially haulage vehicles) which do not meet environmental standards for new vehicles must be implemented in areas with excessive ambient air pollution; • the integration of measures in populated areas which are especially sensitive to ambient air pollution (residential buildings,health-care facilities, tourist areas) should be avoided. Measures to protect the environment from noise caused by city transport in particular include measures to reduce noise at source, measures to prevent the spread of noise into the environment and measures on buildings. Therefore, sustainable land management and soil protection must be ensured when integrating urban infrastructure into the environment. It is also necessary to avoid water protection areas and areas at risk of flood and related erosion and areas of cultural heritage and exceptional landscape. When siting, it is necessary to avoid areas with nature conservation status (Natura 2000 areas, protected areas, ecologically important areas, areas proposed for protection). When fragmenting migration paths, adequate passages must be provided following good practices in the European Union. Chapter 9 of this document also states specific mitigation measures according to individual areas which must be taken into account in the preparation of spatial plans and design of public urban transport.
U.41	Preparedness for extreme weather conditions	Pursuant to Article 41 of Regulation (EU) No. 1315/2013 with regard to adaptation to climate change: provide a preparation of an analysis of the sensitivity of transport infrastructure to climate change, and on the basis of the findings of the analysis, implement measures and adaptations that adequately improve the resistance of infrastructure to these changes. Guidelines, methodologies and procedures for collecting information on extreme weather conditions and for planning and implementing measures to reduce the sensitivity of transport infrastructure to these phenomena have to be developed.

Table 7.6:
Description of measures for attaining the projected specific objectives – water transport

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Water transport		
Elements of water network		
M.1	The Port of Koper – extension of piers	The Port of Koper's objective is to achieve transport growth of over 19 million tonnes by 2015 and over 23.5 million tonnes by 2020. In 2030, over 30 million tonnes of transshipment is expected. To attain these goals, piers 1 and 2 must be extended (among other things). Both measures are also defined in the adopted national spatial plan. Measure M.35 must be taken into account when siting and designing.
M.2	The Port of Koper – extension of piers	Construction of Pier 3 as a condition for transshipment to increase in the Port of Koper is foreseen after 2030. This measure is also defined in the national spatial plan. Measure M.35 must be taken into account when siting and designing.
M.3	Port of Koper – rearrangement of port infrastructure	According to measures M.1, M.2 and M.4, the port infrastructure needs to be rearranged, namely: expansion of rear terminals, depots and warehouses, expansion or extension of railway track capacities, loading stations, reservoirs, car parks, implementation of ecological rehabilitation for bulk material, additional road capacities, arrangement of external connections and entry to the port, and external freight terminal etc. Measure M.35 must be taken into account when siting and designing.
M.4	Port of Koper (area of concession and outside of it) – deepening	Vessels, especially container ships, are becoming larger and have larger draughts, which is why the deepening of entry channels and pools is constantly required. Thus, the deepening of the entry canal to Pool I and Pool I to a depth of 15m is projected in the Port of Koper by 2015, while by 2020 the entry canal to Pool II and Pool II to a depth of 16m is foreseen. Measure M.35 must be taken into account when siting and designing.
M.5	The Port of Koper – passenger terminal	Arrangement of infrastructure and construction of a passenger terminal facility. Measure M.35 must be taken into account when siting and designing.
M.6	The establishment of an international inland waterway along the Sava River between Brežice and Obrežje	Through cooperation in the appropriate European cross-border project, Slovenia and Croatia may construct a harmonised hydro-energy chain and at the same time establish the international navigability of the Sava River to Slovenia. For this purpose, Slovenia was to submit a request for a special comprehensive project prepared already during drafting of the Danube Strategy as a cross-border Krško–Zagreb pilot project. The Krško–Zagreb project includes a comprehensive approach to the arrangement of the Sava River for the needs of energy, navigation, flood protection, irrigation and tourism, while observing sustainable principles of environment protection and preservation of biotic features by introducing substitute natural habitats when this is necessary. Both countries could draw resources to implement this project with joint candidature at tenders of financial funds of the European cohesion and regional policies. Measure M.35 must be taken into account when siting and designing.
Water network		
M.11	Filling stations for alternative fuels	Regarding the proposal of the Directive on the employment of alternative fuels infrastructure, the core TEN-T ports (the Port of Koper being one of them) must be provided with the infrastructure for charging vessels with liquefied natural gas and electric charging from land by 2025.
M.12	Motorways of the sea and the development of short-distance maritime transport	Strengthening cooperation with stakeholders to establish a single window for organising motorways of the sea and short-time maritime transport. Cooperation on efforts to establish the free flow of goods by sea (blue belt).
M.13	Improving transport system	The establishment of the VTS centre (system for monitoring maritime transport) with proper technical equipment and organisation of control service

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Functioning/organisation of water-borne transport		
M.21	Development of network into intermodal hubs, agglomerations in accordance with demand	In addition to transshipment, logistics activity is carried out in the port. This is related to the (re)arrangement of port infrastructure, described in measure M3, which also serves for logistics activity. Furthermore, suitable end connections with the port (so-called last miles), i.e. road, rail and maritime connections, have to be ensured for the successful development of this area.
M.34	Administrative capacities and training	The provision of proper organisational and administrative capacities to carry out control, monitoring and information in maritime transport.
M.35	Measures to prevent, mitigate and maximise the elimination of consequences of significant impacts of the plan (mitigation measures)	The measures must be adopted to permanently reduce negative impacts on sea quality, bathing waters in the wider Koper and inland waters area, e.g. training of inspection services; purchase of proper equipment for spillages of dangerous substances into the sea; construction of proper infrastructure to receive and dispose of waste material from vessels; provision of the circulation of water currents and thus prevention of eutrophication through proper planning and construction of ports. Effects on the ecological status of water, water organisms, erosion and flood protection must be prevented when constructing ports and arranging the waterway network and navigation.
M.36	Determination of the navigation categories of inland waterways in Slovenia in regional categories (I-III) in areas of rivers and lakes with proper conditions	In addition to transshipment, logistics activity is carried out in the port. This is related to the (re)arrangement of port infrastructure, described in measure M3, which also serves for logistics activity. Furthermore, suitable end connections with the port (so-called last miles), i.e. road, rail and maritime connections, have to be ensured for the successful development of this area.
M.37	Provision of navigation safety on waterways by incorporating the EU IWW legislation and rules of the International Sava River Basin Commission into Slovenian legislation	By establishing an international waterway on the Sava, Slovenia will be linked to the Danube and the entire European network of inland waterways (TEN IWW), and will thus be obliged to include all European legislation on inland waterway transport and regulations of the Sava Commission on the navigation on the Sava River into its legal order as an EU Member State and signatory to the Framework Agreement on the Sava River Basin The safety of navigation on inland waterways regarding regional classifications (I-III) will also be arranged accordingly.

Table 7.7:
Description of measures to attain the projected specific objectives – air transport

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Air transport		
Air network elements		
A.1	Ljubljana Jože Pučnik Airport	Further development for the needs of transporting passengers, mail and/or goods. Thus, it is important to provide a proper air transport infrastructure, especially in terms of runway, construction of passenger and freight terminals, construction of additional plane parking positions, logistics complex, etc., on the basis of which greater financial effects and indirect effects on the tourism and economic development of the whole Slovenia will be achieved. The objective of developing Ljubljana Jože Pučnik Airport is to make it into a regional airport. The airport already has a master plan for its further development.
A.2	Maribor Edvard Rusjan Airport	The continuation of development for the needs of transport of passengers, mail and/or goods according to demand. The airport could be an alternative to Ljubljana Jože Pučnik Airport. The airport already has a master plan for its further development. When planning facilities within the airport: – Directive 2002/30/EC on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports must be taken into account. When drafting the project documentation, a groundwater risk assessment including suitable technical measures for groundwater protection must be prepared due to the possibility of affecting the highly vulnerable aquifer.
A.3	Ljubljana Jože Pučnik Airport	The continuation of development for the needs of transport of passengers, mail and/or goods and the provision of the proper infrastructure for regular airport operation, on the basis of which better financial effects and indirect effects on tourism and the economic development of the Primorska region could be achieved. When preparing spatial and project documentation to expand the airport, the following guidelines must be taken into account: 1. within the scope of extending the airport, only inventions which do not have a negative impact on the residential environment (noise) and development of tourism at the local level, and on the Sečovlje Salt Pans Landscape Park are allowed; 2. Directive 2002/30/EC on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports must be taken into account. Increased environment pollution is expected, mainly in the area of Portorož Airport, where an additional mitigation measure of purchasing and changing the intended use of buildings for which the excess of legally prescribed noise pollution was established is possible. The variant mitigation measure to reduce the impact of Portorož Airport on the increased level of noise pollution in the environment is the provision of multimodal transport connections to other airports in the wider vicinity (Ljubljana, Trieste, Rijeka, Pula) where the capacity of passenger and cargo transport is provided already in the existing state; 3. appropriate technical solutions must be planned to prevent negative impacts of the airport on the bathing waters of bathing areas in the wide area of Strunjan during construction and operation, as well as in cases of extraordinary events (e.g.: spillages of dangerous substances); 4. the use of land with lower productive potential must be given priority; 5. the protection guidelines for the Sečovlje Salt Pans cultural landscape; 6. the nature conservation guidelines must be taken into account: – the expansion of the airport is permissible if the number of airport operations is decreasing and the number of passengers is increasing; – in the protected area of the Sečovlje salt-pans have to be avoided to the greatest extent possible; – the negative impact on the characteristics of the Sečovlje salt-pan areas – on the basis of which the Ramsar locality, Natura 2000 and landscape park are defined – has to be prevented; – the airport will not be expanded into habitats which are important for preserving biodiversity in the area of the Sečovlje salt-pans.

Harmonisation with the Transport Development strategy/ Code	Measure	Description of measure
Air network		
A.10	Air navigation services	The implementation of air navigation services must provide safety, regularity and continuity of air traffic, the fulfilment of international obligations of the Republic of Slovenia relating to these services and also flights in search and rescue actions for humanitarian and medical purposes, emergency flights of aircraft and flights of state aircraft. Within this scope, constructions, reconstructions or building of infrastructure facilities, devices and systems of air transport navigation services are foreseen.
A.11	Air navigation services	The implementation of air navigation services must provide safety, regularity and continuity of air traffic, the fulfilment of international obligations of the Republic of Slovenia relating to these services and also flights in search and rescue actions for humanitarian and medical purposes, emergency flights of aircraft and flights of state aircraft. Within this scope, constructions, reconstructions or building of infrastructure facilities, devices and systems of air transport navigation services are foreseen.
Functioning/organisation of air transport		
A.21	Developing the network into intermodal hubs, agglomerations in accordance with demand	Ljubljana Jože Pučnik Airport and Maribor Edvard Rusjan Airport also have options to develop logistics activities if there is an economic interest. Both airports have the spatial options and proximity of motorway and railway connections (Maribor in particular) within the scope of the core TEN-T connections and corridors of the core network (BA and/or MED). Portorož Airport currently only operates the logistics platform for the transit of passengers from air to road or maritime transport to other tourist centres of Slovenian coast.

Table 7.8: Table of measures and their impact on specific objectives

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
	1a Elimination of congestion on borders	1b Improvement of the accessibility of international interurban passenger transport (including transit traffic)	1c Improving accessibility of goods transport (including transit transport	2a North-eastern Slovenia	2b South-eastern Slovenia	2c North-west Slovenia	2d Goriška region	2e Koroška region	2f Primorska region	2g Central Slovenia	2h Accessibility within regions (to regional centres)	3a Ljubljana	3b Maribor	3c Koper	4a Harmonisation of legislation, rules and standards with European requirements and best practice	4b IImprovement of the organisational system structure and cooperation between respective	4c Improvement of the operational system structure	4d Improvement of the transport system	4e Reduce/mitigate environmental impact	4f Improvement of energy efficiency	4g Financial sustainability of the transport system
Railway																					
Railway network elements																					
R.1 Koper–Ljubljana			■						■	■		■		■							
R.2 Zidani Most–Dobova (HR)	■	■	■	■						■											
R.3 Ljubljana–Jesenice (AT)	■	■	■			■				■		■									
R.4 Ljubljansko železniško vozlišče (LŽV)		■	■	■	■	■				■		■									
R.5 Ljubljana–Zidani Most		■	■	■						■		■									
R.6 Divača–Sežana (IT)	■		■				■		■												
R.7 Pragersko–Hodoš (HU)	■	■	■	■									■								
R.8 Maribor–Šentilj (AT)	■	■	■	■									■								
R.9 Pragersko–Maribor		■	■	■									■								
R.10 Zidani Most–Pragersko		■	■	■									■								
R.11 Postojna–Ilirska Bistrica–Šapjane (HR)	■		■						■	■											
Railway network																					
R.21 ETCS/GSM-R	■	■	■						■						■		■	■			
R.22 Electrification	■	■	■	■	■	■	■	■											■	■	
R.23 Renovation, upgrade of other lines							■	■	■												
R.24 Safety				■	■	■	■	■	■		■							■			
Functioning/organisation of air transport																					
R.31 The reorganisation of user charges for railway lines			■																		■
R.32 Multi-annual contract on the implementation of public services		■		■	■	■	■	■	■	■	■	■	■								■

Measures/ objectives		1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
R.33	Increase of financial sustainability																					■
R.34	Improvement of railway passenger rolling stock		■		■	■	■	■	■	■	■	■	■	■				■		■	■	
R.35	Improvement of railwaygoods rolling stock			■														■		■	■	
R.3	Modernisation of legislation and planning guidelines	■														■	■	■				
R.37	Development of a concept for maintaining the railway network	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
R.38	Reorganisation of operations/ timetables				■	■	■	■	■	■	■	■	■	■						■		
R.39	Measures to prevent, mitigate, and maximise the elimination of the consequences of significant impacts of the plan on the environment, nature, health and cultural heritage (mitigation measures)															■			■	■		
R.40	Developing the network into intermodal hubs and agglomerations according to demand			■																		
R.41	Recycling and use of own waste in construction															■	■			■		
R.42	Preparedness for extreme weather events	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			■	■		
R.43	Provision of migration corridors for wild animals and protection of drivers against collisions with wild animals																		■	■		
R.44	More accessible infrastructure for less mobile persons												■	■	■	■						

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability							
Road traffic																					
Road network elements																					
Ro.1 Draženci–Gruškovje (HR) Motorway	■	■		■																	
Ro.2 Completion of the Karavanke motorway tunnel	■	■	■			■															
Ro.3 Development of the concept of rest/ parking areas on the motorway network, arrangement of areas at former international border crossings			■																		
Ro.4 Connection of Bela Krajina with Novo Mesto					■																
Ro.5 Novo Mesto city network					■																
Ro.6 Connection of Bohinj and Bled with Ljubljana						■															
Ro.7 Conn. of Bovec, Tolmin and Cerkno with Ljubljana						■	■				■										
Ro.8 Škofja Loka city network						■															
Ro.9 Conn. of Koroška regionwith the motorway system								■			■										
Ro.10 Conn. of Hrastnik with Zidani Most										■	■										
Ro.11 Conn. of Kočevje with Ljubljana										■	■										
Ro.12 Ljubljana motorway ring and motorway connecting roads and their rearrangement		■	■							■		■									
Ro.13 Gorenjska–Štajerska connection				■						■											
Ro.14 Štajerska–Dolenjska connection				■	■		■			■											
Ro.15 Connection of Škofja Loka/Medvode with Ljubljana						■				■											
Ro.16 Road network around Maribor				■									■								
Ro.17 Road network around Koper, connection of the Koper–Izola–Piran conurbation (section between Jagodje and Lucija) with the motorway system									■					■							

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
Ro.18 Connection of Ilirska Bistrica (HR) with the motorway system									■												
Ro.19 Celje road network				■						■	■										
Ro.20 Conn. of Ormož with Ptuj/Maribor				■							■										
Ro.21 Nova Gorica city network							■				■										
Ro.22 Connection of Kozjansko, Rogaška Slatina and the hinterlands with core network				■	■						■										
Road network																					
Ro.31 Improvement of the accessibility of regions without a direct connection to the TEN-T network											■										
Ro.32 Traffic management, monitoring and counting, and information system	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■				■
Ro.33 Measures to prevent, mitigate,and maximise the elimination of the consequences of significant impacts of the plan on the environment, nature, health and cultural heritage (mitigation measures)															■			■	■		
Ro.34 Developing the network into intermodal hubs and agglomerations according to demand			■									■	■	■							
Ro.35 Stimulation of the use of eco-friendly vehicles and construction of a charging station network		■										■	■	■					■	■	
Ro.36 Internalisation of external costs												■	■	■					■		■
Ro.37 Restrictive parking policy												■	■	■					■		

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
Functioning/organisation of road traffic																					
Ro.41 Modernisation of legislation and planning guidelines	■														■	■					
Ro.42 Improvement of financial sustainability of the road network and the toll collection system		■	■																		■
Ro.43 Provision of an adequate standard of the existing road infrastructure (including road reconstruction at the secondary and tertiary levels)											■										■
Ro.44 Recycling and application of own waste in construction															■	■			■		
Ro.45 Reduction of pollutant emissions															■				■		
Ro.46 Preparedness for extreme weather events	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			■	■		
Ro.47 Provision of migration corridors for wild animals and protection of drivers against collisions with wild animals																			■		
Ro.48 More accessible infrastructure for less mobile persons											■	■	■	■							
City and suburban network																					
City network elements																					
U.1 Kamnik–Ljubljana corridor						■				■		■									
U.2 Kranj–Ljubljana corridor						■				■		■									
U.3 Grosuplje–Ljubljana corridor					■					■		■									
U.4 Connection of Ljubljana with the airport						■				■		■									

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
Urban network																					
U.11 Ljubljana P+R (Park and Ride)										■		■									
U.12 Maribor P + R													■								
U.13 Slovenia P + R				■																	
U.14 Development of stations											■										
U.15 Separation of transport types – giving priority to public transport, elimination of congestion												■	■								
U.16 Enhancing intermodality (P+R, etc.)											■	■									
U.17 Bicycle network											■	■	■	■							
Functioning/organisation of city traffic																					
U.31 Introduction of a uniform ticket											■	■	■								■
U.32 Introduction of public transport service on demand											■			■							
U.33 Adjustment of timetables (harmonised)											■					■	■				
U.34 Administrative capacities and training															■						
U.35 Vehicle fleet modernisation											■	■	■	■				■	■	■	
U.36 Information platform											■	■	■	■		■	■				
U.37 Support for non-profit groups in the field of transport																■	■				
U.38 Management and information on transport and logistics				■	■	■	■	■	■	■	■					■	■				
U.39 Review/modernisation of local/ regional central transport plans											■	■	■	■	■	■	■				
U.40 Measures to prevent, mitigate, and maximise the elimination of the consequences of significant impacts of the plan on the environment, nature, health and cultural heritage (mitigation measures)											■	■	■						■		

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
U.41 Preparedness for extreme weather events												■	■	■					■		
Water-borne transport																					
Element of water network																					
M.1 The Port of Koper – Piers 1 and 2 extension			■																		
M.2 The Port of Koper – Pier 3 construction			■																		
M.3 The Port of Koper –according to measures M.1, M.2 and M.4, also the rearrangement of port infrastructure			■																		
M.4 The Port of Koper – deepening of entry canals and port pools;			■																		
M.5 The Port of Koper – construction of the passenger terminal facility and arrangement of infrastructure		■																			
M.6 The establishment of an international inland waterway along the Sava River between Brežice and Obrežje			■																		
Water network																					
M.11 Charging stations or alternative fuels															■				■	■	
M.12 Establishment of a single window for the organisation of motorways of the sea and short-time maritime transport; participation in activities to establish the free movement of goods by sea, the Blue Belt.			■								■				■						
M.13 Establishment of the VTS centre for monitoring maritime transport																		■			

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
Functioning/organisation of water-borne transport																					
M.21 Development of logistics activity in the Port of Koper and provision of final connections ("last miles")			■																		
M.34 Provision of administrative capacities and training														■	■	■					
M.35 Measures to prevent, mitigate, and maximise the elimination of the consequences of significant impacts of the plan (mitigation measures)																		■			
M.36 Determination of the navigation categories of inland waterways in Slovenia in regional categories (I–III) in areas of rivers and lakes with proper conditions											■	■		■			■				
M.37 Provision of navigation safety on inland waterways by incorporating the EU IWW legislation and and rules of the International Sava River Basin Commission into Slovenian legislation														■			■				
Air transport																					
Air network elements																					
A.1 Ljubljana Jože Pučnik Airport – The continuation of development for the needs of transporting passengers, mail and/or goods.		■	■																		
A2 Maribor Edvard Rusjan Airport – The continuation of development for the needs of transporting passengers, mail and/or goods.		■																			

Measures/ objectives	1. Improvement of transport connections and harmonisation with neighbouring countries			2. Improvement of national and regional connections within Slovenia								3. Improving the accessibility of passengers to the main urban agglomerations and within them			4. Improvement of the organisational and operational structure of the transport system to ensure system efficiency and sustainability						
A.3 Portorož airport –The continuation of development for the needs of transporting passengers, mail and/or goods and the provision of the proper infrastructure for regular airport operation.																					
Air navigation services																					
A10 Air navigation services																					
A.11 Charging stations for alternative fuel																					
Functioning/organisation of air transport																					
A.21 Developing the network into intermodal hubs, agglomerations in accordance with demand/ development of logistics activity																					

8 Monitoring the state

Environmental impact

Indicators for monitoring the environmental impact of the Strategy were proposed on the basis of the results of the environmental assessment. Indicators that are measurable and whose state is already being monitored in Slovenia are proposed as priorities. These are indicators the results of which are systematically collected, processed and reported at the state level. When selecting indicators, indicators were used which are already being used to measure the state of the environment in Slovenia as part of the EIONET-SI network, which was established due to Slovenia's obligation to report to the European Environment Agency. If an indicator is already being monitored, its official sequence number is recorded next to it.

Indicators were also sought among data collected by individual organisations/institutions (the Hunters Association of Slovenia, the Ministry of the Interior, the Ministry of Culture). These indicators do not have sequence numbers.

Monitoring the state of certain environmental objectives is not necessary, as the environmental objective will be attained by observing guidelines and mitigation measures.

Environmental indicators are monitored by the entity preparing the Strategy in the Republic of Slovenia (Ministry of Infrastructure).

Table 8.1 shows the connection between the selected environmental objectives and indicators proposed to monitor the state.

Table 8.1: Relationship between the environmental objectives and proposed environmental indicators

Environmental objective	Proposed environmental indicators
Environmental objective 1: Provide sustainable land management and soil protection	Land cover and land use [TP01]
Environmental objective 3: Ensure the attainment of long-term objectives for annual quantities of pollutant emissions determined for the transport sector in the Operational programme for complying with national emission ceilings for atmospheric pollutants	Emissions of gases that cause acidification [ZR09] Emissions of particulates into the air [ZR15] Emissions of ozone precursors [ZR10]
Environmental objective 4: to adapt transport infrastructure to climate change and reduce annual quantities of greenhouse gas emissions below the target values determined for the transport sector in the Operational programme of measures to reduce greenhouse gas emissions by 2020	Greenhouse gas emissions [PS03]
Environmental objective 5: Limit the effects of the pressure of transport infrastructure on surface water, groundwater, brackish water, coastal waters and sources of drinking water	Potential risk for waters in the event of accidents during the transport of hazardous substances
Environmental objective 5: Limit the effects of the pressure of transport infrastructure on surface water, groundwater, brackish water, coastal waters and sources of drinking water	Chemical and ecological state of the sea [MO06]
Environmental objective 6: Ensuring the cohesion of populations and conservation of biodiversity	Collisions with wild animals
Environmental objective 7: Protect areas with nature protection status against activities with considerable impacts	Habitat fragmentation [SEBI013]
Environmental objective 9: Reduce the pollution of the environment by noise from transport, and approximate to the levels recommended by the World Health Organisation	Exposure to noise from transport [PR18]
Environmental objective 10: Improve social cohesiveness, traffic safety and sustainable mobility	Investments in transport infrastructure [PR03] Volume and structure of passenger transport and traffic [PR01] Number of accidents, casualties and injured in road and rail transport [PR10]

Soil and mineral resources

Land cover and land use [TP01]

The indicator shows the features and development of land cover and land use in Slovenia in 1996, 2000 and 2006 captured according to the CORINE Land Cover methodology. The indicator is prepared every four to six years. Databases are available at the Surveying and Mapping Authority of the Republic of Slovenia. The description of the indicator for 2008 is available, while data for 2012 are being prepared. The Ministry of Infrastructure verifies the data on the state of the indicator every five years.

Air

Emissions of gases that cause acidification [ZR09]; Emissions of particulates into the air [ZR15]; Emissions of ozone precursors [ZR10]

The database on the state monitoring of ambient air quality is used to monitor the state, which is ensured by the ARSO. Data are collected in accordance with annual monitoring programmes of ambient air quality (control and operational monitoring), while the assessment of excessive ambient air pollution is carried out after each calendar year. The Ministry of Infrastructure verifies the data on the state of the indicator with the ARSO. The data on the state of the indicator are verified every five years and linked to the implemented measures of the Strategy.

Climate factors

Greenhouse gas emissions [PS03]

The source database or the source for designing the indicators was the record of greenhouse gas emissions, GHG archives, Slovenian Environment Agency. The administrator of the data is the Slovenian Environment Agency. Data on greenhouse gas emissions are presented for the 1986–2011 period and updated annually. The latest data refer to the last two-year period and become available in April of the current year. The Ministry of Infrastructure verifies the data on the state of the indicator with the ARSO every five years.

Water

Potential risk to waters in the event of accidents during the transport of hazardous substances

The analysis of potential water risk was prepared within the WMP 2009–2015. The indicator is updated with amendments to the Water Management Plan (every five years). The Ministry of Infrastructure verifies the data on the state of the indicator with the ministry responsible for the environment.

Chemical and ecological state of the sea [MO06]

As per the Water Directive and national regulations, i.e. the Decree on Surface Water Status (Official Gazette of the Republic of Slovenia Nos 14/09, 98/10, 96/13) and the Rules on surface water status monitoring (Official Gazette of the Republic of Slovenia, No 10/09), the quality of the sea is determined as a chemical and ecological status. The Slovenian Environment Agency collects data annually, based on the water status monitoring programme.

In 2016, pursuant to the Marine Directive, the implementation of the marine environment management plan was initiated, including the definition of marine environment status monitoring. Pursuant to the marine environment management plan, the respective legal bases will be adapted, including the Decree on Surface Water Status, which will be amended with the elements to monitor the marine environment status. A competent institution for the monitoring

of marine environment will monitor and collect the data on the marine environment status (currently ARSO). After the introduction of marine environment status monitoring, the Ministry of Infrastructure (pursuant to the provisions of the Marine Directive) must obtain data from the institution responsible for marine environment status monitoring. The Ministry of Infrastructure verifies the data on the state of the indicator every five years.

Nature

Wildlife roadkill

The record of roadkill of wild animals is kept by the Slovenia Forest Service. The Ministry of Infrastructure verifies the data on the state of the indicator with the Slovenia Forest Service every five years.

Habitat fragmentation [SEBI013]

The state of the indicator is monitored by the European Environment Agency. The indicator is based on the modifications of the CLC (Corine land cover). The data on the state of the indicator are verified by the Ministry of Infrastructure every five years.

Health

Exposure to noise from transport [PR18]

The indicator shows noise exposure along important roads and railway lines, and separately, noise exposure in areas of settlements (Ljubljana and Maribor) from road and rail transport, and important industrial facilities and devices. The entities responsible for preparing data on noise pollution in the environment are managers of individual noise sources (motorway network – DARS d. d., national road network – DRSC and national railway network – Ministry of Infrastructure) and the two settlement areas (Municipality of Ljubljana and Municipality of Maribor). The data on the state of the indicator are verified by the Ministry of Infrastructure every five years.

Population and material assets

Investments in transport infrastructure [PR03] (EEA keeps this indicator as TERM 019)

Data on amounts invested in the motorway network since 1994 have been published by the Motorway Company of the Republic of Slovenia in its annual reports. Data on the amounts invested in state roads, and rail, water and air infrastructure are published annually in the annual financial statement of the national budget by the Ministry of Finance. The Ministry of Infrastructure verifies the data on the state of the indicator every five years. Based on the data, it is established whether any changes in the amount of investments in various types of transport infrastructure have occurred.

Volume and structure of passenger transport and traffic [PR01]

The data on the scope and structure of passenger transport in Slovenia is collected by the SORS and published in the regular annual serial publication 'Statistical Yearbook of the Republic of Slovenia' and on the data portal SI-STAT. The Ministry of Infrastructure verifies the data on the state of the indicator every five years. Based on the data, it is established whether any changes in the scope and structure of passenger transport have occurred.

Number of accidents, fatalities and persons injured in road and rail transport [PR10]
The Ministry of the Interior reports the data on road accidents to the Statistical Office. The data are updated annually. The Ministry of Infrastructure verifies the data on the state of the indicator every five years. Based on the data, it is established whether any changes in the number of fatalities, victims or persons injured in road and rail transport have occurred.

Transport model

The transport model is described in detail in Point 4.3 of this document. Measure Ro.32 "Transport model" is also determined for the performance of the model – Transport management is an important segment of the transport system. Traffic data collection and processing is a basis for complementing the traffic database. Traffic counting is conducted in various manners, whereby access to data at the proper platforms, which are also publicly accessible, needs to be ensured. The functions of traffic control, management and operation form a basis for optimising traffic flow levels. Efficient systems enable management to minimise congestions during regular traffic flow and during, for example, exceptional traffic events. The national transport model was developed within the scope of the broader preparation of the transport system development documents in the Republic of Slovenia. The model has to be maintained and upgraded also with new research (e.g. surveys in households, other research projects); thus it is constantly up to date.

9 Comprehensive environmental impact assessment

The Strategy has been placed among the programmes that have a significant impact on the environment. For this reason, it is necessary (pursuant to Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the impacts of certain plans and programmes on the environment) to assess the consequences of the impacts in the strategy of planned measures and alternative measures on the environment before its adoption in the comprehensive environmental impact assessment procedure, and to take a position on measures that are unacceptable due to the environmental impact. The respective Directive requires that Member States take a position and consult also on the cross-border impacts of plans and programmes.

The Ministry of Agriculture and the Environment has issued Decision No 35409-24/2012/14, on the basis of which it is necessary, along with the drafting of the Strategy in accordance with the Environmental Protection Act, to carry out a comprehensive environmental impact assessment, and within this procedure, also an acceptability assessment of the impact of plans on protected areas on the basis of the Nature Conservation Act. The purpose of both these assessments is to prevent or at least significantly reduce activities that may have significant adverse impacts or consequences on the environment and protected areas, and thus achieve the principles of sustainable development, comprehensiveness and prevention. Within the environmental impact assessment procedure, impacts are determined based on the Environmental Report. The procedure is conducted by the ministry responsible for the environment. Within the said procedure, the cooperation of all line ministries and state bodies and organisations responsible for individual sectors, as well notification and public participation, are all provided for.

The purpose of the comprehensive environmental impact assessment is to provide a high level of environmental protection and contribute to the inclusion of environmental aspects in the drafting of the Strategy. Therefore, the authors of the Environmental Report were included in drafting the Strategy already in the initial phase of the document's preparation. The comprehensive environmental impact assessment is completed with a decision on the suitability of the Environmental Report and acceptability of the Strategy.

Pursuant to the Environment Protection Act, a position is to be taken in the comprehensive assessment of environmental impact on the wider framework of environmental policies and environmental protection goals. During the scoping, an Environmental Report was drawn up entitled "Starting points for drafting an environmental report for the programme of transport infrastructure development in the Republic of Slovenia" This report defines:

- the environmental objectives of the programme in terms of its characteristics; in particular in relation to the area and content;
- assessment criteria which can represent the levels of deviation from the indicators of the state of environment, levels of attaining the protection objectives and other criteria which provide for a suitable assessment of impacts;
- essential environmental areas which are being assessed;
- methodology for establishing impacts.

The proposal of the report "Starting points for drafting an environmental report for the programme of transport infrastructure development in the Republic of Slovenia" was prepared in February 2014 and submitted to the competent ministry, which obtained the opinion of the relevant holders of spatial planning. The report was amended in June 2014 on the basis of opinions and harmonisations.

In accordance with the Decree laying down the content of an environmental report and on the detailed procedure for the assessment of the effects of certain plans and programmes on the

environment (Official Gazette of the Republic of Slovenia, No 73/05), the Environmental Report defines, describes and evaluates the impacts of implementing the Strategy on the environment (soil and mineral resources, air, waters, climate factors, nature conservation, cultural heritage, landscape, human health, and population and material assets). In accordance with the regulations governing the conservation of nature (Rules on the Assessment of Acceptability of Impacts Caused by the Execution of Plans and Activities Affecting Nature in Protected Areas (Official Gazette of the RS, Nos 130/04, 53/06, 3/11)), the assessment of the impacts of the Strategy on protected areas was made as a special document.

The environmental assessment is conducted by environmental aspects and by groups of measures for all 21 sub-objectives of the Strategy, namely in terms of attaining an individually defined environmental objective. In general, it was established that by suitably placing spatial interventions and taking all necessary mitigating measures, all groups of measures are acceptable from the environmental aspect.
The Environmental Report was first submitted for an opinion to the ministry responsible for the environment at the end of July 2014. The ministry invited relevant spatial planning stakeholders to draw up an opinion, namely the Ministry of Culture, Slovenian Institute for Nature Conservation, Slovenian Environment Agency, Water Management Office, Ministry of Health and Slovenia Forest Service. After obtaining the opinion of all respective stakeholders, the ministry responsible for the environment in its letter no. 35409-24/2012/40 of 26 September 2014 issued a requirement to supplement the Environmental Report. Coordination meetings were held, on the basis of which the report was supplemented. The ministry responsible for the environment issued an opinion on its suitability on 14 November 2014 (opinion no. 35409-24/2012/45).

The Environmental Report was publicly displayed from 15 December 2014 to 31 January 2015. During the public display, a public presentation of the Report and Strategy was also organised on 9 January 2015. It was attended by representatives of municipalities, regional development agencies, non-governmental organisations, ministries, infrastructure managers, chambers of commerce and chambers of craft, expert associations, civil initiatives and some other individuals. In addition to the aforementioned presentation, the authors of the Strategy and Environmental Report participated in several presentations in municipalities (e.g. Idrija, Ormož), conferences (e.g. InfraKon), round tables (e.g. Coalition for Sustainable Transport Policy and Plan B), and Ognjišče radio station.

After the public display, positions on the remarks were prepared. Accordingly, the proposal of the Transport Development Strategy in the Republic of Slovenia was prepared in April 2015. The proposal of the Strategy was amended in May 2015 and July 2015. At the same time, the Environmental Report was amended in April 2015 and May 2015.

According to the methodology, alternatives were also assessed (measures in rail , road, public, water-borne and air transport). The assessment of alternatives showed that in selecting measures, priority should be given to developing public, rail and water-borne transport over road and air transport, and reconstruction over the construction of new structures to provide sustainable and natural development. Individual measures in the railway, road and air transport networks are assessed as conditionally compliant according to the respective environmental objectives. Conditionally harmonised measures of transport policy are as follows:

Rail transport:

- R.1 Koper–Ljubljana,
- R.3 Ljubljana–Jesenice.

Road transport:

- Ro.9 Connecting the Koroška region with the motorway system;
- Ro.10 Connecting Hrastnik with Zidani Most;
- Ro.11 Connecting Kočevje with Ljubljana;
- Ro.12 Ljubljana motorway ring and motorway connecting roads and their rearrangement;
- Ro.15 Connecting Škofja Loka/Medvode with Ljubljana;
- Ro.16 Road network around Maribor;
- Ro.18 Connecting Ilirska Bistrica (HR) with the motorway system.

Air transport:

- A.2 Maribor Edvard Rusjan Airport;
- A.3 Portorož Airport.

During the comprehensive environmental impact assessment, it was established that the implementation of the Strategy will probably have a significant cross-border environmental impact. Pursuant to Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the impacts of certain plans and programmes on the environment, the competent ministry in June 2014 started cross-border consultations under the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context. Four countries participated in the procedure of cross-border assessment: The Republic of Austria, Republic of Hungary, Republic of Croatia and Republic of Italy. A report on the implementation of the cross-border procedure was also prepared (Aquarius, d.o.o., Ljubljana, July 2015)

Guidelines and mitigation measures from the aspect of environment protection

To attain the environmental objectives of the Transport Development Strategy of the Republic of Slovenia, the Environmental Report also defines the guidelines and mitigation measures that must be taken into account when implementing the Strategy.

The Environmental Report also defines specific mitigation measures for individual transport measures within a particular sub-objective. These must be taken into account when planning each transport measure.

The most important general guidelines for planning transport policy from the environmental protection aspect are:

- Measures defined in the Strategy are of strategic nature and are not spatially integrated or prepared at the project level. Therefore, the comprehensive environmental impact assessment for individual infrastructure measures will have to be prepared in the next phases of drafting project documentation.[61]
- A comprehensive assessment of the acceptability of individual measures which could have a significant impact on nature protection areas must be implemented at the level of a detailed plan or intervention, as per Article 25.a of the Rules on the assessment of the acceptability of impacts caused by the execution of plans and activities affecting nature in protected areas (Official Gazette of the Republic of Slovenia, Nos 130/04, 53/06, 38/10, 03/11).[62]
- When selecting measures, the development of public and rail transport should be favoured over road and air transport, and reconstruction over the construction of new structures to ensure sustainable and natural development.
- The need to integrate new rail and road connections should be examined in special studies (from the aspects of landscape, environment, project solutions and economic viability). Credible transport data and the cooperation of experienced experts from individual areas must be provided for the preparation of these studies.

61: The exceptions are interventions for which comprehensive assessments of impacts have already been conducted.

62: The exceptions are interventions for which an acceptability assessment of the impacts on protected areas has already been conducted.

1. Guidelines and mitigation measures – Soil and mineral resources

To provide the sustainable management of land and sustainable use of soil, the following guidelines are to be considered:

- Activities in agricultural land and woodland must be reduced to the lowest level possible, while land with poorer productive potential and land outside dense forest areas and forest areas with important wood production functions at the first level must be given top priority.
- Transport infrastructure should be planned in a way that does not raise the risk of landslides in the wider area of activities. The impact on bank erosion must be prevented when constructing ports on inland waterways.
- Recycling and the use of own waste in the construction and reconstruction of transport infrastructure and also the use of certified construction materials from recycled by-products or waste material from other sectors must be stimulated.

In spatial planning, special mitigation measures must also be taken into account:

Sub-objectives	Special mitigation measures
1a	In the spatial integration of measures R.3, R.6 and Ro.1, protective forests, especially along the Sava River (R.3) and the Mura River (R.7) and north from Brestanica pri Komnu (R.6), and forest areas with defined wood production functions at the first level must be avoided. Activities on agricultural land and woodland must be reduced in measures R.3, R.6, R.8 and Ro.1 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
1b	In the spatial integration of measures R.3, R.5 and R.10, protective forests, especially along the Sava River (R.3, R.5) and the Savinja River (R.10) and at Spodnja Polskava (R.p), and forest areas with defined wood production functions at the first level must be avoided. Interventions in agricultural and forest land have to be reduced in R.3, R.5, R.8, R.10, Ro.1 and A.3 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potentials and land outside dense forest stands has to be given priority.
1c	In the spatial integration of R.3, R.5, R.10 and Ro.12, protective forests have to be avoided, especially along the Sava River (R.3, R.5) and the Savinja River (R.10), at Spodnja Polskava (R.9) and east of Logatec, in Zadobrova and Polje in Ljubljana (Ro.12), as well as forest areas with defined wood production functions at the first level. Activities on agricultural land and woodland must be reduced in measures R.1, R.3, R.5, R.8, R.10 and Ro.12 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
2a	In the spatial integration of R.5, R.10, Ro.13, Ro.14 and Ro.20, protective forests have to be avoided, especially along the Sava River (R.5, R.10, Ro.14), the Savinja River (Ro.14, R.10) and at the Borovci settlement (Ro.20), as well as forest areas with defined wood production functions at the first level. Intervention in agricultural and forest land has to be reduced in R.5, R.8, R.10, Ro.1, Ro.13, Ro.14 and Ro.20 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands has to be given priority.
2b	In the spatial integration of Ro.14, protective forests have to be avoided, especially along the Sava and the Savinja rivers, as well as forest areas with defined wood production functions at the first level. Activities on agricultural land and woodland must be reduced in measures Ro.4 and Ro.14 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
2c	In the spatial integration of Ro.7, R.3, Ro.06 and Ro.13 , protective forests have to be avoided, especially along the Sava and Savinja rivers, as well as forest areas with defined wood production functions at the first level. Activities on agricultural land and woodland must be reduced in measures R.3, Ro.6, Ro.7, Ro.13 and U.4 (railway) with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
2.d	In the spatial integration of R.6, protective forests have to be avoided, especially at Brestanica pri Komnu and forest areas with defined wood production functions at the first level. In the spatial integration of Ro.7, protective forests have to be especially avoided, as well as forest areas with defined wood production functions at the first level. Activities on agricultural land and woodland must be reduced in measures R.6 and Ro.7 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
2e	In the spatial integration of Ro.9, protective forests have to be especially avoided along the Paka and Velunja rivers, as well as the forest areas with defined wood production functions at the first level. Activities on agricultural land and woodland must be reduced in measure Ro.9 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
2f	In the spatial integration of Ro.18, forest areas with defined wood production functions at the first level have to be avoided. Activities on agricultural land and woodland must be reduced in measures Ro.18 and Ro.17 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.

2g	In the spatial integration of R.3, R.5, Ro.10, Ro.13 and Ro.14, protective forests have to be avoided, especially along the Sava and the Savinja rivers (R.10) and south from Radomlje, and forest areas with defined wood production functions at the first level. Activities in agricultural land and woodland must be reduced in R.1, R.3, R.5, Ro.10, Ro.11, Ro.13, Ro.14, Ro.15, U.4 (railway), Ro.11, Ro.15 and U.4 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
2h	In the spatial integration of Ro.7, Ro.10, Ro.13 and Ro.20, protective forests have to be avoided, especially along the Sava and Savinja rivers and south from Radomlje, protective forests of the Idrijsko-Cerkljansko Hills and at Boranci, and forest areas with defined wood production functions at the first level. Intervention in agricultural and forest land has to be reduced in Ro.7, Ro.9, Ro.10, Ro.11 and Ro.20 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands has to be given priority.
3a	In the spatial integration of measures R.3 and R.5, protective forests have to be avoided, especially along the Sava River, as well as forest areas with defined wood production functions at the first level. Activities on agricultural land and woodland must be reduced in measures R.1, R.3, R.5, U.4 (railway) with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
3b	In the spatial integration of measure Ro.10, protective forests have to be avoided, especially along the Sava and Savinja rivers, as well as forest areas with defined wood production functions at the first level. Activities on agricultural land and woodland must be reduced in measures R.8 and R.10 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
3c	In the spatial integration of measure R.1, forest areas with defined wood production functions at the first level have to be avoided. Activities on agricultural land and woodland must be reduced in measures R.1 and Ro.17 with the rational integration of individual transport infrastructure, whereby the use of land with lower productive potential and land outside dense forest stands must be given priority.
4a–g	-

2. Guidelines and Mitigation Measures – Air

The Strategy measures are mainly local nature, which is why it is recommended that some are also included in the more detailed programmes of measures for reducing PM10 particle pollution which are prepared on the basis of already adopted Decrees on the plans for air quality in the area of extensive pollution of ambient air.

Reducing private passenger transport should be a priority of all large cities with a large number of daily commuters. In addition to measures to reduce private passenger transport in towns based on the internalisation of the environmental costs and related to the time limitation of parking and high parking fees, strategies should be implemented to improve public transport, both urban and local. People would use public transport services more frequently if it were available at more favourable prices and did not additionally impede the everyday tempo of activities. The stated measures will contribute to reducing pollutant emissions into the air and thus also prevent the attainment of ceilings of national emissions into the atmosphere.

3. Guidelines and Mitigation Measures – Climate factors

In the preparation of measures to meet the transport objectives of the Strategy, so-called indicative objectives to reduce greenhouse gas emissions need to be considered to mitigate climate change. These objectives are listed for individual sectors in the draft of the Operational Programme for Reducing Greenhouse Gas Emissions by 2020 with a vision by 2030. The indicative sectoral objectives to reduce greenhouse gas emissions for transport are as follows:

- the rapid rise in greenhouse gas emissions must be halted and reduced by 9 per cent by 2020 in comparison with 2008 through the introduction of sustainable mobility measures;
- the increase of greenhouse gas emissions produced by transport must be reversed so as to prevent their increase by more than 18 per cent by 2030 in comparison with 2005, i.e. a 15 per cent reduction by 2030 in comparison with 2008;
- a vision of further emission reduction by 90 per cent by 2050 must be integrated into measures for the attainment of the objectives of the Strategy

To attain the environmental target value defined for the transport sector in the Operational Programme for Reducing Greenhouse Gas Emissions by 2020 with a vision by 2030, special importance is given to measures to attain the sub-objectives of the Strategy included in specific objective no. 4 – Improving the organisational and operational structure of the transport system to ensure its efficiency and sustainability, among which special focus in terms of climate change mitigation should be put on:

- establishing charging stations for alternative fuels,
- internalisation of external costs; and
- implementation of restrictive parking policies in urban areas.

The Strategy measures need to be planned in a resource-efficient way, meaning that the sensitivity of transport infrastructure to climate change, natural disasters and anthropogenic disasters is also properly addressed. For all measures of new arrangements of transport infrastructure in terms of adaptation to climate change, it is necessary to:

- ensure the preparation of a sensitivity analysis of transport infrastructure to climate change; and
- implement measures and adjustments on the basis of the findings of the analysis which properly improve the infrastructure's resilience to climate change.

To attain the environmental objective regarding climate change adaptation, the following must be ensured:

- it needs to be ensured that transport infrastructure in Slovenia in the long term becomes less sensitive to the consequences of extreme precipitation due to floods or sudden snow on road surfaces, and the railway network in particular needs to become less sensitive to glaze ice;
- when planning any new construction or expansion of the existing transport network, a sensitivity analysis of the transport infrastructure for the aforementioned extreme weather conditions needs to be carried out, and on the basis of its findings, a plan of measures to permanently reduce the consequences of these phenomena must be prepared;
- it has to be ensured that the implementation of measures to reduce the sensitivity of the transport network to extreme weather conditions becomes one of the central tasks of the transport network management, whereby the purpose of these measures has to be based especially on reducing damage caused to users of the climate change sensitive network due to the inability to use it.

4. Guidelines and Mitigation Measures – Water

To limit the heavy effects of transport infrastructure on fresh water sources and thus prevent negative impacts on fresh water quality, the integration of transport infrastructure into water protected areas has to be avoided.

Integrating facilities in areas at risk of flood and related erosion must be also avoided. When carrying out interventions in these areas, it must be proved that the existing risk of flood of the wider area will not increase.

When planning interventions in areas with extremely high, very high and highly vulnerable aquifers, it is necessary to study and plan appropriate technical solutions that prevent the negative impacts of the construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances).

Transport infrastructure should not be integrated into coastal land. According to Article 37 of the Waters Act, an exception is possible only on the basis of expert argumentation stating that the facility cannot be sited elsewhere without disproportionately high costs. The costs of the

reduction of ecosystem services in the case of potential interventions in the coastal area must also be included in the cost calculation.

Within the scope of national and local regulations, proper legal solutions must be established, including the type of permitted motorised vessels for individual watercourses, forms of navigation, navigation safety and supervision of navigational regimes. Impacts on the ecological status of water, aquatic organisms, flora and fauna on banks and in nature conservation areas, erosion and flood protection must be prevented when constructing ports, arranging waterways and navigating inland waterways.

In spatial planning, special mitigation measures must be also taken into account:

Sub-objectives	Special mitigation measures
1a	The following must be taken into account in measures Ro.1, Ro.2, and R.3: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment should also include an appropriate way to bridge such an area in accordance with groundwater protection.
1b	The following must be taken into account in measures Ro.1, Ro.2, Ro.13, R.3 and A.2: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection. The following must be taken into account in measure A.3: appropriate technical solutions must be planned to prevent negative impacts on bathing waters in the wide area of Strunjan, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances).
1c	The following must be taken into account in measures R.3 and Ro.12, Ro.2, R.1: There is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection. The following must be taken into account in measure R.1, M.1–M.4: appropriate technical solutions must be planned to prevent negative impacts on bathing waters in the wide area of Koper, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances).
2a	The following must be taken into account in measures Ro.1, Ro.13, Ro.16 and Ro.20 : there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection.
2b	–
2c	The following must be taken into account in measures R.3, Ro.6, Ro.13, Ro.15, U.4 and Ro.2 : there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection.
2.d	The following must be taken into account in measures Ro.6 and Ro.7: appropriate technical solutions must be planned to prevent negative impacts on bathing waters, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances). The following must be taken into account in measure R.6: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection. The following must be taken into account in measure Ro.7: appropriate technical solutions must be planned to prevent negative impacts on bathing waters, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances).
2e	The following must be taken into account in measure Ro.9: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection.

2f	The following must be taken into account in measure R.1: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include the appropriate way of bridging such an area in accordance with groundwater protection. The following must be taken into account in measures R.1 and Ro.17: appropriate technical solutions must be planned to prevent negative impacts on bathing waters in the wide area of Koper, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances). The following must be taken into account in measure Ro.18: if the route passes through the area of influence of the Škocjan Caves Regional Park, appropriate technical measures must be provided to facilitate the efficient prevention of district groundwater pollution in the respective area.
2g	The following must be taken into account in measures R.1, R.3, Ro.10, Ro.12, Ro.13, Ro.15 and U.4: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection. The following must be taken into account in measure R.1: appropriate technical solutions must be planned to prevent negative impacts on bathing waters in the wide area of Koper, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances).
2h	The following must be taken into account in measures Ro.7, Ro.9, Ro.10, Ro.20 and Ro.21: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection.
3a	The following must be taken into account in measures R.1, R.5, Ro.12 and U.4 (railway): there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection. The following must be taken into account in measure R.1: appropriate technical solutions must be planned to prevent negative impacts on bathing waters in the wide area of Koper, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances).
3b	The following must be taken into account in measure Ro.16: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection.
3c	The following must be taken into account in measure R.1: there is a great probability that the implementation of the measure will significantly affect a highly vulnerable aquifer; therefore, an assessment of the hazard to groundwater must be prepared during the drafting of project documentation. The assessment must also include an appropriate way to bridge such an area in accordance with groundwater protection. The following must be taken into account in measures R.1 and Ro.17: appropriate technical solutions must be planned to prevent negative impacts on bathing waters, namely during construction and operation, as well as in the case of exceptional events (e.g. spillages of dangerous substances).
4a–g	–

5. Guidelines and Mitigation Measures – Nature

For the sustainable preservation of the natural environment and biodiversity, variants which do not intervene in the naturally preserved area and have a smaller impact on the migration paths of wild animals should be given priority. Measures R.43 and Ro.47 must be implemented to protect individual species of wild animals against collisions with vehicles.

To permanently conserve the natural environment and biodiversity, the selection of measures should be carried out in the following order:

- reconstruction of existing connections has priority over the construction of new traffic routes;
- construction of parallel connections with existing roads and railway connections has priority over siting in natural space;
- if it is not possible to avoid interference with pristine nature, interference with protected areas (Natura 2000 areas and protected areas), EPO and areas of valuable natural features should be avoided;
- variants with less impact on the migration paths of wild animals should be given priority. Transport infrastructure should not be integrated into coastal land. Such interventions may cause significant impacts on the ecological status of watercourses and a reduction of retention surfaces, including cumulative impacts on the biodiversity and ecosystem services of the area.

To protect areas with the nature protection status, it is necessary to observe the following guidelines:

- During the spatial integration of transport infrastructure, areas with valuable natural features must be avoided. Pursuing this guideline will facilitate the preservation of types and characteristics of valuable natural features.
- During the spatial integration of transport infrastructure, protected areas must be avoided. If interventions cannot be avoided and if this is allowed under the Act on the protection of the individual area, it is necessary to observe the guidelines, starting-points and conditions for the protection of nature protected areas laid down in protection regimes adopted with Acts on protection
- During the spatial integration of transport infrastructure, Natura 2000 areas must be avoided. The time for conducting interventions has to be adjusted to the life cycles of animals and plants. Observing the measure will reduce disturbances to these life cycles and increase the probability of attaining or preserving a favourable state of the populations.

If the electrification of a railway line is planned in an area of the flight and migration routes of birds, appropriate technical solutions to prevent collisions of birds with power lines must be foreseen.

According to the objective of the Resolution on National Environmental Action Plan 2005-2012, it is expected that protected areas in the territory of the Republic of Slovenia will be expanded. Therefore, the spatial integration of transport infrastructure in areas proposed for protection should be avoided in order to prevent potential conflicts and negative impacts on attaining the environmental objectives of nature conservation.

The impacts on water organisms, flora and fauna on banks and habitats of species must be prevented when constructing ports, arranging waterways and navigating inland waters. Professional bases must be prepared for waterways to study the impact of navigation on flora, fauna and habitats, and mitigation measures arising from professional bases must be included in decrees.

In spatial planning, special mitigation measures must be also taken into account:

Sub-objectives	Special mitigation measures
1a	Measure R.3 should be designed so as to keep the impact on the integrity and functionality of protected areas low or eliminate it completely (special attention must be paid to the Šmarna Gora area). The following must be taken into account in measure R.8: appropriate technical solutions (e.g. the implementation of bridging in box-shape construction) must be anticipated to prevent the collision of birds with electric power lines spanning the River Drava.
1b	The following must be taken into account in measures R.5, R10 and Ro.12: appropriate passages for wild animals across transport infrastructure must be provided which are in line with best practice in the European Union. The following must be taken into account in measure Ro.12: the priority is to invest in measures of public passenger transport. If the completion of the motorway network is necessary, existing traffic routes should be extended if possible, while activities in the pristine environment must be avoided to the greatest possible extent. Measures R.3 and Ro.12 must be designed so as to keep the impact on the integrity and functionality of protected areas low or eliminate it completely (special attention must be paid to the Šmarna Gora area and the Ljubljana Marshes). The following must be taken into account in measure R.8: appropriate technical solutions (e.g. the implementation of bridging in box-shape construction) must be anticipated to prevent the collision of birds with electric power lines spanning the River Drava. The following must be taken into account in A.3 measure: – the expansion of the airport is permissible if the number of airport operations is decreasing and the number of passengers is increasing; – interventions in the protected area of the Sečovlje salt-pans have to be avoided to the greatest extent possible; – the negative impact on the characteristics of the Sečovlje salt-pan areas, on the basis of which the Ramsar locality, Natura 2000 and landscape park are defined; – the airport shall not be expanded to habitats which are important for preserving biodiversity in the area of Sečovlje salt-pans

1c	The following must be taken into account in measures R.1, R.5 and R.10: appropriate passages for wild animals across the railway line which are in line with best practice in the European Union must be provided. The following must be taken into account in measure R.8: appropriate technical solutions (e.g. the implementation of bridging in box-shape construction) must be anticipated to prevent the collision of birds with electric power lines spanning the River Drava. The following must be taken into account in measure Ro.12: the priority is to invest in measures of public passenger transport. If the completion of the motorway network is necessary, existing traffic routes should be extended if possible, while activities in the pristine environment must be avoided to the greatest possible extent. Measures R.3 and Ro.12 must be designed so as to keep the impact on the integrity and functionality of protected areas low or eliminate it completely (special attention must be paid to the Šmarna Gora area and the Ljubljana Marshes).
2a	The following must be taken into account in measures R.5 and Ro.14: appropriate passages for wild animals across road infrastructure which are in line with best practice in the European Union must be provided. The following must be taken into account in measure R.8: appropriate technical solutions (e.g. the implementation of bridging in box-shape construction) must be anticipated to prevent the collision of birds with electric power lines spanning the River Drava.
2b	The following must be taken into account in measure Ro.4: appropriate passages for wild animals across transport infrastructure which are in line with best practice in the European Union must be determined.
2c	The following must be taken into account in measure Ro.7.: appropriate passages for wild animals across road infrastructure which are in line with best practice in the European Union must be provided. The following must be taken into account in measure Ro.15: the priority is to invest in measures of public passenger transport. If new construction is necessary, existing traffic routes should be extended where possible. Activities in the pristine environment must be avoided to the greatest possible extent. Measure R.3 should be designed so as to keep the impact on the integrity and functionality of protected areas low or eliminate it completely (special attention must be paid to the Šmarna Gora area).
2.d	The following must be taken into account in measure Ro.7.: appropriate passages for wild animals across road infrastructure which are in line with best practice in the European Union must be provided.
2e	The following must be taken into account in measure Ro.9.: appropriate passages for wild animals across transport infrastructure which are in line with best practice in the European Union must be provided.
2f	The following must be taken into account in measures R.1, Ro.17 and Ro.18: appropriate passages for wild animals across railway infrastructure which are in line with best practice in the European Union must be provided. The following must be taken into account in measure Ro.18: the road should be planned outside the area of the Škocjan Caves Regional Park (the area is under UNESCO protection and included among the Ramsar Wetlands). If the route passes through the area of influence of the Škocjan Caves Park, appropriate technical measures must be provided to facilitate the effective prevention of remote groundwater pollution in the respective area.
2g	The following must be taken into account in measures R.1, R.5, Ro.10, Ro.11, Ro.12 and Ro.14: appropriate passages for wild animals across transport infrastructure which are in line with best practice in the European Union must be provided. The following must be taken into account in measure Ro.15: the priority is to invest in measures of public passenger transport. If new construction is necessary, existing traffic routes should be extended where possible. Activities in the pristine environment must be avoided to the greatest possible extent. Measure R.3 should be designed so as to keep the impact on the integrity and functionality of protected areas low or eliminate it completely (special attention must be paid to the Šmarna Gora area).
2h	The following must be taken into account in measures Ro.7, Ro.9, and Ro.11: the priority is to invest in measures of public passenger transport. If new construction is necessary, existing traffic routes should be extended where possible. Activities in the pristine environment must be avoided to the greatest possible extent. The following must be taken into account in measures Ro.7, Ro.9, Ro.10, and Ro.11 : appropriate passages for wild animals across transport infrastructure which are in line with best practice in the European Union must be provided.
3a	In measures R.1, R5 and Ro.12, appropriate passages for wild animals across transport infrastructure which are in line with best practice in the European Union must be provided. Measures R.3 and Ro.12 should be designed so as to keep the impact on the integrity and functionality of protected areas low or eliminate it completely (special attention must be paid to the Šmarna Gora area and the Ljubljana Marshes).
3b	The following must be taken into account in measure R.10: appropriate passages for wild animals across railway lines which are in line with best practice in the European Union must be provided. The following must be taken into account in R.8 measure: appropriate technical solutions (e.g. the implementation of bridging in box-shape construction) must be anticipated to prevent the collision of birds with electric power lines spanning the River Drava.
3c	The following must be taken into account in measure R.1: appropriate passages of wild animals in the area between Vrhnika and Logatec which are in line with best practice in the European Union must be provided. In Ro.17, the migration of wild animals across road infrastructure must be provided.
4a-g	–

6. Guidelines and Mitigation Measures – Human health

a. Air quality

When planning transport policy for areas of excessive ambient air pollution, the following must be considered with regard to transport management on the existing transport network and to its maintenance:

- Ordinance on the air quality plan in Kranj Municipality (Official Gazette of the Republic of Slovenia, no. 108/13);
- Ordinance on the air quality plan in Celje Municipality (Official Gazette of the Republic of Slovenia, no. 108/13);
- Ordinance on the air quality plan in Novo Mesto Municipality (Official Gazette of the Republic of Slovenia, no. 108/13);
- Ordinance on the air quality plan in Maribor Municipality (Official Gazette of the Republic of Slovenia, no. 108/13);
- Ordinance on the air quality plan in the Zasavje area (Official Gazette of the Republic of Slovenia, no. 108/13);
- Ordinance on the air quality plan in the Murska Sobota Municipality area (Official Gazette of the Republic of Slovenia, no. 88/13);
- Ordinance on the air quality plan in Ljubljana Municipality (Official Gazette of the Republic of Slovenia, no. 24/14).

In accordance with the ordinances, a detailed programme of measures to reduce pollution with PM10 particulates will be prepared for problematic areas. The programmes will have to be observed when planning transport policy for the broader problematic area. The priority in the selection procedure should be given to the variant which provides the highest improvement of ambient air quality.

When preparing spatial plans for new infrastructure activities or for the extension of the existing transport network, the following general guidelines must be observed in order to attain the objective of reducing ambient air pollution in areas of influence of respective activities:

- measures to reduce pollutant emissions (prevent congestion, provide smooth traffic flow at moderate travel speeds between 60 and 90 km/h, traffic detours) must be provided to the greatest extent possible;
- measures to prevent increased traffic flow on individual sections of the road network, and measures to prohibit the entry of motor vehicles (especially haulage vehicles) which do not meet environmental standards for new vehicles must be implemented in areas with excessive ambient air pollution;
- populated areas which are especially sensitive to ambient air pollution (residential buildings, Health-care facilities, tourist areas) should be avoided.

In spatial planning, special mitigation measures must be also taken into account:

Sub-objectives	Special mitigation measures
1a	–
1b	In relation to measure R0.12 (Motorway network around Ljubljana), the implementation of the following mitigation measures must be provided in the area of the Ljubljana agglomeration to reduce the number of days with excessive levels of ambient air pollution with particulates: – control road vehicle speed limits during the highest levels of ambient air pollution with particulates in the area of the Ljubljana agglomeration; – regularly maintain the motorway surface with cleaning or other substances to reduce the re-suspension of particles to the largest extent possible; and – improve ambient air quality in the wider motorway network area around Ljubljana, other measures of the detailed programme of measures to reduce pollution with PM(10) particulates must also be considered, which will be prepared for the transport sector and other sources of pollution on the basis of the Ordinance on the air quality plan for Ljubljana Municipality (Official Gazette of the Republic of Slovenia, No 24/14).
1c–2f	–
2g	In relation to measure R0.12 (Motorway network around Ljubljana), the implementation of the following mitigation measures must be provided in the area of the Ljubljana agglomeration to reduce the number of days with excessive levels of ambient air pollution with particles: – control of road vehicle speed limits during the highest levels of ambient air pollution with particulates in the area of theLjubljana agglomeration; – regularly maintain the motorway surface with cleaning or other substances to reduce the re-suspension of particles to the largest extent possible; and – improve ambient air quality in the wider motorway network area around Ljubljana, other measures of the detailed programme of measures to reduce pollution with PM(10) particulates must also be considered, which will be prepared for the transport sector and other sources of pollution on the basis of the Ordinance on the air quality plan for Ljubljana Municipality (Official Gazette of the Republic of Slovenia, No 24/14).
2h	–
3a	In relation to measure R0.12 (Motorway network around Ljubljana), the implementation of the following mitigation measures must be provided in the area of the Ljubljana agglomeration to reduce the number of days with excessive levels of ambient air pollution with particulates: – control of road vehicle speed limits during the highest levels of ambient air pollution with particulates in the area of the Ljubljana agglomeration; – regularly maintain the motorway surface with cleaning or other substances to reduce the re-suspension of particles to the largest extent possible; and – improve ambient air quality in the wider motorway network area around Ljubljana, other measures of the detailed programme of measures to reduce pollution with PM(10) particulates must also be considered, which will be prepared for the transport sector and other sources of pollution on the basis of the Ordinance on the air quality plan for Ljubljana Municipality (Official Gazette of the Republic of Slovenia, No 24/14).
3b	In accordance with the Ordinance on the air quality plan for Maribor Municipality (Official Gazette of the Republic of Slovenia, No 108/13), a detailed programme of measures to reduce pollution with PM10 particulates will be prepared for the Municipality of Maribor. This Programme will have to be observed when planning transport policy in order to attain sub-objective 3b. Priority should be given to measures which provide the improvement of ambient air quality to the greatest extent.
3c	–
4a–g	–

b. Noise pollution

When planning policy on transport infrastructure development, in order to reduce noise pollution in the environment in accordance with Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2012 relating to the assessment and management of environmental noise, respective Slovenian legislation, the Noise Action Programme, and in accordance with Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines on developing the trans-European transport network and repealing Decision No 661/2010/EU, it is necessary to ensure measures that contribute to:

- reducing external transport costs and environmental protection;
- reducing the exposure of residents in urban areas to negative impacts of transit road and rail transport; and
- consequently reduce negative impacts on people's health and well-being.

Noise pollution in Slovenia is highest along the road and railway networks; in particular, it

increases in urban centres and in the areas of more important transport hubs. Pursuant to the Environmental Protection Act, excessive noise polluters must provide measures to reduce this pollution. Measures are necessary in areas where the environment is excessively burdened already, while mitigating measures also have to be carried out on all new transport corridors projected in the Strategy.

The implementation of mitigation measures on the transport network, which is the subject of the policy of transport infrastructure development, must be harmonised with the Noise Action Programme. The Noise Action Programme was adopted in December 2012, and consists of a strategic part, which defines general conditions for the implementation of the anti-noise measures in the existing and new infrastructural sources, and of an implementation part, which defines measures anticipated for the 2012–2017 period to improve the most exposed areas.

When preparing spatial plans for infrastructure activities, the following guidelines to attain the objective of reducing noise pollution must be observed:

- measures to reduce noise emissions at source (measures on the network, vehicle fleet, logistics measures, temporary or permanent rerouting of transit transport, reducing speeds in noise-exposed areas) must be provided to the greatest extent possible;
- in areas with an exceeded limit of environmental burden, measures have to be implemented for the prevention and transmission of noise in the environment (noise barriers and embankments, covered galleries, etc.) and for the provision of living conditions in buildings (passive protection);
- the integration of infrastructure activities in quiet populated areas and/or in areas which under noise protection legislation are defined as especially noise sensitive (residential buildings, health-care facilities, educational and childcare facilities, tourist areas) should be avoided;
- implementing measures in quiet open areas (protected areas in accordance with the regulations on nature preservation) should be avoided.

According to the Noise Action Programme and the noise protection legislation, measures of environmental noise protection on the transport network must be predominantly focused on measures to reduce noise emissions at source, measures to prevent noise expansion into the environment, and, if necessary, measures to provide appropriate living conditions in overexposed buildings.

Measures to reduce noise emissions at source are the most efficient. Reduced noise emissions at transport sources may be achieved mainly through the modernisation of the vehicle fleet (road, rail, air and water-borne transport), additionally through the redirection of traffic flows with an emphasis on shifting long-distance traffic to the railways, and through greater efficiency of public passenger transport by improving the technical characteristics of road and railway surfaces and logistics measures of transport management (temporary rerouting, lowering travelling speeds, etc.). According to the guidelines at the EU level, emissions from individual noise sources are regulated in accordance with the requirements and guidelines of the following programming documents:

- limitation of noise emissions produced by railway rolling stock and infrastructure network pursuant to Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the railway system within the Community (renewal) and TSI guideline C(2011) 658;;
- reduction of noise emission produced by motor vehicles and infrastructure to the lowest possible level (COM(2011) 321);
- limitation of noise emissions from air transport pursuant to Directive 2002/30/EC of the European Parliament and of the Council of 26 March 2002 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports.

Increased impacts of pollution are expected also during the implementation of infrastructure activities. Impacts during construction will be short-term and reversible. The following mitigation measures in particular must be provided to reduce impacts during the implementation of activities:

- use of equipment and construction machinery manufactured in accordance with emissions norms for noise from construction machinery pursuant to the Rules on noise emissions for machinery used in the open;
- observing the time limits on construction near populated areas;
- construction platforms and transport routes must be selected so that noise pollution from transporting material, the operation of equipment at sites and the construction of facilities do not exceed the limit values in the closest buildings;
- implementation of temporary anti-noise measures to protect populated areas near construction platforms and transport routes where limit values are exceeded.

In spatial planning, special mitigation measures must be also taken into account:

Sub-objectives	Special mitigation measures
1a	–
1b	Measure Ro.12 (Motorway network around Ljubljana): the reconstruction of a greater number of areas which have exceeded ceilings will be necessary. The measure is important for protection, since noise pollution in the environment from the national motorway network in the existing state is highest in the area of the northern Ljubljana bypass and also along the remaining section of the Ljubljana motorway ring. In addition to legislative measures, it is estimated that a shift of transit goods transport from the Ljubljana northern bypass will be necessary, while in the Ljubljana ring area, the speed limit will have to be adjusted accordingly. Measures A.2 and A.3 (Maribor and Portorož airports): the reduction of noise from air transport is not feasible, with the exception of providing internationally adopted standards for aircraft emissions and logistics measures of transport management. The reduction of emissions and environment pollution caused by air transport is regulated by Directive 2002/30/EC on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports. Increased environment pollution is expected mainly in the area of Portorož Airport, where an additional mitigation measure of purchasing and changing the intended use of buildings for which the excess of legally prescribed noise pollution was established is possible. A variant mitigation measure to reduce the impact of Portorož Airport on the increased level of noise pollution in the environment is the provision of multimodal transport connections to other airports in the wider vicinity (Ljubljana, Trieste, Rijeka, Pula), where the capacity of passenger and goods transport is already provided in the existing state.
1c	Measure Ro.12 (Motorway network around Ljubljana): the reconstruction of a greater number of areas will be necessary. The measure is important for noise protection, since noise pollution in the environment from the national motorway network in the existing state is highest in the area of the northern Ljubljana bypass and also along the remaining part of the Ljubljana motorway ring. In addition to legislative measures, it is estimated that a shift of transit goods transport from the Ljubljana northern bypass will be necessary, while in the Ljubljana ring area, the speed limit will have to be adjusted accordingly..
2a–f	–
2g	Measure Ro.12 (Motorway network around Ljubljana): the reconstruction of a greater number of areas will be necessary. The measure is important for noise protection, since noise pollution in the environment from the national motorway network in the existing state is highest in the area of the northern Ljubljana bypass and also along the remaining part of the Ljubljana motorway ring. In addition to legislative measures, it is estimated that a shift of transit goods transport from the Ljubljana northern bypass will be necessary, while in the Ljubljana ring area, the speed limit will have to be adjusted accordingly.
2h	–
3a	Measure Ro.12 (Motorway network around Ljubljana): the reconstruction of a greater number of areas will be necessary. The measure is important for noise protection, since noise pollution in the environment from the national motorway network in the existing state is highest in the area of the northern Ljubljana bypass and also along the remaining part of the Ljubljana motorway ring. In addition to legislative measures, it is estimated that a shift of transit goods transport from the Ljubljana northern bypass will be necessary, while in the Ljubljana ring area, the speed limit will have to be adjusted accordingly.
3b–4g	–

7. Guidelines and Mitigation measures – Population and material assets

Pursuant to the Resolution on Transport Policy of the Republic of Slovenia (Official Gazette of the Republic of Slovenia, no. 58/06), the Transport Development Strategy of the Republic of Slovenia has to follow the principles of sustainable and balanced regional development, and strive to reduce external transport costs Priority should be given to measures which provide better sustainable mobility in the long run.

When planning transport policy, priority should be given to improving transport connections to less-developed regions (e.g.: sub-objective 2b (Ro.4 measure) and sub-objective 2c (Ro.7), since accessibility to these areas with sub-urban transport cannot be improved.

In spatial planning, special mitigation measures must be also taken into account:

Sub-objectives	Special mitigation measures
1a	–
1b	Measure A.3 – Portorož Airport: measure should be planned only for activities which are shown to have no negative impact on the residential environment (noise), or on the development of tourism at the local level and in the Sečovlje Salt Pans Landscape Park.
1c–4g	–

8. Guidelines and Mitigation Measures – Cultural heritage

The development of transport infrastructure may affect units and areas of cultural heritage, especially in terms of the degradation of landscape features of the surroundings of cultural heritage units, damage to cultural heritage facilities, and the destruction of archaeological remains during the construction of facilities with vibrations which could cause damage to buildings of cultural heritage. To avoid these impacts, the following must be considered:

- Infrastructure corridors should not be placed in areas of cultural heritage as a priority. When integrating transport infrastructure into the environment, upgrading within existing transport corridors has priority over new construction..
- Prior to the spatial placement of transport infrastructure, it is necessary to conduct extensive preliminary archaeological research and consider its results when integrating the transport infrastructure, and to implement measures to protect archaeological remains.

In spatial planning, special mitigation measures must be also taken into account:

Sub-objectives	Special mitigation measures
1a	In the spatial integration of measures R.3, R8, and Ro.1, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of architectural heritage and archaeological remains must be preserved.
1b	In the spatial integration of measures R.1, R.3, R.6, R.7, R.8, and Ro.1, locations outside units of cultural heritage must be sought. The integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains in particular must be preserved.
1c	In the spatial integration of measures R.1, R.3, R.5, R.8, R.10 and Ro.12, locations outside units of cultural heritage must be sought. The integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains in particular must be preserved.
2a	In the spatial integration of measures R.5, R.8, R.10, Ro.1, Ro.13, Ro.14, Ro.16, Ro.19, and Ro.20, locations outside units of cultural heritage must be sought. The integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains in particular must be preserved.
2b	In the spatial integration of measures Ro.4, Ro.5, Ro.14, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains must be preserved.
2c	In the spatial integration of measures R.3, R.4, Ro.6, Ro.7, Ro.8, Ro.13, Ro.15, U.1, U.2 and U.4, locations outside units of cultural heritage must be sought. The integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains must be preserved.

2d	In the spatial integration of measures Ro.7 and Ro.21, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of architectural heritage and archaeological remains must be preserved.
2e	In the spatial integration of measure Ro.9, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains must be preserved.
2f	In the spatial integration of measures Ro.17, Ro.18 and Ro.9, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains must be preserved.
2g	In the spatial integration of measures R.1, R.3, R.5, Ro.10, Ro.11, Ro.12, Ro.13, Ro.14 Ro.19, U.1, U.2, Ro.11, Ro.15, and U.4 – railway, locations outside units of cultural heritage must be sought. in particular, the integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains.
2h	In the spatial integration of measures Ro.7, Ro.9, Ro.10, Ro.11, Ro.19, Ro.20 and Ro.21, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains must be preserved.
3a	In the spatial integration of measures R.1, R.3, R.5, Ro.12, U.1, U.2 and U.4 – railway, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains must be preserved.
3b	In the spatial integration of measures R.8, R.10, and Ro.16, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of settlement heritage and archaeological remains must be preserved.
3c	In the spatial integration of measures R.1 and Ro.17, locations outside units of cultural heritage must be sought. In particular, the integrity and features of cultural landscapes, areas of influence of architectural heritage and archaeological remains must be preserved.
4a-g	-

9. Guidelines and Mitigation Measures - Landscape

To ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image, the following guidelines must be pursued:

- Infrastructure corridors should not be integrated into exceptional landscapes or landscapes with distinctive features at the national level.
- When integrating transport infrastructure into the environment, upgrading within the existing transport corridor has priority over new construction.
- Proper technical measures must be applied to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.

In spatial planning, special mitigation measures must be also taken into account:

Sub-objectives	Special mitigation measures
1.a	In the spatial integration of measures R.3, R.8, and Ro.1, locations outside exceptional landscapes and landscape areas with distinctive features at the national level must be sought (R.3: Bitnje, the Lipnica Valley and Dobrave; Ro.1: Haloze).
1b	In the spatial integration of measures R.3, R.8, R.10, Ro.1, and A.3, locations outside exceptional landscapes and landscape areas with distinctive features at the national level must be sought (R.3: Bitnje, the Lipnica Valley and Dobrave; Ro.1: Haloze).
1c	In the spatial integration of measures R.1, R.3, and Ro.12, locations outside exceptional landscapes and landscape areas with distinctive features must be sought (R.1: the Ljubljana Marshes, the Planina Field, the Brkini Hills with the Vreme Valley, Črni Kal; R.3: Bitnje, the Lipnica Valley and Dobrave; Ro.12: Barje, the Planina Field). Proper technical measures must be applied to measures R.1, R.3, R.8, R.10 and Ro.12 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
2.a	In the spatial integration of measures Ro.1, Ro.13 and Ro.14, locations outside exceptional landscapes and landscape areas with distinctive features at the national level must be sought (Ro.1: Haloze, Ro.13: Volčji potok, Ro.14: Brunk). Proper technical measures must be applied to measures Ro.1, R.8, R.10, Ro.13, Ro.14, Ro.16, Ro.19 and Ro.20 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
2b	In the spatial integration of Ro.14 measures, locations outside exceptional landscapes and landscape areas with distinctive features must be sought (Ro.14: Brunk). Proper technical measures must be applied to measures Ro.4, Ro.5, and Ro.14 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.

2c	In the spatial integration of Ro.6, Ro.7, and Ro.13 measures, locations outside exceptional landscapes and landscape areas with distinctive features must be sought (Ro.14: Brunk). Proper technical measures must be applied to measures R.3, Ro.6, Ro.7, Ro.8, Ro.13, U.2, U.4 – railway to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
2d	Proper technical measures must be applied to measures Ro.7 and Ro.21 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
2e	Proper technical measures must be applied to measures Ro.9 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
2f	In the spatial integration of measure Ro.18, locations outside the exceptional landscape Prem–Suhorje must be sought. Proper technical measures must be applied to measures Ro.17 and Ro.18 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
2g	In the spatial integration of measures R.1, Ro.11, Ro.12, Ro.13, Ro.19, U.2 and U.4 – railway, locations outside exceptional landscapes and landscape areas with distinctive features must be sought, especially the Marshes (R.1, Ro.11, Ro.12), the Planina Plain (R.1, Ro.12), the Brkini Hills with the Vreme Valley (R.1), Črni Kal (R.1), Bitnje (R.3), the Lipnica Valley (R.3), Dobrave (R.3), Brunk (Ro.14), the Šmarna gora Hill (Ro.13, Ro.15, U.2 and U.4), Volčji Potok (Ro.13, U.1) and Smlednik (Ro.15, U.1, U.2, and U.4). Proper technical measures must be applied to measures R.1, R.3, Ro.10, Ro.11, Ro.12, Ro.13, Ro.14, Ro.19, U.2 and U.4 – railway to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
2h	In the spatial integration of measures, locations outside exceptional landscapes and landscape areas with distinctive features must be sought, especially Labinje and Drežnica (Ro.7). Proper technical measures must be applied to measures Ro.7, Ro.9, Ro.10, Ro.11, Ro.19, Ro.20, Ro.21 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
3a	In the spatial integration of measures R.1, R.3, Ro.12, U.1, U.2 and U.4, locations outside exceptional landscapes and landscape areas with distinctive features must be sought, especially Labinje and Drežnica (Ro.7). Proper technical measures must be applied to measures R.1, R.3, Ro.12, U.2 and U.4 – railway to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
3b	In the spatial integration of measures R.8, R.10 and Ro.16, locations outside exceptional landscapes (the Kalvarija Hill–the Piramida Hill) and landscape areas with distinctive features (the Jeruzalemske gorice Hills) must be sought. Proper technical measures must be applied to measures R.8, R.10 and Ro.16 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
3c	In the spatial integration of R.1 measure, locations outside exceptional landscapes and landscape areas with distinctive features must be sought: the Marshes, the Planina Plain, the Brkini Hills with the Vreme Valley, Črni Kal. Proper technical measures must be applied to measures R.1 and Ro.17 to provide a high-quality landscape image, especially in the case of activities in naturally preserved and culturally rich landscape units.
4a–g	-

10. Explanation of observing individual mitigation measures

The preparation of the Environmental Report was conducted parallel to the drafting of the Transport Development Strategy of the Republic of Slovenia. Based on the Environmental Report, twelve new transport measures were drafted in all, while three existing measures were amended. The latter also include measures which require additional verification that they attain an individual sub-objective or amendment to measures in the Transport Development Strategy of the Republic of Slovenia.

In October 2014, based on the mitigation measures of the Environmental Report, the Strategy was amended in the following transport measures:

- Measures for road infrastructure: Ro.44, Ro.45, Ro.46, Ro.47, Ro.35, Ro.48;
- Measures for railway infrastructure: R.41, R.42, R.43, R.44;
- Measures for urban infrastructure: U.40, U.41;
- Measures for water-borne transport: M.35;
- Measures for air transport: A.3;
- R.7, R.8, R.9 and R.10 measures are included in the sub-objective 2.a
- measure R.3 was removed from sub-objective 2.b;
- measure Ro.7 is included in sub-objective 2.d.

11. Explanation on observing comments after public consultation

After the public display, positions on comments were prepared in terms of environmental protection (Final report on the public display, Aquarius, d.o.o., Ljubljana, May 2015).

After the public discussion, the text and transport measures of the Transport Development Strategy of the Republic of Slovenia were amended. The authors of the Environmental Report examined all the amended transport measures and found that measures Ro.13 and Ro.17 must be re-assessed in terms of their environmental impacts, since they have been significantly changed. Three new measures relating to water-borne transport were also added to the transport measures. The new measures were also additionally assessed.

In regard to the comments on railway noise at the Zalog marshalling yard, the Environmental Report sections 8.1.6 and 10.6.2 were amended, while the Strategy was amended in measure R.39.

The data on the existing state of air quality regarding ozone were amended in Chapter 5.1.2. In Chapter 10.2, the mitigation measures regarding air quality in city centres were amended with a proposal to implement low emission zones, and thus measure Ro.45 was also amended.

Z vidika vpliva na okolje so bistveno dopolnjeni ti prometni ukrepi v Strategiji:

- R.39 Reduction of negative environmental impacts;
- Ro.33 Environmental protection and road safety;
- Ro.45 Reduction of pollutant emissions;
- U.40 Reduction of pollutant emissions;
- M.6 Establishment of an inland waterway in the international category on the River Sava between Brežice and Obrežje;
- M.35 Reduction of negative impacts on the quality of the sea and inland waters;
- M.36 Determination of navigation categories of the inland waterways in Slovenia inregional categories (I-III) in areas of rivers and lakes with the appropriate conditions;
- Specific mitigation measures are included in measures R.39, Ro.33, U.40, A.2, A.3 and M.35;
- Change of names of measures R.39, Ro.33, U.40 and M.35.

Based on comments, sections 5.1.3 and 8.1.3 of the Strategy – "Climate factors" were amended, namely in relation to adaptation to, and mitigation of, climate change. The amendments were prepared with the aid of documents prepared by the Ministry of the Environment and Spatial Planning and the Biotechnical Faculty in November and December 2014.

In July 2015, the report was amended in Chapter 11 – Monitoring, namely by the indicator to monitor chemical and ecological state of the sea. The amendment was drawn up on the basis of a comment submitted by the Republic of Italy.

10 Conclusion

As a document, the Strategy is the result of a process which ends with its adoption. However, it must be constantly examined and amended.

The measures stipulated by the Strategy address the entire Slovenian transport system and clearly and unambiguously require an accelerated drawing up of individual projects. The Strategy also stipulates the method of project preparation which must be based on actual needs, attain the objectives of economy and sustainability and eliminate problems defined in measures. Naturally, the possibilities of a better and more efficient use of existing capacities must be studied first. Other solutions are sought only if the respective capacities cannot eliminate the problems.

Individual measures require specific documents to be drawn up, since some areas have no clearly defined sub-objectives (e.g. the cycling network, ERTMS, electrification of regional lines). Some sub-programmes or strategies must be prepared to outline the arrangement of individual specific areas in more detail (e.g. alternative fuels).

The realisation of the Strategy must be constantly verified. Indicators are determined for this purpose, which also provide numerous analyses. These must also be implemented by using the national transport model. Thus, it must be constantly updated, while on this basis the Strategy must be amended every five years.

The phase that follows the Strategy is for preparing an implementation plan, which will be a more clear document, since it will define individual projects or sub-programmes, their order or priority, deadlines for implementation, programme operators and financial means needed.

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List of abbreviations

AIS	Automatic Identification System on ships
AADT	Average Annual Daily Traffic
AJPES	Agency of the Republic of Slovenia for Public Legal Records and Related Services
AT	Republic of Austria
BA Corridor	Baltic-Adriatic Core Network Corridor
CEC	Civil engineering company
CEF	Connecting Europe Facility (Regulation (EU) No 1316/2013)
CETRA	Central European Transport Model
CF	Cohesion funds
CNG	Compressed natural gas
CP	Cohesion policy
CRO	Republic of Croatia
DARS	Motorway Company in the Republic of Slovenia
DRI	DRI upravljanje investicij, Družba za razvoj infrastrukture, d.o.o.
DRSI	Slovenian Infrastructure Agency
EC	European Commission
ERDF	European Regional Development Fund
ERTMS/ETCS	European Rail Traffic Management System/Train Control System that enables the interoperability of trains
ESPON	European Observation Network for Territorial Development and Cohesion
EU	European Union
EURO	European emission standards for vehicles
GDP	Gross Domestic Product
HBEFA	Handbook Emission Factors for Road Transport
HU	Republic of Hungary
IPOP	Institute for Spatial Policies
IT	Republic of Italy
ITS/TMS	Intelligent Transport Systems/Transport Management Systems
JAPTI	Public Agency for Entrepreneurship, Internationalisation, Foreign Investments and Technology
LRIT	Long-range identification and tracking of ships
MED Corridor	Mediterranean Core Network Corridor
MNZ	Ministry of the Interior
MPUS	Mandatory public utility service
MzI	Ministry of Infrastructure
MZIKS	Ministry of Education, Science, Culture and Sport
NAPA	North Adriatic Ports Association (Rijeka, Koper, Trieste, Venice)
NSP	National spatial plan
OECD	Organisation for Economic Cooperation and Development
P+R	Park and Ride
PPT	Public passenger transport
PRI	Public railway infrastructure
PRIMOS	National transport model (Slovenia)
PS	Public utility services
RIS	River Information Services
RNE	RailNetEurope (Association of European railway infrastructure management companies)

SafeSeaNet	Vessel traffic monitoring in EU waters
SESAR	Single European Sky Air Traffic Management Research
SMA	Slovenian Maritime Administration
SPSS	Spatial Planning Strategy of Slovenia
SURS	Statistical Office of the Republic of Slovenia.
SŽ	Slovenske železnice
TEN-T	Trans-European Transport Network
TENtec	European Commission's Information System for TEN-T and public access to information regarding
TEU	Twenty-foot equivalent unit (6.1 x 2.44 x 1.33–2.9 metres) used to describe the capacity of container ships
TRANS-TOOLS	Trans-European Transport Model
TSI	Technical Specifications for Interoperability of Railway Systems
UMAR	Institute of Macroeconomic Analysis and Development of the Republic of Slovenia
VAT	Value added tax
VISUM	Software for transport analyses, forecasts and GIS-based data management
VTS	Vessel Traffic Service

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