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HTM Consultancy

Ministry of Transport
Republic of Latvia

Riga and Pieriga Mobility Plan final report

Mobility Plan Riga and Pieriga

Tornu iela 4, III C, office no. 203

Riga, LV-1050

Latvia

Phone: +371 7 223 144

Fax: +371 7 223 830

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approved	J.M.W. Akkerman BSc.	

Mobility Plan Riga and Pieriga
Tornu iela 4, III C, office no. 203
Riga, LV-1050
Latvia
Phone: +371 7 223 144
Fax: +371 7 223 830

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GLOSSARY OF TERMS

bln	Billion	MoT	Ministry of Transport
CBA	Cost-Benefit Analysis	Mtons	Millions of tons
CBD	Central Business District	NMT	Non Motorised Transport
CF	Cohesion Fund (EC)	NTC	Northern Transport Corridor
CSB	Central Statistical Bureau of Latvia	OD	Origin – Destination
CSDD	Road Traffic Safety Directorate	Pkm	Passenger kilometres
DG	Directorate General	PPP	Public Private Partnership
EBRD	European Bank for Reconstruction and Development	PR	Public Relations
EC	European Commission	P+R	Park and Ride
EIA	Environmental Impact Assessment	PIS	Passenger Information System
EIB	European Investment Bank	PT	Public Transport
EIRR	Estimated Internal Rate of Return	PWC	PricewaterhouseCoopers
ENPV	Estimated Netto Present Value	RCC	Riga City Council
EPEC	European PPP expertise centre	Ref	Reference scenario
ERDF	European Reconstruction and Development Fund	RFP	Riga Freeport
EU	European Union	RIX	Riga International Airport
GDP	Gross Domestic Product	RPMP	Riga and Pieriga Mobility Plan
ha	Hectares	RRC	Riga Regional Council
IMF	International Monetary Fund	RS	Ltd 'Rigas Satiksme'
ITS	Intelligent Transport System	SC	Steering Committee
km	kilometre	SEIA	Strategic Environmental Impact Assessment
Ktons	thousands of tons	SPV	Special Purpose Vehicle
LoS	Level of Service	SWOT	Strengths, Weaknesses, Opportunities, Threats
LSR	Latvian State Roads	TEN-T	Trans-European Networks – Transport
Ltd	limited liability company	ToR	Terms of Reference
MCA	Multi-Criteria Analysis	V/C ratio	Volume/Capacity ratio
MEUR	Millions of Euros	WB	World Bank
mln	Million	WG	Working group
MoF	Ministry of Finance		

1. INTRODUCTION

This document presents the Riga and Pieriga Mobility Plan (RPMP). This introduction describes the objectives for the RPMP, gives an overview of the approach which has been used, describes the process of cooperation with the stakeholders, introduces related study projects and ends with the outline of this report.

1.1. Objectives of the RPMP

The RPMP is meant to create an overall framework in which all existing and new plans for construction and improvement of the traffic and transport system in Riga and Pieriga are evaluated and prioritised. Professional expertise and ideas of the consultant team have been combined with existing plans and information in the development. The plan provides solutions for the traffic and transport problems which the Ministry of Transport of Latvia is facing, contributing to spatial, ecological, economical, social and institutional optimization.

The RPMP has the following overall goal: **'To determine a vision and necessary actions in order to promote unified traffic system development in Riga and Pieriga, thus improving accessibility of the territory'.**

Seven main objectives have been defined for the development of the RPMP. These objectives are based on discussions with stakeholders, expert knowledge of the consultant team, the Inception report (MoT, 2009) for the RPMP development and existing policy documents. The objectives are the high level goals for the development of the RPMP and have been approved by the Steering committee.

RPMP Objectives

1. ***to make effective use of the existing transport system of Riga and Pieriga and prefer soft measures (management, organisation, ITS) over hard measures (infrastructure development) where possible.***
   Explanation: this principle has been applied to arrive to a realistic, effective and efficient RPMP, which establishes an optimal balance between accessibility issues and social, safety and environmental issues;
2. ***develop an efficient, attractive and competitive public transport system, with priority for electric and railway modes.***
   Explanation: the motivation for this objective is to develop a sustainable system providing good accessibility, limiting traffic hindrance, improving traffic safety and reducing environmental burden of traffic. With the priority for electric modes local environmental impact from the transport can be limited;
3. ***to eliminate bottlenecks in the road and street network to create a coherent network, with clear road and street classifications and prioritisation of modes.***
   Explanation: currently, the network has weak and missing links leading to fragmentation and bottlenecks in the traffic flow. With removal of missing links and bottlenecks and with road and street classification the network can be made coherent. Furthermore, with classification and prioritisation the traffic circulation, accessibility and traffic safety can be improved;
4. ***increase the level of road safety, without hampering accessibility.***
   Explanation: at present the traffic safety level in Latvia is low in comparison to other European countries. At the same time, recent years have shown that there is much scope for improvements;
5. ***provide multi modal accessibility to different places.***
   Explanation: multi modal accessibility is necessary to provide optimal choices for trip making and to make the transport system less vulnerable for incidents. Multi modal accessibility can be achieved by providing facilities for all modes in an integrated transport system with sufficient transfer possibilities;

6. ***ensure good and reliable connections between the Riga Freeport, Riga and other national and international (TEN-T) transport infrastructure networks.***
   Explanation: with good connections further economic development is enabled. Furthermore, with sustainable connections the city centre can be relieved from the freight transport burden, dangerous goods in particular;
7. ***ensure good and reliable connections between the Riga international airport, Riga and other main regional centres in a sustainable way.***
   Explanation: With a good and reliable transport system further economic development is enabled. Currently, a proper public transport link between Riga city centre, other regional centres and the Riga international airport is missing.

1.2. Approach for development of the RPMP

The development of the RPMP has been accomplished in six tasks. The approach is presented in figure 1.1. In the first task the current situation has been investigated and analysed. Based on the outcomes the objectives for the RPMP have been defined (task II) and approved by the Steering committee. Simultaneously, the existing EMME traffic model has been extended and updated (task III).

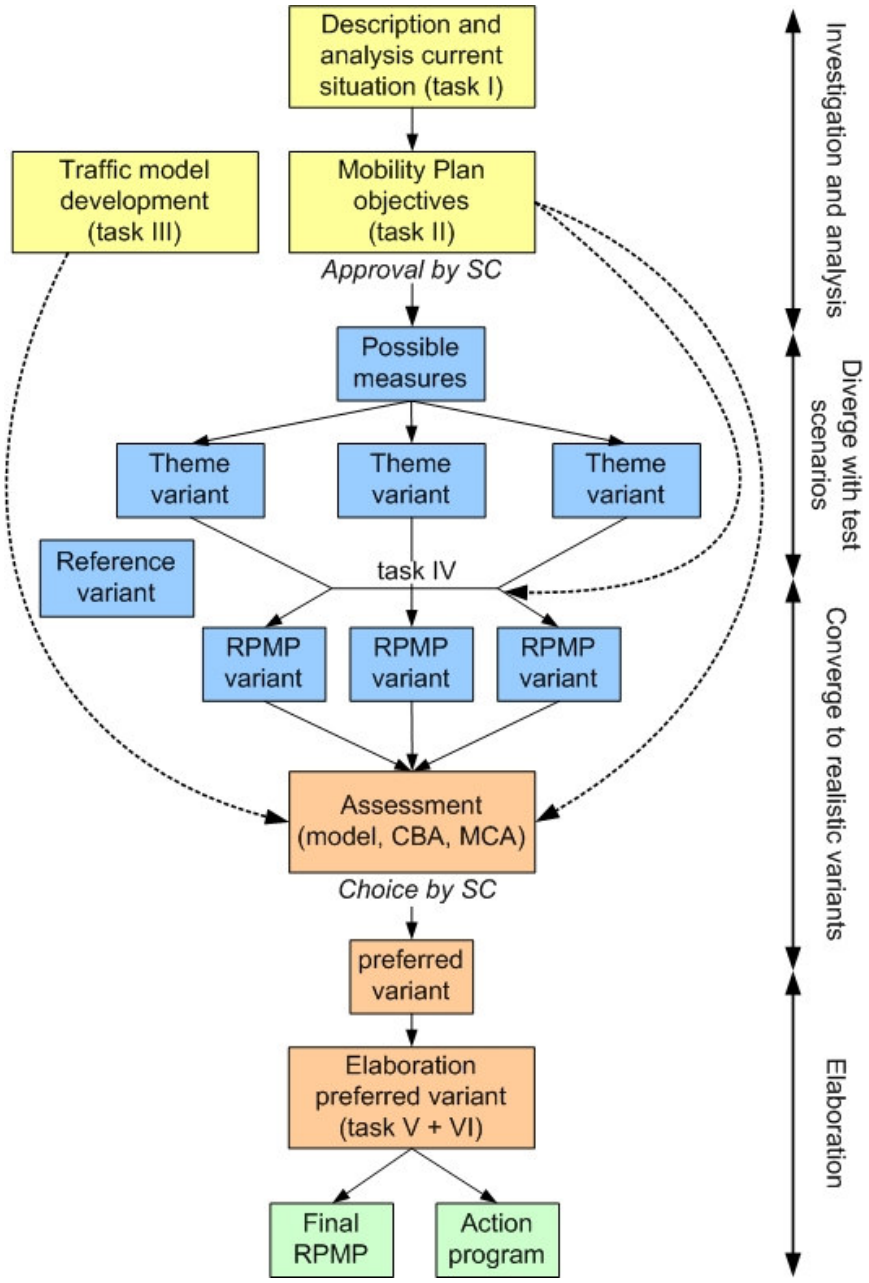
In the fourth task RPMP variants have been developed in several steps. First possible measures and projects were defined, together with the stakeholders, based on the current situation and the objectives. These measures have been used in test scenarios to study the possible effects on mobility in Riga and Pieriga. For the test scenarios so-called theme variants were developed: variants with a focus on either infrastructure development, public transport or liveability[1]. These variants were no realistic variants for the RPMP, but focused on one or several objectives. By modelling these 'extreme' variants the possibilities for Riga and Pieriga were explored. The results were assessed based on aspects related to amongst others economy (costs, congestion), environment and liveability.

In the next step realistic variants (the RPMP variants) have been developed based on the outcomes of the test scenarios and the RPMP objectives. Furthermore, also a reference variant, with all autonomous developments has been prepared as comparison for the RPMP variants. At the end of task IV the three RPMP variants have been assessed with traffic model runs, a cost-benefit analysis (CBA) and a multi criteria analysis (MCA). In the MCA the variants have been scored based on criteria derived from the objectives. The result of the assessment was a recommendation for the choice of the preferred variant.

The SC has chosen variant A, according to the recommendation, as preferred variant. In task V this variant has been elaborated towards a complete description of the RPMP. Furthermore, in task VI an action program for the period 2011 to 2017 has been prepared. Tasks I and II have been described in the first interim report, task III in the second interim report and task IV in the third interim report. These interim reports have been delivered separately to the Ministry of Transport. This final report gives a summary of the interim reports and presents the detailed elaboration and justification of the preferred variant for the RPMP. The action program is delivered as separate report.

[1] Liveability can be described as the quality of life and is concerned amongst others with the quality of space and the built environment. In relation to traffic and transport liveability is influenced by the amount of noise, air pollution, the space dedicated to traffic and traffic safety. Traffic calming is an example of a measure to improve liveability.

figure 1.1. The development of the RPMP



1.3. Process of cooperation

The development of a RPMP is a project with many stakeholders involved. During the development most stakeholders were represented in the Working group (WG) and in the Steering committee (SC) (see table 1.1 and 1.2). The Pieriga municipalities, the main other stakeholders, have been involved via interviews, a workshop and a municipality meeting. Each interim report has been discussed and been approved in the Working group and several extra meetings and workshops have been organized to discuss the contents of the RPMP. The objectives for the RPMP have been approved by the Steering committee in the first meeting of this committee. In the second meeting the Steering committee has chosen the preferred RPMP variant. The Steering committee members were continuously updated on the process by their representatives in the Working group. Tables 1.1 and 1.2 present the composition of the Working group and the Steering committee.

The WG and SC have guided the process of development of the RPMP. Furthermore, during the development many consultations with each of the stakeholders have been used to arrive to a complete, coherent and supported RPMP. Appendix II gives an overview of all meetings and consultations which have been held during the development of the RPMP. The appendix presents only the formal meetings, additionally also many informal meetings and discussion (in Riga, by telephone and by e-mail) have provided input for this plan.

table 1.1. Working group

Name	Organisation	Position
Mrs Mara Tapina	Ministry of Transport	Director of Land Transport Department
Ms Daiga Dolge, Mr Jolants Austrups	Ministry of Transport	Project coordinator
Mr Andis Kublacovs	RCC City Development Department	Head of the Project Management and Development Unit
Mr Janis Lagzdons, Mr Eriks Sulcs	RCC Traffic Department	Head of public transport unit
Mrs Inara Pavlovska	SJSC Latvijas Valsts celi	Head of Strategic planning division
Mr Armands Puzulis	Riga region planning division	Head of spatial planning department
Mr Maris Riekstins	SJSC Latvijas Dzelzcels	Director of development department
Mr Andulis Zidkovs	SJSC Pasazieru vilciens	Chairman of the Board

table 1.2. The Steering committee

Name	Organisation	Position
Chairman of the SC: Mr Anrijs Matiss	Ministry of Transport	State Secretary
Deputy chairman of the SC: Mrs Mara Tapina	Ministry of Transport	Director of Land Transport Department
Mr Aino Salmins	Latvian Association of Local and Regional governments	Counsellor in questions regarding technical problems
Mrs Alda Ermane	Zemgale Planning Region; Public Transport and road development unit	Head of Public Transport and road development unit
Mr Edvins Bartkevics	Riga Planning Region; Development council	Chairman
Mrs Gunita Osite	Jelgava City Council	Head of Administration Development and City planning authority
Mrs Inguna Urtane	Ministry of Regional Development and Local Governments; Spatial Development Department	Director
Mr Janis Miezeris	Riga Planning region	Head of administration
Mr Janis Zilvers	Sigulda Regional Municipal Council	Deputy chairman
Mr Juris Sulcs	Tukuma Regional Municipal Council	Chairman
Mr Normunds Licis	Saulkrastu Regional Municipal Council	Deputy Chairman
Mr Peteris Salkazanovs	Latvian Passenger Carriers Association	Chairman

Name	Organisation	Position
Mr Romualds Razuks	Jurmala City Council	Chairman
Mr Sergejs Dolgopolovs	RCC	Head of the City Development Committee
Mr Uldis Reimanis	Ministry of Transport	Deputy State Secretary

1.4. Additional study projects

During the development period of the RPMP two additional studies were carried out for application of these projects for Cohesion Fund support in the current programming period. These studies are:

- 'development of infrastructure on Krievu Sala for relocation of port activities out of the city centre, assessment of impact on mobility', final version dated March 4, 2010, reference LET109-1/torm/002;
- 'development of Airport Infrastructure of Airport Riga, Assessment of impact on Mobility', final version dated March 4, 2010, reference LET109-1/torm/001.

conclusions Krievu Sala port development

In the first project implementation period (till 2020) only alternative B of the Krievu Sala port development project will be implemented. Alternative B consists of dry bulk handling only which is for 99 % - 100 % done by rail. The least expensive is to use the existing railway bridge in Riga for transportation of the dry-bulk to Russia. Analysis of the bridge throughput capacity indicated there will be no problems to be expected. However, due to the relocation of the port activities, other residential areas are affected by the hindrance of dry-bulk train-transport. This asks for development of a railway circle outside the residential areas in Riga, but has to be seen as long term development at certainly not necessary for the Krievu Sala developments alone.

Since handling of dry-bulk is mainly done by rail, there is very little effect on the road network leading towards Krievu Sala. Due to autonomous developments and the existing street network, the Daugavgrivas street connection to Krievu Sala will be overloaded in the southern direction. In the RPMP the improvement of the connection Daugavgrivas iela - K. Valdemara iela is included as measure.

After restore of the economic situation to the levels of 2007, alternative C which consists of adding general cargo to the location. General cargo is transported mostly by road. The forecasted increase of trucks due to the project is 500 per day. This traffic is affected by the autonomous problems on the Daugavgrivas iela in the southern direction as well and will benefit from the reconstruction measures as described before.

conclusions Airport infrastructure development project

This project consists of a set of measures to improve airside operations at the Riga international Airport such as renewal of runway pavements, aprons, updating to CAT II lighting system for Runway 18, construction of additional taxiways etc. The main purpose of the project is to improve airport safety, operations and environmental impact of the airport. Based on forecasts given in the feasibility study of the project, it will allow Riga International Airport to grow to 6.1 million passengers per year.

In demand forecasts made by the airport it is expected that growth mainly consists of transit passengers. This is in line with the airport development strategy and similar effects have been seen in recent years. As worst-case a scenario of 100 % growth by Origin-Destination passengers has been analysed as well. Model calculations indicate that both scenario's have limited effect on the Riga and Pieriga daily traffic situation. Most problems in 2025 are due to autonomous developments of which this project has a limited share. For the airport, the passenger increase could result in the need to expand the terminal capacity. This capacity could be necessary to enable the airport to function as a hub in the Baltic region.

1.5. Report outline

The content of the report is structured as follows:

- chapter 2 Analysis of the current situation: a short description of the current situation regarding the transport system and its use in Riga and Pieriga. A full description and analysis are given in the reports 'First interim report, description current situation' and 'First interim report, analysis current situation' dated 01-02-2010;
- chapter 3 RPMP variants: a description of the process of variant development, the RPMP variants and their assessment, based on the results of the traffic model, cost-benefit analysis, and multi criteria analysis. A full description of the variant development is given in 'Third interim report, Variants' dated 09-06-2010. A description of the traffic model used in the assessment is given in 'Second interim report, Traffic modelling' dated 12-04-2010;
- chapter 4 RPMP network structure: this chapter presents the network structures for roads/streets, NMT, rail and public transport which are the basis for the RPMP;
- chapter 5 RPMP supporting measures: this chapter presents all supporting measures which complement the RPMP network structure;
- chapter 6 Management of Public transport and traffic infrastructure: this chapter discusses the institutional setting of the RPMP and presents recommendations for improvements;
- chapter 7 Financial sources: this chapter discusses the possibilities for financing the RPMP.

All interim reports, referred to above, have been published on the website of the MoT.

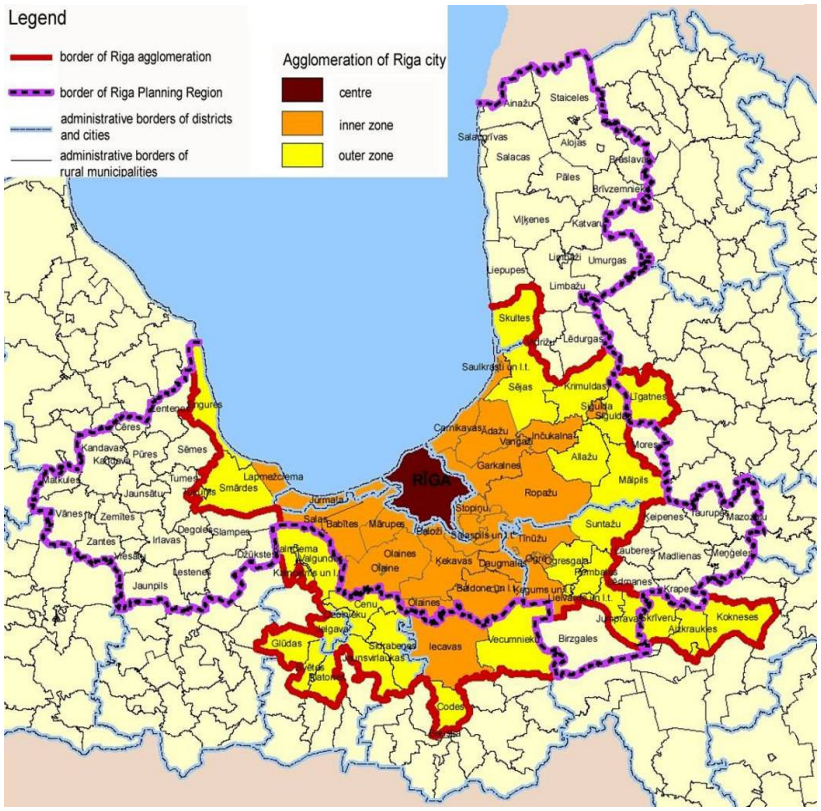
2. ANALYSIS CURRENT SITUATION

This chapter gives a short introduction to the current transport system and its context. The first section starts with a description of the study area. Sections 2 and 3 continue with a description of the social-economic context and the policy framework. Sections 4 and 5 give a summary of the analysis of the supply and demand side of the transport system and section 6 presents SWOT analysis for the road, street and rail network and for public transport.

2.1. The study area

The study area for the RPMP and action program consists of the Riga and Pieriga area. They form the Riga agglomeration territory as shown in figure 2.1 with a size of 6,984 km². The text box at the end of this section lists the municipalities and cities which are part of the Riga agglomeration. It should be noted that the area of Riga agglomeration is somewhat arbitrary. It is based on the interrelationship between Riga and the outer territories. Latvia is divided into five planning regions (Riga, Kurzeme, Zemgale, Vidzeme and Latgale regions). Of these five regions, Kurzeme, Zemgale and Vidzeme border on the Riga region and have a direct relation to the RPMP. These three regions are also partly overlapping the Riga agglomeration.

figure 2.1. Overview of the agglomeration of Riga City



Source: Spatial Plan of Riga City 2006 – 2018

Municipalities within the Riga agglomeration

Local municipalities
Engure district
Tukums district
Jelgava district
Ozolnieki district
Bauska district
Vecumnieki district
Koknese district
Aizkraukle district
Skriveri district
Lielvarde district
Kegums district
Ogre district
Malpils district
Sigulda district
Krimulda district
Seja district
Limbazi district
Incukalns district
Ropazi district
Kekava district
Baldone district
Iecava district
Babote district
Marupe district
Olaine district
Salaspils district
Stopini district
Ikskile district
Garkalne district
Adazi district
Carnikava district
Saulkrasti district

Cities*
Jelgava
Jurmala
Riga

the network structure

The structure of the road and street network in the Riga agglomeration is radial with the Riga old town being in the centre of the structure. The road and street network is roughly classified into:

- highways and main regional roads;
- city main streets (streets with arterial traffic);
- streets (without arterial traffic);
- sidewalks.

There is also a limited number of dedicated bicycle paths. In Riga tram infrastructure is integrated in the streets. The majority of tram infrastructure is also used as a lane for motorised traffic. In the Spatial plan of Riga (2006-2018) the characteristics for the different road and street classes are described. At present the majority of Highways and City main streets do not meet the proposed characteristics. This is (among others) caused by a lack of space, demand for parking places on main streets in the centre or insufficient financial sources to upgrade existing roads and streets. Figure 2.2 gives an overview of the Riga road and street network.

figure 2.2. Riga road and street network

Source: Description of existing transport situation for the Spatial plan of Riga, 'Imink', Ltd.

The following main State level motor roads intersect the Riga region: A1 Riga (Baltezers) - Estonian border (Ainazi), A2 Riga - Sigulda - Estonian border (Veclaicene), A3 Inchukalns - Valmiera - Estonian border (Valka), A4 Riga bypass (Baltezers - Saulkalne), A5 Riga bypass (Salaspils - Babite), A6 Riga - Daugavpils - Kraslava - Belarus border (Paternieki), A7 Riga - Bauska - Lithuania border (Grenctale), A8 Riga - Jelgava - Lithuania border (Meitene), A9 Riga (Skulte) - Liepaja and A10 Riga-Ventspils.

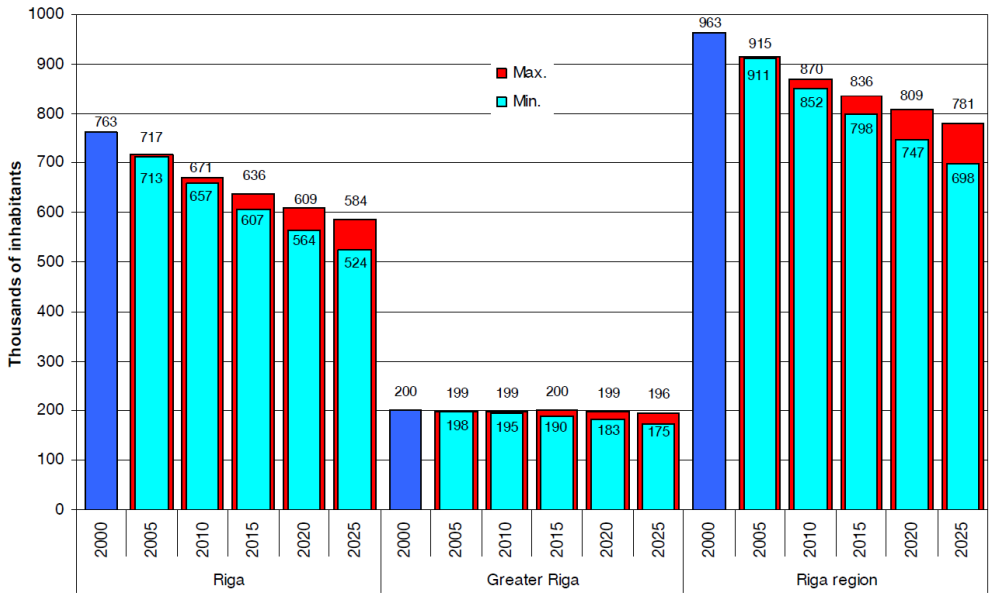
2.2. Socio-economic characteristics

population

The Riga agglomeration currently has a total of approximately one million inhabitants (almost 50 % of the total population of Latvia). Of this population around two third inhabits the city of Riga. In the last 20 years the population of Riga decreased by more than 20 %. The total Latvian population gradually decreased by 15 %. In Pieriga (excluding Riga) the population decreased until 1999 and has been increasing since 2000. This is mainly due to inhabitants of Riga city moving to Pieriga, inhabitants of other regions moving to Riga region and development of new residential areas outside Riga city. The population increase in Pieriga is located in the municipalities near Riga. In the periphery of Pieriga the population is stable or decreasing.

Figure 2.3 presents the expected changes in population until 2025. For both Riga and the Riga region the decrease in population is expected to continue. For Pieriga (noted as Greater Riga) a consolidation or small decrease is foreseen. However, one may notice that the actual situation in regard to the population number in Riga (713,000 in 2009) shows less decrease than forecasted in this figure.

figure 2.3. Expected changes in population numbers until 2025



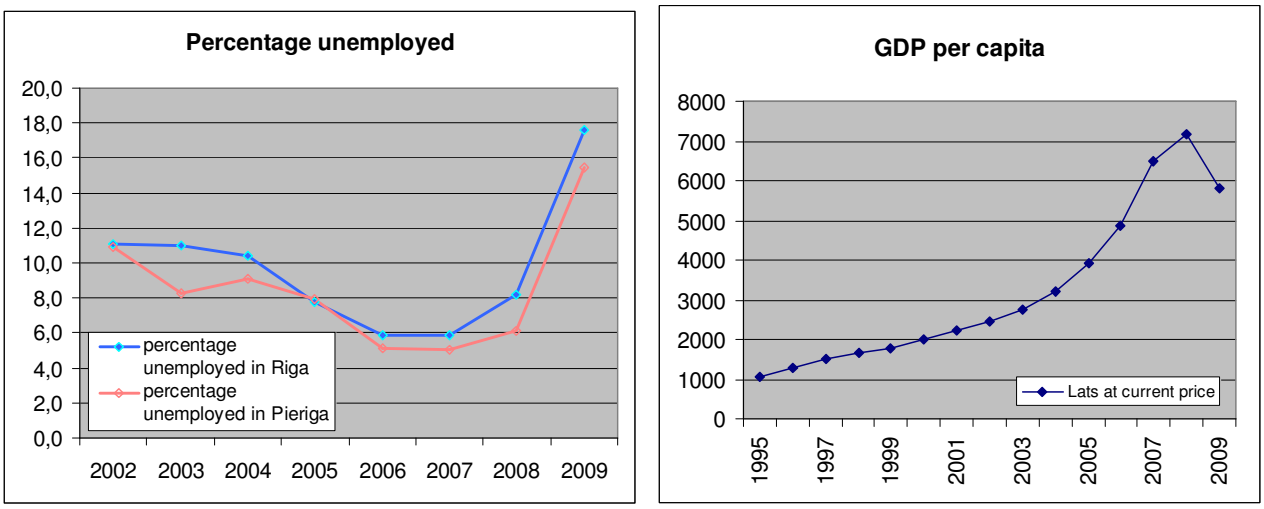
Source: Analysis of Spatial Planning Documents of Riga City and Riga Region within the Context of Traffic Development and the Northern Corridor, Metrum Ltd., 2006

employment

Since 2002 there was a heavy decline in the percentage of unemployed (of the active population) in Riga and Pieriga. However, due to the economic crisis in 2008 there was again a large increase in the percentage of unemployed workers (figure 2.4). The increase in unemployed workers resulted in a clear decrease of traffic flows in the city and region. The figure also shows the development of gross domestic product (GDP) per capita in Latvia. The GDP shows a sharp increase till 2007. The increase in GDP

is clearly tempered in 2008. However, despite the recent downfall, employment is expected to increase within the city limits.

figure 2.4. Development of unemployment in Riga and Pieriga and GDP per capita in Latvia



Source: CSB, http://data.csb.gov.lv.

car fleet

In the past decade car ownership in Latvia (in cars/1000 inhabitants) has grown by 200 % between 1998 and 2008 and has reached 360 privately owned cars/1000 inhabitants in 2008. With an average of 2.49 persons per household, this comes down to around 0.9 car per household. The growth of Latvian's car ownership follows the same growth path as Latvian's GDP per inhabitant in the same period. In 2008 the growth seems to slow down, due to the current economic crisis. However, this does not imply that the growth has come to an end.

It is expected that the saturation level for Latvia lies somewhere between 600-700 (registered) cars per 1000 inhabitants. Compared to other European countries the saturation level is in line with Belgium or the Netherlands, but lower than for example Germany or France. This is due to the fact that Latvia's population is strongly urbanised, half of the Latvian population lives in the Riga agglomeration. The saturation level in a highly urbanised area is usually lower than in less urbanised areas.

Currently, the increase of the unemployed population and the tempering of the GDP and car ownership contribute to a decrease in the traffic flows in Riga and Pieriga. However, with rising car ownership traffic flows are expected to increase in the near future.

2.3. The policy framework

The authorities of Riga and Pieriga have developed many policy documents and initiated many studies on improvement of the situation of traffic and transport.

For Riga City three main policy and planning documents have been made: the long-term vision document 'Riga Long-term Development Strategy till the year 2025', the 'Riga Development Program 2006-2012', and the longer term zoning plan 'Spatial Plan of Riga 2006-2018'. The Riga Development Program 2006-2012 contains a detailed description of the current situation in Riga from sector angle and specification of the objectives to be undertaken pursuant to the long-term development strategy of the city, as well as the programmes and projects designed to further develop the social and economical development of Riga. 'Spatial Plan of Riga 2006-2018' determines the land use policy on the entire city scale. The Riga Long-term Development Strategy till the year 2025 is an all embracing document setting the development visions of the city, defining the interests of the city and its development priorities

and goals, the basic concepts of spatial planning as well as the strategy implementation supervision model.

On regional level the 'Development Programme of Riga Region 2005-2011', the 'Spatial Development Plan of Riga Region' and the 'Riga County Territorial Plan 2007-2019' have been developed. The Development Programme of Riga Region 2005-2011 sets convenient international and local accessibility as the most direct goal. The Spatial Development Plan of Riga Region (approved in 2007) has a scope of 20 years and determines the spatial planning development directions and methods for Riga planning region. The Riga County Territorial Plan 2007-2019 is a wider scale regional plan. The hierarchy of the planning documents is indicated in the laws on territorial planning and on regional development.

2.4. Analysis of the supply side of the transport system

A thorough analysis has been made of the infrastructure supply, plans and developments in the first phase of the development of the RPMP. This section presents conclusions on the main bottlenecks on the supply side of the transport system.

lack of hierarchy and missing links

The road and street structure in the Riga agglomeration has historically been developed and formed around the three major crossings of the Daugava River (Vansu, Akmens and Salu bridges). With the improvement of the economical situation over the years the car ownership and freight transport increased. As a result of this development parts of the road and street network in the Riga agglomeration became heavily used by local traffic as well as transit traffic. A hierarchical road and street network for separating local from transit traffic, and passenger from freight traffic has not been created. Consequently, transit (freight) traffic is passing the Riga historical centre, since there is no adequate alternative available.

Another issue of lack of road hierarchy is related to traffic safety. In Riga no clear distinction is made between streets for (through) traffic and streets for accessing properties and activities. As a result, function, design and usage of streets do often not match. In the grid system of the city centre a form of hierarchy is established by means of a one way system. Although this system helps to improve traffic circulation, it also leads to extra vehicle kilometres. It should be noted though that possibilities to change the transport system in the city centre are limited, since the area is on the UNESCO World Heritage list.

The major road and street network in Riga is suffering from fragmentation and some supply side bottlenecks:

- highways are not directly connected to each other and to the main city arterials;
- not all city main streets are adequately equipped;
- the number of crossings of the railway circle around the centre and river crossings is limited, leading to confinement of network parts and bottlenecks at the available crossings;
- there is no complete ring structure within Riga to divert transit traffic from the Riga historical centre.

Network development is hindered by physical constraints, like the UNESCO listed city centre, the railway circle around the centre, the limited number of river crossings that lie in each others vicinity, and the lack of publicly owned space to make a direct highway connection between the west- and the East bank.

The A4-A5 connection can be seen as a ring structure in Pieriga. A bottleneck in this connection is the dam at the Riga Hydropower station which has a very limited traffic flow capacity and does not provide a logical, direct connection. Furthermore, this highway ring is not connected on the northern side. This problem is part of one of the main problems in Pieriga and Riga: the limited number of crossings of the river Daugava.

In Pieriga the main roads do not provide fast connections and their design invokes all kind of traffic safety problems. Most safety problems are related to substantial differences in travel speed. They lack measures like slip roads and parallel roads for local access, protected junctions for motorised traffic and crossings for non-motorised transport, grade-separated railway crossings, and grade-separated interchanges. Also, they often lack lanes for overtaking, reducing their capacity (like the A4 and the A5). Furthermore, despite all efforts the maintenance backlog is increasing.

Daugava crossings
Both Riga and Pieriga are divided by the Daugava River with only few connections between the two banks. Until the end of 2008 within the city of Riga there were only four connections over the Daugava River, among which one railway connection. Recently the Dienvidu (Southern) bridge was realized as the fifth connection. This bridge is already in use, but a large part of the access streets is still under construction. In Pieriga (outside Riga) cross river connections are made by the dam in the Riga bypass A5, the dam at Kegums and the dam at Aizkraukle.

The capacity of the bridges is currently not a real bottleneck. However, the location of the bridges within the traffic structure and more specifically the intersections at both sides of the bridges are serious bottlenecks for the traffic flow. On the eastern bank the Vansu, Akmens and Salu bridges have their end in or at the borders of the historical centre. Due to the lack of bridges in a larger ring around the city centre and in Pieriga all traffic is routed through the centre to and from the bridges. Around the old town there is no space to make direct connections for all traffic directions and the distance between junctions is limited. This results in large traffic flows around the old town and the development of congestion and blocking back effects around the intersections.

This might well be one explanation for the fragmented network existing at present. However, with a proper road and street hierarchy, reinforced by traffic lights, turn prohibitions and eventually reconstruction, it should be possible to get road usage more in line with the functions desired, and to establish basic routes between major origins and destinations. This might lead to a lesser impact of the supply bottlenecks existing.

airport and port connections
The port and airport of Riga have grown substantially in recent years and further growth is expected. This leads to an increase in passenger (airport) and freight traffic (sea port) flows. The connections between the port and airport on one side and the Riga city centre and the hinterland on the other are insufficient. Especially, the connections to the public transport network are missing. Furthermore, most freight routes for transport to destinations outside Riga lead through the city centre of Riga. Solutions lie in the provision of adequate infrastructure.

network overlap and competition
In several parts of Riga and Pieriga there is overlap between the network for bus, trolleybus, tram and minibus. These networks are developed and operated separately from each other. The result is a very dense network within the city centre, which actually provides more PT lines than necessary. On the other hand, outside the city centre the networks spread out, containing missing links as well as parallelism.

The train network facilitates (mainly) inter-city traffic in the Riga agglomeration. However the competition with other public transport modes (like regional buses) and the private car is increasing significantly. The bus services are more flexible than the passenger rail. The train is losing its passenger share due to a lack of demand-oriented services (frequency, speed, passenger information etcetera), bad accessibility of the stations and the lack of a feeder role by other public transport modes.

2.5. Analysis demand side of the transport system

The transport issues Riga and Pieriga are facing, are very challenging. From a supply side point of view, the wishes are to extend the road and street network around Riga. At the same time extension of the road and street network will lead to new activities in the vicinity of the new infrastructure. These new sites will become car dependent if the PT network is lacking behind.
The demand for infrastructure will remain high as trip making will not decrease. The challenge is to shift part of this mobility to more sustainable modes. By far the most sustainable modes are NMT. Although weather conditions during half of the year are not very favourable, cycling could become a substantial mode for mandatory trip making.

As not all residents of Riga and Pieriga can benefit from new infrastructure, equity and social justice might become important issues to address. Studies can be conducted on how to take care of specific demand for mobility not facilitated by major infrastructure investments.

2.6. SWOT analyses

Based on analysis of the supply and the demand side of the current transport system in Riga and Pieriga SWOT analyses have been conducted for road, street and rail infrastructure and for public transport. Tables 2.1 and 2.2 summarize the results.

table 2.1. SWOT analysis of road, street and rail infrastructure

SWOT analysis of road, street and rail infrastructure	
Strengths	1. The old city still has a street pattern and dimensions that reinforce the historic and cultural qualities. (Although this has by some sources been described as a weakness in the past); 2. The Southern (Dienvidu) bridge will lead to extra capacity for through and long distance traffic that does not longer strongly interfere with local traffic; 3. The marine passenger terminal and the railway station/bus station are close to the old town and the CBD, and these sites are in principle capable of transferring a lot of passengers without giving too much traffic impact problems in the area; 4. Most arterials at the entrances of Riga have reserve capacity and, albeit physical barriers, do not have a strong impact on liveability in the residential areas; 5. Riga has a well developed PT network with high frequencies, with almost all inhabitants and employees in 5 minutes vicinity of a PT stop. This system has been highly beneficiary for the levels of service on roads and streets; 6. Latvia has a Public Transport tradition which goes back into the Soviet time. As a result the Pieriga region has train infrastructure with train stations and is served by transit busses which stop in several villages or small towns.
Weaknesses	1. The bridges Vansu and Akmens concentrate (through) traffic in and around the centre and the East bank, which leads to congestion, traffic unsafe, extra vehicle kilometres, barriers and substantial environmental impact; 2. Transit traffic is using the streets in and around the Historical Centre of Riga since there is no by-pass like the planned Northern Transport Corridor available in the Riga territory at present time. Transit traffic prefers routes through Riga city centre over the available A4 by-pass; 3. Due to the economic situation the budget for public transport outside Riga has decreased. As a result many PT-lines in rural areas have been cancelled or frequencies were lowered dramatically; 4. The railway loop has lead to a limited number of street crossings that appear as bottlenecks in peak periods. Reducing these bottlenecks will require considerable capital investments; 5. The dense grid system in the CBD has an adverse impact on liveability, by allowing motorized traffic to drive everywhere. The one-way system has limited reach to control this. The UNESCO World Heritage listing limits possibilities for redesigning the traffic space;

	6. There is no strict road and street hierarchy reinforced by different designs, resulting in adverse effects on liveability and traffic safety. Also the absence of lighting on several strategic locations is reducing traffic safety; 7. The network of arterial streets is still incomplete and under development, and therefore failing to distract through traffic from the centre and residential areas; 8. Most state road stretches in the Riga and Pieriga region have some weak points regarding traffic safety, like access of properties via the highway, locations for U-turns and left-turns, zebra crossings, no median barrier, lack of lane marking etcetera. The same refers also to municipal streets; 9. Apart from the central station area there are no big transport hubs in the city and the outskirts. Also, rail and tram/bus/trolleybus are not interconnected, giving more pressure on the street system; 10. Up till now PT has no or hardly any priority at traffic lights. Only some tramlines have some priority measures at traffic lights. Also, since many routes are not diametrical, through passengers are forced to transfer, which worsens PT travel times and competitiveness; 11. There are 18 dedicated PT-lanes on street sections, but none of the PT-lines has a complete dedicated lane in the entire City Centre; 12. Infrastructure for pedestrian movements like street and road passing is limited and often lacking facilities for the disabled; 13. Insufficient knowledge of EU-financing regulations together with insufficient municipal planning documents has lead to missing EU-subsides for the construction of cycle roads in Pieriga; 14. The maintenance level of up to 40 % of the road and street infrastructure is classified as (very) poor. Due to specific investments in periodical maintenance and reconstruction of roads and streets in the past and next years this percentage is decreasing; 15. The accessibility of the north western port region (West bank Daugava) is limited; the access streets do not have a suitable design for the new envisaged developments; 16. Not all new development areas in the north western port region are connected to the rail network; 17. The only route for rail cargo from the port region to the East bank goes via the city centre of Riga, resulting in hindrance and external safety issues.
Opportunities	1. The railway circle gives possibilities to make multimodal interchanges and together with real estate developments the PT network can be strengthened and the traffic can be better spread and disentangled; 2. The marine passenger terminal and the railway station/bus station are close to the old town and the CBD and are capable of transferring a lot of passengers without giving too much traffic impact problems in the area;. The accessibility for pedestrians of both terminal and station however could be improved. Furthermore the Central Bus Station is located in a narrow place and walking distance towards the train station is to far for quick interchange. Improvement of these connections is possible and will provide a better use of PT; 3. New bridges can be combined with moving car traffic away from the existing bridges (Akmens in particular) and provide opportunities to reclaim the East bank as a valuable city promenade, and even to close the railway circle for interconnecting city sections, secondary centres next to arterial crossings and the marine passenger terminal; 4. The grid system in the CBD can provide parallel safe and attractive cycle routes; 5. The Daugava river is very suitable for water recreation as well as passenger and freight transport north-south and east-west; 6. The further decentralisation of jobs and dwellers might reduce the strong orientation on the city centre, leading to more balanced traffic flow patterns; 7. New infrastructure can be linked to new spatial developments in order to safeguard efficient use of the extra capacity; 8. A more stringent car parking policy can lead to better traffic conditions throughout the city

	centre; 9. The PT network can be enhanced, e.g. by better serving important O-D patterns accompanied with promotion, leading to a modal shift away from the car; 10. With a new railway bridge, together with the street infrastructure linking with the port, freight traffic can be diverted from the city centre; 11. New infra around Riga might strengthen the strategic position of Riga as a main transport hub/gateway city in the European region, leading to a greater budget for the road and street network; 12. investments in railways and surroundings can boost rail as a mode for internal trip making, also reducing car trips; 13. With the right investments in engineering, education and enforcement traffic safety figures can further improve, as evidence from other European countries suggests; 14. With resources derived from economic prosperity measures can be taken to improve the emissions of the vehicle stock; 15. The adverse impact of location of companies and services on the network and the surroundings can be reduced with the help of zoning policy, mobility management, and tax differentiation and alike; 16. To combine road cross river connections of the Northern Transport Corridor with a new rail connection in the Northern part of Riga.
Threats	1. The continuing rise in car ownership and car use might lead to highly oversaturated junctions, gridlocks (in the grid system of the CBD) and illegal parking, causing extensive delay, accessibility problems and inefficient capacity usage (e.g. the bridges); 2. A lack of funds for public transport which already has lead to a decrease in public transport services in the Pieriga region will lead to extra car usage from commuters who live in small towns, villages or rural areas; 3. A location of a possible new river crossing must be chosen carefully to be attractive to drivers in order to achieve the proposed/wanted change in traffic routes. If not chosen carefully there is a chance the existing traffic jams in the City Centre will remain; 4. The connection of the new river crossing to existing infrastructure might lead to new traffic jams at other locations; 5. Too many (new) river crossings might excavate PT when the car mode becomes even more competitive and PTs reaction to reduced demand is reducing frequencies; 6. The promotion of bicycle use might lead to traffic unsafety if drivers are not yet used to bicycles and the infrastructure does not protect the cyclist enough; 7. The further decentralisation of jobs and dwellers will lead to more traffic flow in the outskirts, on relations not serviced by PT, leading to congestion and traffic unsafety. Also, commuting into the centre might rise and the unbalance in PT volumes by direction might grow which could reduce competitiveness; 8. The development of new infrastructure will lead to a bigger maintenance program that will be challenged in situations of shortage of resource; 9. Completion of the outer ring might lead to new settlements far away from the city, causing more commuter traffic and vehicle kilometres; 10. Lack of alternatives might lead too more dangerous cargo being transported via the city centre; 11. Transit freight traffic will increase if the economy of Riga and Latvia is further developing; 12. The transport of cargo by rail is losing competitiveness in comparison to transport by road, leading to an increase of road transport and decrease of accessibility.

table 2.2. SWOT analysis of public transport and rail

SWOT analysis of public transport and rail	
Strengths	1. Riga and Pieriga still have a well developed PT network with high frequencies. In Riga almost all inhabitants and employees live or work in 5 minutes walking vicinity of a PT stop; 2. Inhabitants are used to travel with PT and are well informed about the possibilities of PT; 3. PT has a good punctuality and an acceptable level of comfort. In recent years many investments in (new) rolling stock have been made; 4. Just recently an integrated ticketing system has been deployed, leading to more PT integration;
Weaknesses	1. The old town has a street pattern and street dimensions that make it impossible for regular PT to operate services; 2. The bridges over the Daugava river form a barrier for PT, due to traffic congestion, network restrictions and extra vehicle kilometres. Only one bridge can be used by trams and one by train; 3. Apart from the central station area there are no big transport hubs in the city and the outskirts; 4. There is no hierarchical line structure, consisting of fast lines serving main traffic flows and slower lines with more stops on minor traffic flows, feeding fast lines; 5. Rail and tram/ bus/ trolleybus lines are not interconnected; 6. Up to now PT has no or limited priority at traffic lights, and the number of dedicated lanes is limited; 7. Most routes are not diametrical, which forces passengers to transfer, and which worsens PT travel times and competitiveness; 8. The road and street infrastructure is suffering from a maintenance backlog which has a negative influence on comfort, travel speed and costs of repairs; 9. The number of lines is high, with much parallelism, resulting in less efficient operations; 10. The electric modes have not been developed with the growth of the city in the last decades; 11. As a result from the ticketing system the user is confronted with a less transparent network: especially transfer and choice opportunities are not yet encouraged by the fare system; 12. The railway stations are badly accessible and not integrated in the public transport system; 13. The railway rolling stock is outdated and unattractive.
Opportunities	1. New infrastructure can be linked to new spatial developments in order to safeguard efficient use of the extra capacity; 2. New road and street infrastructure can provide opportunities for more dedicated PT lanes, e.g. for restricting a bridge to PT modes only; 3. The PT line network can be improved by introducing a hierarchical structure, more diametrical lines and interconnection with railways and between PT modes; 4. With relative small investments the electric network can be extended to improve air quality and possibly travel speeds; 5. A more stringent car parking policy can lead to better traffic conditions throughout the city centre. PT can be linked to the parking system; 6. The PT network can be enhanced, e.g. by better serving important O-D patterns, accompanied with promotion, leading to a modal shift away from the car; 7. The adverse impact of location of companies and services on the road and street network and the surroundings can be reduced with the help of zoning policy, mobility management, tax differentiation and alike. PT can play an import role in developing those policies, e.g. by providing a good alternative to the car; 8. Connection of new spatial developments to train stations, improving accessibility of the developments and the use of the passenger rail;

	9. Improvement of accessibility and use of the passenger rail through introduction of intercity trains.
Threats	1. The continuing rise in car ownership and car use might lead to decrease of modal share and volume of PT, which decreases the possibilities for an efficient and high quality routes and lines structure; 2. New bridges might excavate PT when the car mode becomes even more competitive and PTs reaction to reduced demand is reducing frequencies; 3. The further decentralisation of jobs and dwellers will lead to more traffic flows in the out-skirts, on relations that cannot easily be serviced by PT. Also, commuting into the centre might increase the unbalance in PT volumes by direction; 4. Completion of the outer ring might lead to new settlements far away from the city, causing more commuter traffic and vehicle kilometres and less opportunities for competitive PT; 5. Urban sprawl around Riga along other corridors then the railway corridors, reducing the competitiveness of the rail in relation to car traffic.

2.7. Additional information

A complete description of the current situation is given in the report 'First interim report, description current situation' dated 01-02-2010. A complete analysis is given in the report 'First interim report, analysis current situation' dated 01-02-2010.

3. TRANSPORT SYSTEM VARIANTS

This chapter describes the approach and philosophy used for the development of RPMP variants. After the introduction section 3.2 presents the philosophy used for development. Section 3.3 describes the autonomous developments and section 3.4 the basic measures. The three variants are presented and assessed in sections 3.5 to 3.8. The conclusions are given in section 3.9.

3.1. Introduction

In the third task for the development of RPMP four variants have been developed for the structure of the transport system: the reference variant and three realistic variants (the RPMP variants). The variants have been developed in three steps:

- test scenarios: the possibilities for the transport system in Riga and Pieriga have been explored with test scenarios in the transport model;
- autonomous developments[2] (reference scenario): a basic situation for the RPMP has been described based on the current situation combined with infrastructure developments which are currently (2010) being built or contracted as well as demographic and economical trends. These autonomous developments are used as a basis for the RPMP variants (in the so called reference scenario);
- realistic variants: three RPMP variants have been developed based on the RPMP objectives, results of the problem analysis, results of the test scenarios, expert judgement and existing plans and ideas.

The three RPMP variants consist of the autonomous infrastructural developments, added with a basic set of measures that is included in all three variants and additional, distinguishing measures. The three variants represent several main choices which have to be made for the transport system. The RPMP variants have been assessed with a traffic model analysis, a cost-benefit analysis and a multi criteria analysis.

3.2. Main philosophy

The main philosophy for the RPMP is to provide a framework for integrated development of the transport system in Riga and Pieriga. The main philosophy for Riga is to further develop and implement a street hierarchy, along the lines as set out by the Riga City Council. The idea of a hierarchy is that roads and streets are used according to their function. In order to achieve this, the design has to be in accordance with the function, and the network needs to be coherent, to stimulate the right use of the different network links.

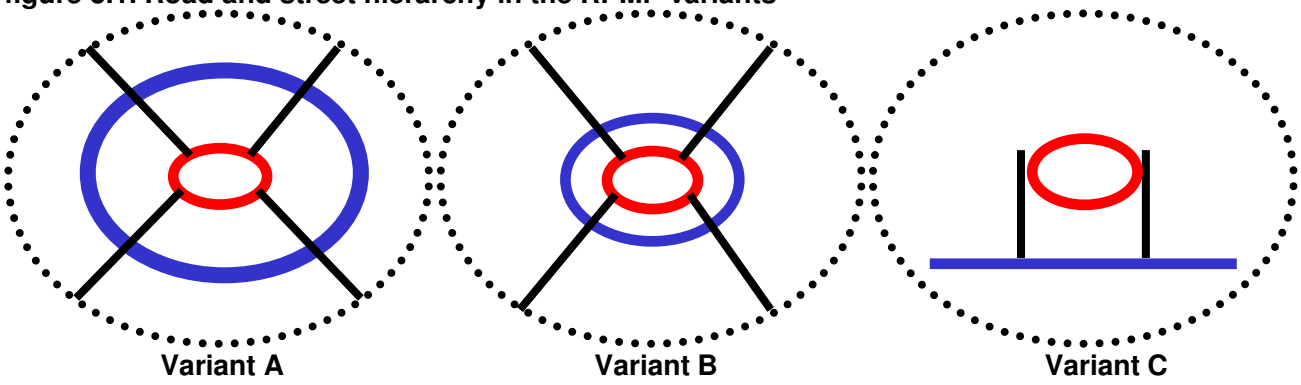
To improve safety and liveability a clear distinction between main roads and streets and local streets should be made. Within the grid of main roads and streets, the local streets can be downgraded. However, the wider the grid and the more extensive the traffic calmed areas within the grid, the more problems arise along the major streets and in the grids as well, since traffic is accumulating there. Hence, there is a trade-off between the extensiveness of traffic calmed areas and the traffic related problems on the main grid.

Based on the philosophy of road hierarchy, the realistic variants have been distinguished in the density of the main roads and streets grid. Figure 3.1 gives a schematic representation of the hierarchy in the three variants. Variants A and B include a complete city centre ring (red) and a city ring (blue) with connections between these rings in all directions (including a new river crossing). Variant B has a more

[2] Autonomous developments are those developments which influence the traffic and transport system and the use of this system, but which occur or are realized independent from the RPMP. The RPMP does include several ongoing projects. These projects are not classified as autonomous developments because inclusion in the RPMP is necessary for finance and/or further implementation.

dense grid than variant A. Variant C only includes one complete ring and has a partial outer ring with limited connections between the two. The variants are further explained in section 3.5.

figure 3.1. Road and street hierarchy in the RPMP variants



In Pieriga road hierarchy is also an important means for reducing traffic problems, like making a clear distinction between roads with and without direct access of houses, farms and estates. However, the main philosophy for Pieriga is based on spatial planning for the region, as in Pieriga transport and spatial planning are even more interlinked. The Riga Planning Region states that the transport infrastructure of the region should be developed in connection with the planned polycentric development of habitation and distribution of work places. In the context of net outmigration and shrinking population, it is considered essential to the sustainable and balanced development of the region to keep critical mass in towns and villages. With this critical mass the living conditions can be maintained and improved, since the location becomes more attractive for employment, services and dwellers. Accessibility is regarded as the key to maintain critical mass. This is the basis for the RPMP philosophy for Pieriga.

In order to avoid widespread low density housing and industrial estates, the Riga Planning Region recommends to concentrate new developments along existing railway lines. This objective is adopted for the RPMP. In the RPMP the railways are chosen as the regional backbone for public transport and spatial development.

3.3. Autonomous developments

The RPMP describes the measures and projects to be realized to arrive to an improved future transport system in Riga and Pieriga. However, this is also influenced by several autonomous developments. Therefore, the RPMP variants are compared to a reference variant which consists of the basic situation in the year 2007 and the autonomous developments between 2007 and 2025.

These autonomous developments consist of socio-economic and demographic developments such as developments in population, employment, car ownership and GDP. A summary of these aspects is given in table 3.1. Furthermore, also the projects and developments which are already contracted or being constructed are seen as autonomous developments. These projects are listed in table 3.2 and shown in figure 3.2. The autonomous developments give the basic situation for the RPMP.

table 3.1. Socio-economic autonomous developments

variable	2007			2025		
	Latvia	Riga	Pieriga	Latvia	Riga	Pieriga
Population	2,296,699	722,232	219,940	2,234,733	704,170	220,000
Change (%)	-	-	-	- 2.7 %	- 2.5 %	0.0 %
Employment	1,031,466	409,801	63,334	1,056,686	424,200	65,600
Change (%)	-	-	-	2.4 %	3.5 %	3.6 %
Car ownership (% change)	-	-	-	59.8 %	59.8 %	59.8 %

Source: Data delivered by Riga Geometrs (2009), plus adaptations based on discussions with RCC and reference studies

figure 3.2. RPMP reference projects

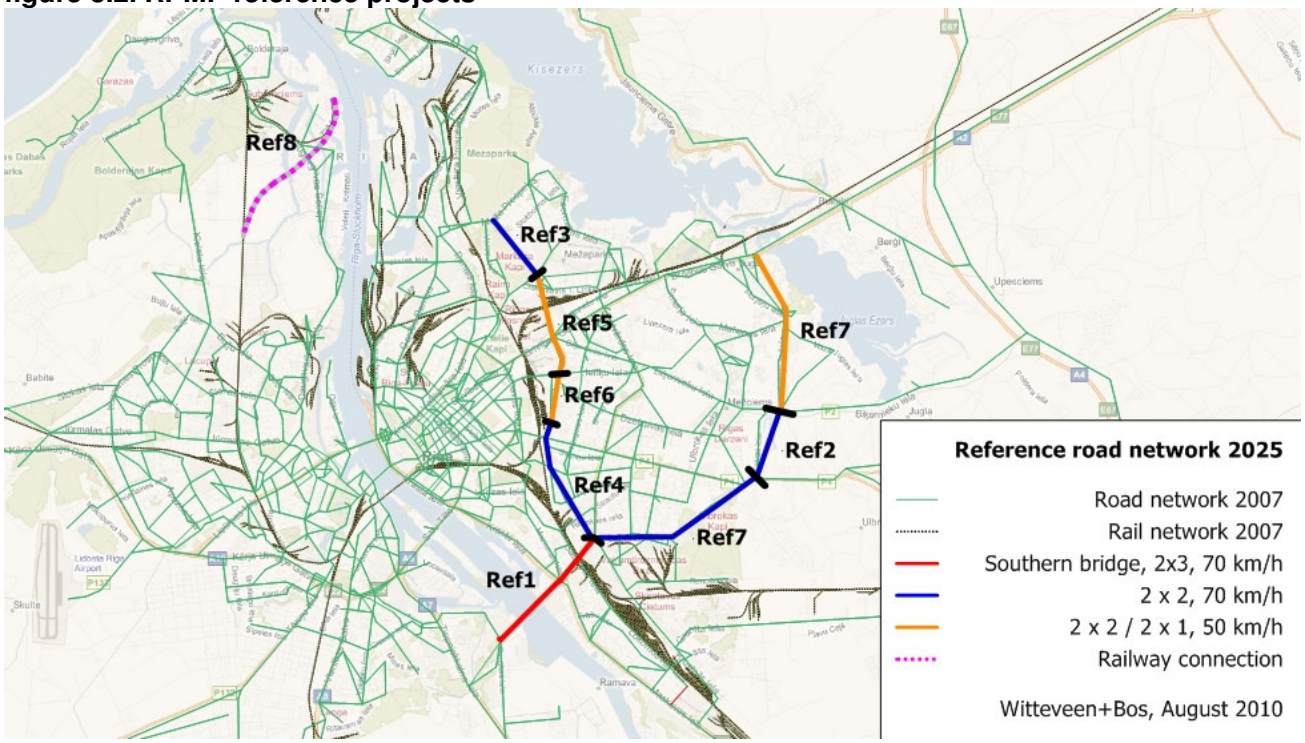


table 3.2. Assured developments in infrastructure till 2025

ID	project	from	to	capacity	speed	remarks[3]
ref1	Southern bridge stage 1 and 2	Slavu iela roundabout	Daugava West bank	2 x 3 lanes	70 km/h	1st stage completed in 2008, 2nd stage to be completed in 2011
ref2	Reconstruction of Juglas iela	Bikernieku iela	Lubanas iela	2 x 2 lanes	70 km/h	to be completed in 2010
ref3	Extension Gustava Zemgala gatve (part of eastern arterial)	Gustava Zemgala gatve	Viestura Prospekts	2 x 2 lanes	70 km/h	road section completed in 2008; construction of fly-over near Gaujas iela in RPMP period; section between Meza prospekts and Viestura to be finished in 2011
ref4	Eastern arterial	Slavu iela	Ieriku iela	2 x 2	50	section Slavu apils – Vie-

[3] During development of the RPMP it became clear that not all reference projects will be finished before 2011 and not for all project finance has been arranged. Therefore, several reference projects (related to the eastern arterial and Southern bridge) have been included in the action program, to be finished during the first implementation period of the RPMP.

ID	project	from	to	capacity	speed	remarks[3]
	(upgrade)			lanes	km/h	talvas iela is completed; design is ready for the section till Ieriku iela; construction in RPMP period
ref5	Eastern arterial (upgrade)	Ieriku iela	Gaujas iela	2 x 2 lanes	70 km/h	completed before 2010
ref6	Eastern arterial (new connection)	Braslas iela	Gustava Zemgala gatve	2 x 2 lanes	50 km/h	completed before 2010
ref7	Slavu/Jugla ring road (upgrade)	Southern bridge	A2	2 x 2/ 2 x 1 lanes	50/70 km/h	reconstruction completed in 2008
ref8	Rail connection	current network	Krievu sala			LDZ project
ref9	E22 Riga (Tinuzi)-Koknese	bypass A4	Tinuzi	2 x 1 lanes	90 km/h	LSR project (not in figure); first part between Riga bypass A4 and Tinuzi has been finished and is therefore a reference project. The part from Tinuzi till Koknese is included in the action program

When confronting the reference measures with the main network structure for the RPMP (chapter 4) this shows that the measures are important links within the RPMP philosophy. Reference projects 3 to 6 are parts of the Eastern arterial, which is part of the Riga city ring in the RPMP structure. Also reference project 1 is part of this city ring. Reference projects 2 and 7 are part of one of the main roads connection to the Riga city ring. Reference project 8 provides a better connection to the port area, which is one of the objectives for the RPMP. The main structure defined for the RPMP builds further on the projects which already are planned or have been started in Riga and Pieriga.

3.4. Basic measures

Traffic modelling, interviews and workshops and analyses of model results, existing data and field surveys have been performed. The results have clearly shown important bottlenecks and drawbacks in the transport system, which can be solved with the proposed measures in the RPMP. Several main measures have been identified, which are at least necessary to improve the traffic and transport situation. These measures form the basic set of measures, which is included in all variants.

The main measures included in the basic set are:

- completion of connections to the Southern bridge (stage 3 from Southern bridge till A7), to improve usage of the bridge. Traffic analysis has shown that in the RPMP period there is no need for further connection between the A7 and A8, independent of the choice for one of the variants;
- downgrade of Akmens bridge (not in variant C), traffic calming in the Riga city centre and the introduction of dedicated streets for public and non-motorized transport, to improve accessibility (avoid transit traffic), liveability and traffic safety;
- introduction of a one-way street system to solve bottlenecks on radials crossing the eastern railway loop;
- construction of a bypass for Valmieras iela, to solve local liveability issues;
- improvement of the connection(s) to the port area by rail and road;
- cohesion fund project E22 section Riga (Tinuzi) - Koknese, to enhance Riga accessibility and solve local transport related problems in the corridor;

- reconstruction of E77/A2, section between the Riga bypass and Senite and of E67/A4 Riga bypass, section between the A6 and the A2, mainly to improve the Via Baltica route;
- construction of the E67/A7 Kekava bypass, to solve local transport related problems and to increase Riga accessibility;
- improvement of the public transport network in Riga and Pieriga, with passenger train, tram and trolleybus as backbone, to increase efficiency and competitiveness with the car mode;
- local traffic safety measures in Riga and Pieriga, to eliminate black spots.

The road measures in Pieriga are based on the already started projects and priorities of Latvian State Roads for Pieriga. This program fits very well with the philosophy of the RPMP for Pieriga (see section 4.2). The listed projects are supposed to have the largest contribution to improvement of the regional accessibility. The public transport measures are based on different analyses to increase efficiency as well as competitiveness.

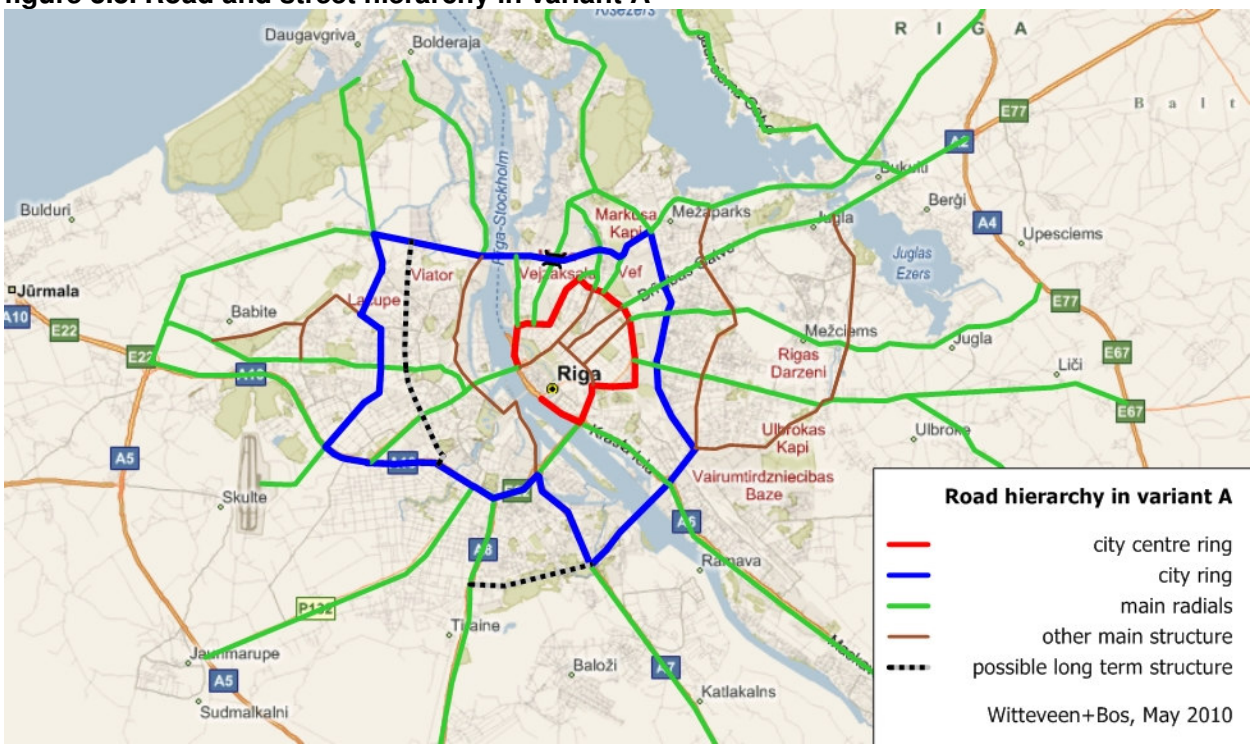
3.5. RPMP variants

The three realistic variants, A, B and C, have been distinguished based on the main road and street hierarchy. In variants A and B the road and street system is complemented with a new river crossing to the north of Vansu bridge. Analysis (third interim report) has shown that there is a very large demand for such a connection and that such a connection is necessary to be able to reduce the amount of traffic in the Riga city centre. Also, it is regarded as imperative for making a new step in improving the transport system, since possibilities for further optimisation of the existing network are limited without a new crossing. A fact sheet with a summary of the analysis is included in appendix I. Variant A foresees a sparser main network, with clear hierarchy and high capacities and speeds. Variant B foresees a denser main network, with more possible routes, but less capacity per route. Variant C does not include any new river crossing. This variant focuses on better use of the Southern bridge and improvements with traffic management on the main routes in the road and street hierarchy. Figures 3.3 to 3.5 present the future hierarchy for each of the three variants. Additional information and figures are given in the third interim report.

The main distinguishing measures in variant A are:

- construction of the complete Northern Transport Corridor (NTC) including a new Daugava crossing, relieving the streets in the historical centre of Riga and accommodating freight traffic to the port and industrial zones in the northern part of city;
- construction of a connection from Jurkalnes iela to Jurmalas gatve as part of the western side of the city ring, also connection both sides of the railway Riga-Jurmala;
- reconstruction of the intersection of Augusta Deglava iela with the Eastern Arterial, providing better connection with the city.

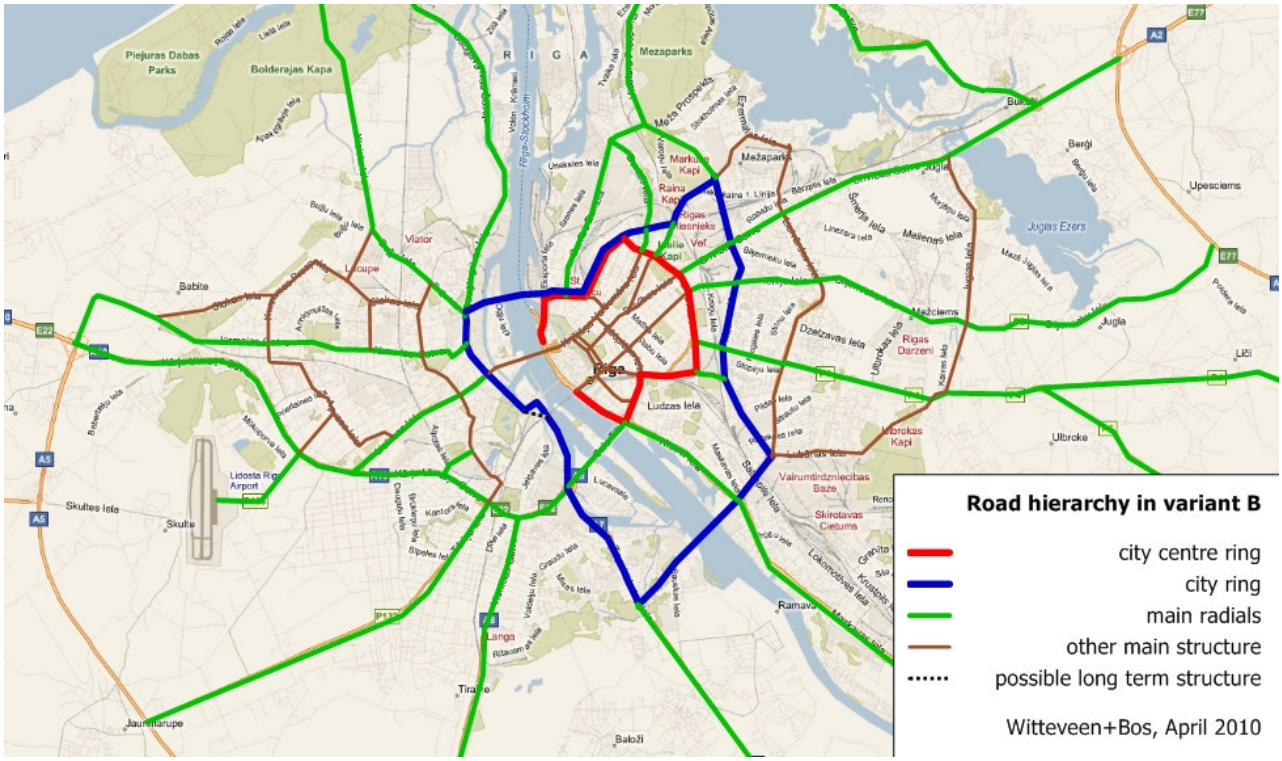
figure 3.3. Road and street hierarchy in variant A



The main distinguishing measures in variant B are:

- construction of the Hanzas bridge including good connections on both banks, accommodating mainly Riga traffic;
- upgrade of the existing route on the West bank of the Daugava close to the river, providing a better, direct (freight) route north-south;
- upgrade of a new connection from Pernavas iela, via Vietalvas iela to the Eastern arterial, as an alternative for connecting the Eastern arterial with the city centre.

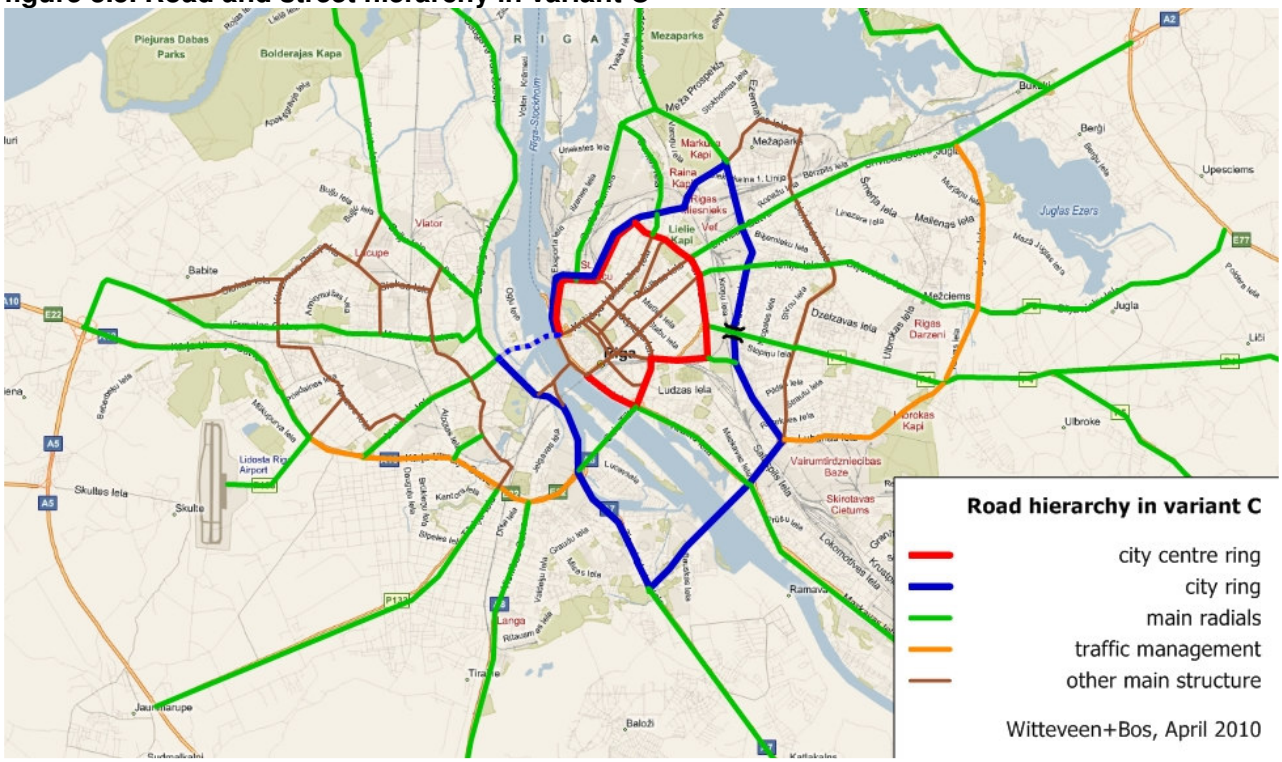
figure 3.4. Road and street hierarchy in variant B



The main distinguishing measures in variant C are:

- upgrade of the existing route on the West bank of the Daugava close to the river, including a new tunnel connecting Ranka dambis directly to Mukusalas iela, with this route being the major north-south route for years to come;
- upgrade of a new connection from Pernavas iela, via Vietalvas iela to the Eastern arterial, as an alternative for connecting the Eastern arterial with the city centre;
- implementation of an extensive traffic management system on the main radials with a focus on the routes connecting to the Southern bridge.

figure 3.5. Road and street hierarchy in variant C[4]



3.6. Cost benefit analysis

A cost benefit analysis has been made for each of the three variants. Table 3.3 presents the results of this analysis. Variants A, B and C are all economically feasible variants with (quite) high rates of return on investment. Variant A scores better than C, and C better than B. More information on the CBA is included in appendix III.

table 3.3. Summary of CBA results[5]

	variant A	variant B	variant C
total amount of investments (MEuro)	2,088	646	576
economic value of investments (MEuro)	1,637	507	451
EIRR (%)	+ 11.4 %	+ 6.6 %	+ 8.4 %

[4] Vansu bridge is part of the city ring in this variant, however this bridge is not accessible for heavy freight traffic.

[5] In the CBA terminal values have been taken into account for investments that have a longer lifetime than the time scope of the CBA; see Appendix III.

	variant A	variant B	variant C
ENPV (5.5 %, MEuro)	+ 1,075	+ 73	+ 119

Funding of variants A and B (to a lesser extent) might prove to be difficult. Basically transport infrastructure development in Riga and Pieriga is funded from EU co financing and State (MoT) and municipal (RCC) budgets. For these budgets and co finance an inventory has been made of current (and historic) budgets relevant to invest in (new) infrastructure. A projection is prepared based on the economic growth forecast for Latvia. Four scenario's have been developed for these budgets, in which the uncertainty of EU budgets in the next programming period is emphasized, and the Latvian transport investment budgets and the share of EU funds attributed to Riga and Pieriga are also included. The size of these budgets in the scenario's is compared with the budgets required for the realization of the RPMP variants.

In principle it can be concluded for variants B and C that, even in the Low scenario, it appears possible to fund the investments from budgets and loans (for (pre)financing), especially when these can be phased for several years. For Variant A (including NTC) it appears that funding might be possible only in favourable conditions, but this will probably be quite difficult. Another option is to study possibilities for cost reduction of the NTC.

Several laws and regulations and obligations to international lenders severely limit the capacity of Latvian public authorities to borrow funds or increase liabilities in another way. PPP projects combined with EU-co-funding are unlikely to be realized in the short term, because this is a very complex set-up which has very few successful examples in Europe so far. PPP results in a liability to the public authorities, unless the capital and maintenance costs can be fully paid by the road users. However, from preliminary studies this appears to be an unlikely situation.

3.7. Traffic model results

The autonomous developments and variants A, B and C have been implemented in the traffic model. Table 3.4 gives a summary of the results of the traffic model for the reference variant and the variants A, B and C. Compared to the autonomous basis, the variants show a similar or reduced car travel time, together with an increase in car travel distance. This indicates that there is a reduction in delays and congestion and a better traffic circulation, which leads to higher car travel speeds. In variant A there is a large improvement of 9 % in travel speed. Variant B shows an improvement of 2 %. In variant C there is only a marginal improvement in travel speed compared to the autonomous situation. On the routes towards the Southern bridge there are considerable improvements in this variant, however, the small average improvement is caused by the introduction of a low speed zone in the city centre, which has large effect on the average travel times.

Variants A and B show an increase in travel distance. Due to the introduction of a new river crossing more cross river trips are made. This means that there is an increase in mobility and connectivity in these variants. This increase results in mobility benefits for the inhabitants of Riga and Pieriga. The slight increase in trip distance in variant C is related to an increase in traffic via the Southern bridge.

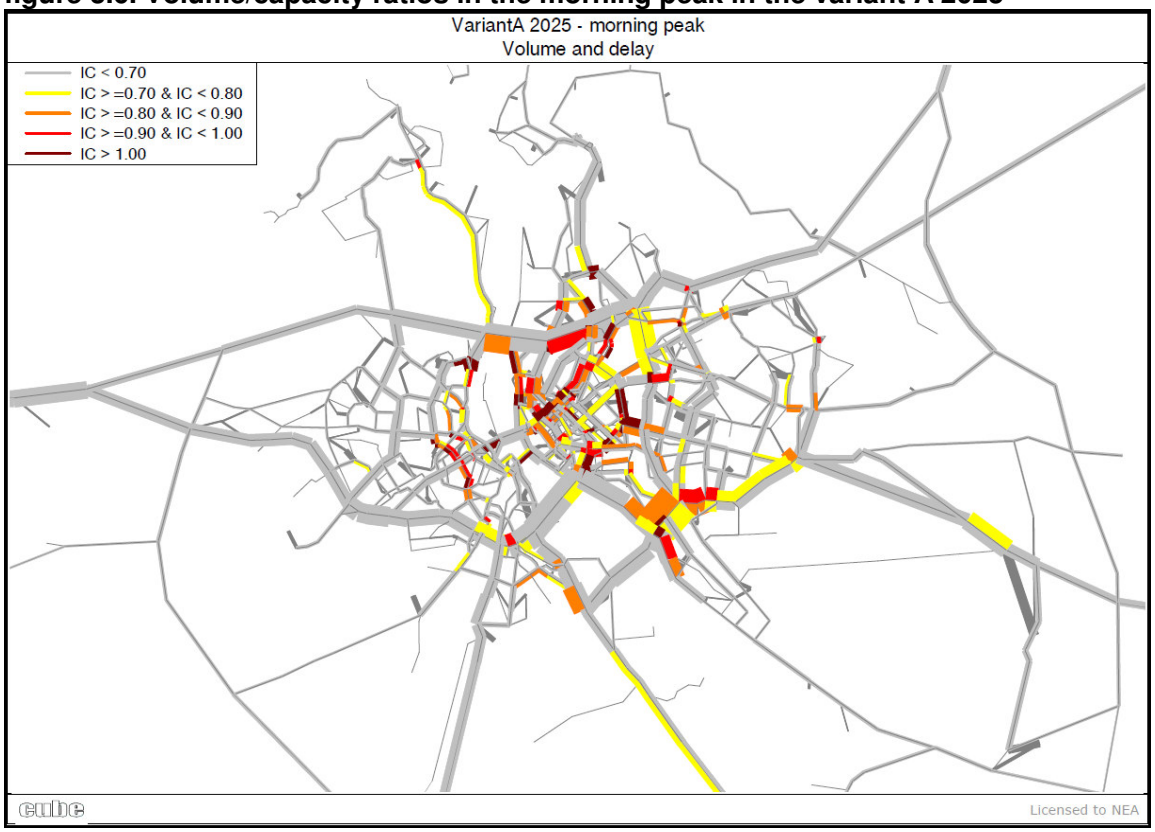
As for modal shift, variant C shows the greatest effect in modal shift to public transport. This is related to the fact that variant C does not contain new infrastructure, whereas all variants contain a similar package of public transport measures. In other words, the pull factor is similar, but the push factor is the largest in variant C. The traffic model clearly shows that the road and street hierarchy in variant A leads to the most optimal traffic circulation. Also in variant B there is a clear improvement, however less than in variant A. Variant C shows only marginal positive effects compared to the autonomous situation.

table 3.4. Summary of traffic model results for the three variants

variant	average car travel time (min/trip)	average car travel distance (km/trip)	average car travel speed (km/h/trip)	avg time saving per trip (compared to ref)	change in car trips (compared to Ref)	change in PT trips (compared to Ref)
ref	28,4	14,4	30,3	-	-	-
A	26,8	14,8	33,1	2,5 min	- 2.0 %	+ 18 %
B	28,5	14,7	31,0	0,7 min	- 2.4 %	+ 18 %
C	28,5	14,5	30,5	0,2 min	- 2.5 %	+ 18 %

Figures 3.6 to 3.8 give an overview of the V/C ratios[6] in the morning peak for each of the proposed road and street hierarchies. A complete set of traffic model results is included in the report 'Third interim report, Variants' dated 09-06-2010.

figure 3.6. Volume/capacity ratios in the morning peak in the variant A 2025



[6] The volume/capacity ratio is a measure for the level of service on the road network. Low ratios mean that there is capacity left for extra traffic. High ratios mean that most capacity is in use and congestion can develop. Volume capacity ratios close to 1 or larger than 1 indicate congestion.

figure 3.7. Volume/capacity ratios in the morning peak in the variant B 2025

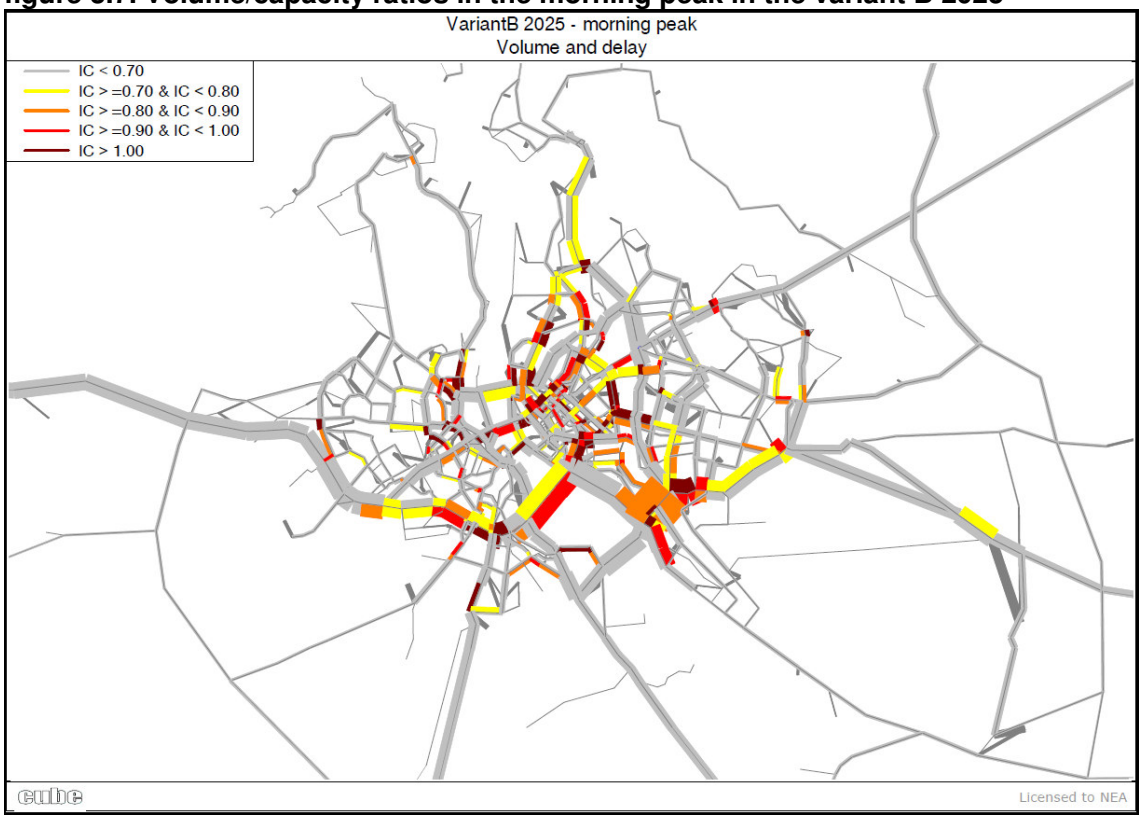
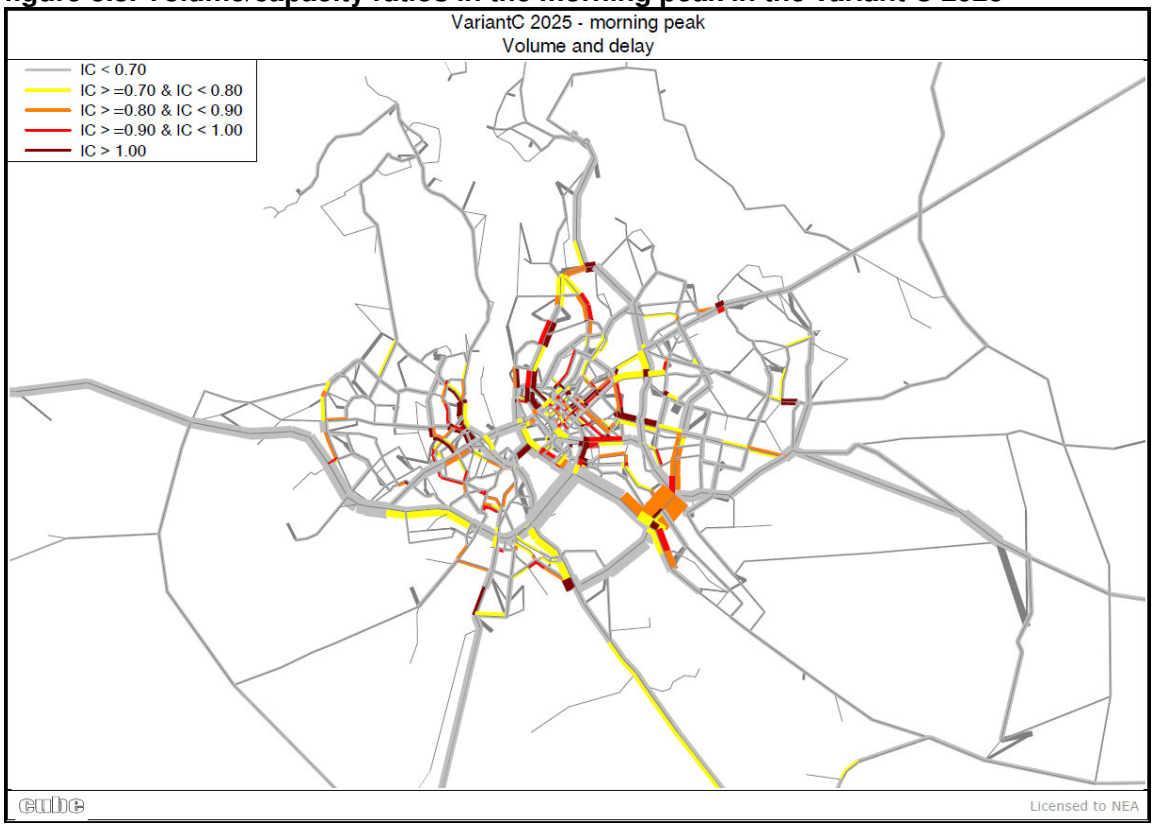


figure 3.8. Volume/capacity ratios in the morning peak in the variant C 2025



3.8. Multi-criteria analysis

To be able to recommend on a preferred variant for the RPMP the variants have been assessed with the traffic model and the cost-benefit analysis. However, these assessments alone do not give a complete idea on the performance of each of the variants compared to the objectives for the RPMP. Therefore, also a multi-criteria analysis (MCA) for the variants has been prepared, based on expert judgement. In this analysis the variants are scored for several qualitative criteria which are closely related to the RPMP objectives (relative to the autonomous situation). Table 3.5 gives a short explanation of the criteria used. The results of the analysis are shown in table 3.6.

table 3.5. Explanation of criteria used in the analysis

criterion	explanation
coherent road and street hierarchy	the road and street hierarchy is coherent if there is a complete, recognisable and understandable network of main roads and streets with similar design characteristics
network robustness	the network is robust if for the important origin-destination relations there are several route options available; in case of an accident on one route accessibility can still be guaranteed
connections of Riga Freeport	the quality of connections to the Riga Freeport by road, rail and public transport
connections of Riga airport	the quality of connections to the Riga airport by road, rail and public transport
accessibility of Pieriga	quality of the accessibility Pieriga-Riga by road, rail and public transport
multi modal accessibility	availability of connections for different travel modes on the main origin-destination relations
public transport development	improvement of the current public transport network and facilities as well as the performance
congestion reduction	reduction of the total amount of congestion in Riga and Pieriga (increase in the average travel speed)
mobility	improvement in the travel possibilities for travellers in Riga and Pieriga (e.g. a new PT line leads to extra mobility)
durability for future developments	the variant is durable if it contains reserve capacity, does not limit possibilities for future developments, and anticipates on developments
concurrence with existing plans	concurrence with the existing spatial and infrastructural development plans of the stakeholders involved
traffic safety	effect on the number of road accidents in Riga and Pieriga
liveability in Riga	effect on liveability aspects such as noise and air pollution
use of existing infrastructure in Riga	use of the existing infrastructure where possible, instead of development of new infrastructure
effect on nature and landscape	effects on areas with important value for nature and landscape
investment costs	the total investments needed for the variant (financial feasibility)
travel time gains	effect on the average travel time per origin-destination relation (reduction of travel times)
EIRR	economic internal rate of return

table 3.6. Results of the multi-criteria analysis

criterion	variant A	variant B	variant C
coherent road and street hierarchy	++	+	0
network robustness	++	+	0
connections of Riga Freeport	++	+	0

criterion	variant A	variant B	variant C
connection of Riga airport	++	+	+
accessibility Pieriga	++	+	+
multi modal accessibility	++	++	+
public transport development	++	++	+
congestion reduction	++	++	+
mobility	++	+	0
durability for future developments	++	+	0
concurrence with existing plans	++	0	0
traffic safety	++	+	+
liveability in Riga	++	+	+
use of existing infrastructure in Riga	--	-	0
effect on nature and landscape	--	-	-
investment costs	--	-	0
travel time gains	++	+	0
EIRR	++	+	+

3.9. Conclusion

Variant A has a sparse main road and street structure, including construction of the NTC. This variant has the largest positive effects on the functioning of the transport system, but also the largest investments and the largest impact on the environment. However, the investments turn out positive in the cost-benefit analysis due to the large benefits of this variant. Variant B has a more dense main structure, with construction of the Hanza crossing. Also this variant has quite large positive effects on the functioning of the transport system, but this variant is less positive in the CBA than variant A, due to less benefits.

Variant C has only a small positive impact on the functioning of the transport system, in line with the small investments. This variant turns out positive in the CBA, but performs worse than other variants on the other instruments used (modelling and MCA). This variant clearly shows that real investments are necessary to improve the functioning of the traffic and transport system on the longer term.

Based on the results of traffic modelling, the cost-benefit analysis and the multi-criteria analysis variant A clearly achieves the best results for the RPMP. However, financing of the Northern Transport Corridor, which accounts for 75 % of the variant's costs, is an important condition for this variant. The Steering committee for the RPMP has decided on June 16, 2010, to choose variant A as the preferred variant. This variant presents the future perspective which is desired for Riga and Pieriga. Therefore, variant A has been the basis for the RPMP which is further elaborated in this report. An important part of this elaboration is the prioritization and planning of the measures included in the plan and the elaboration of financial sources to cover the investment costs involved.

3.10. Network performance preferred variant

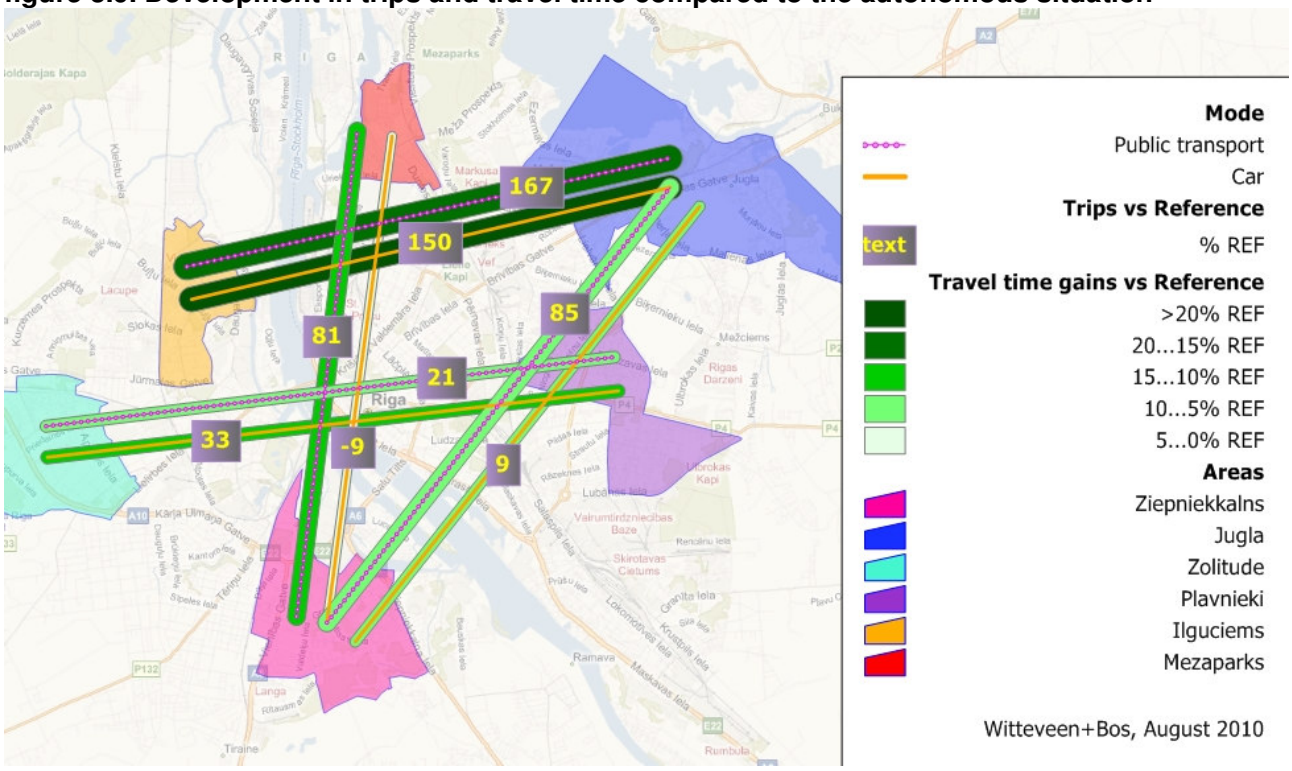
After choosing the preferred variant the network performance has been considered more closely. On an aggregate level the results in previous paragraphs have shown that variant A performs better than the autonomous situation, both for car/truck and for public transport. Can this also be concluded for arbitrary relations between origins and destination across the city? In order to assess this some cross-city relations have been identified.

The results are depicted in figure 3.9. The pink, dotted lines refer to public transport, the yellow, straight lines to car. The width of the buffers around the lines has been scaled to the relative number of trips versus the autonomous situation, the labels depict the exact percentage. As can be seen, almost all re-

lations contain more trips than in the autonomous situation. The colours of the buffers refer to the relative travel time. Since all the colours are a variant of green, travel times have improved across all relations and modes. Please note that the lines do not match a certain route.

The figure shows that when the travel time is more favourable compared to the autonomous situation, the relative number of trips with that mode and on that relation is greater. This is a plausible result. The figure also shows that on most relations the trip growth is greater in public transport. This proves, the transversal lines work well in attracting passengers. The substantial travel time gains with both modes between Ilguciems and Jugla is of course related to the extra river crossing capacity established.

figure 3.9. Development in trips and travel time compared to the autonomous situation



3.11. Additional information

Complete information on the variant development is given in the report 'Third interim report, Variants' dated 09-06-2010. A description of the development and characteristics of the traffic model for the RPMP is given in the report 'Second interim report, Traffic modelling' dated 12-04-2010.

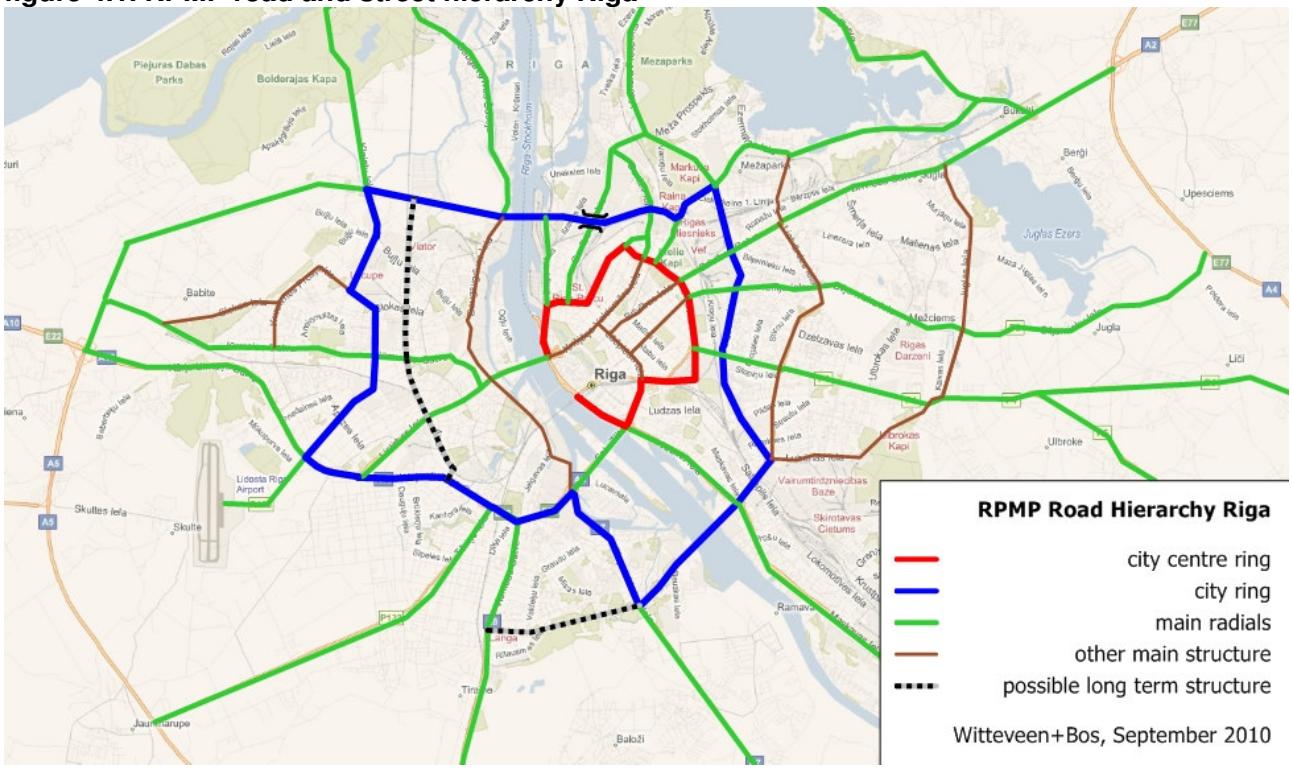
4. RPMP NETWORK STRUCTURE

This chapter presents the network structures for road, rail and public transport for both Riga and Pieriga. The future structures are given and the RPMP measures are identified. Cost estimates and implementation periods for the measures are given in the appendices. Furthermore, a part of the measures is elaborated in fact sheets in appendix I and enlargements of several figures are included in appendix XIX.

4.1. Road and street network Riga

The RPMP road and street hierarchy for Riga is shown in figure 4.1. The philosophy for this hierarchy is a sparse main street network with high capacities and traffic calming in the areas in between the structure. To arrive to this future hierarchy and the accompanying philosophy, projects and measures are defined in the RPMP to be implemented in Riga and Pieriga till 2025. Table 4.1 presents the main projects defined for implementation in Riga. The projects are divided in short (s), medium (m) and long term projects in the scope of the RPMP. The table presents the projects in order of planning and priority. The projects are shown in figure 4.2. More generic projects with an annual budget (a) are presented in table 4.2, again in order of priority.

figure 4.1. RPMP road and street hierarchy Riga



The basic principle for the city ring and city centre ring is ensuring priority for traffic on the ring structures over traffic on intersecting streets in the network. The city ring has a 2 x 2 lane configuration with a maximum speed of 70 km/hr and without or with hardly any traffic lights by using fly over constructions or tunnels. It can be seen as a city highway, but with reduced travel speeds. The main purpose of the city ring is fast traffic flow around the city centre with several access roads to different locations in the city centre.

The city centre ring has a smaller 1x1 lane configuration or at some locations a 2 x 2 configuration depending on the forecasted traffic demands. Travel speeds should be maximized to 50 km/hr. The city centre ring will not be constructed with expensive fly-overs or tunnels, but instead an adequate traffic

flow is reached by installing traffic management systems to provide priority to traffic on the city centre ring. This is more or less similar to the well known green wave, only with a different traffic management technique.

For both ring structures it is necessary to develop a signposting system to direct passenger car traffic to the city (centre) ring and from there to the different parts of the city. Development of the ring structures will need several infrastructural investments and investments in traffic management systems to improve traffic flows at especially the city centre ring. Specifically measure RD17a has been introduced to complete the road network and to eliminate existing bottlenecks in the ring structures. Furthermore, measure RD18a is part of the action program to implement traffic management systems.

table 4.1. Road and street projects Riga (RD = road measure, s = short term, m = medium term, l = long term, APc = construction in action program, APs = study in action program)

code	measures	description
RD1s (APc)	3rd section of the Southern bridge	to improve the use of the Southern bridge good connections to the main network are imperative. The connections of the bridge on the East bank are part of the reference situation. The finalization of the connection to the A7 (stage 3) will be realized as part of the RPMP. On the short term the transit routes in Pieriga will not be improved. The Southern bridge is an important connection for transit traffic and therefore the finalization of the connections has high priority.
RD6m (APc)	connection city and city centre rings (part of Eastern arterial design)	this project involves construction of a new, grade separated connection between the two ring structures, in order to complete the main road and street structure, better disentangling local traffic from through traffic. The connection is included in the new design for the section of the Eastern Arterial from Vietalvas iela to Ieriku iela (ref 4).
RD10s (APc)	short term improvements West bank (intersection Daugavgrivas iela - K. Valdemara iela and Ranka dambis tunnel)	Reconstruction of the connection of Daugavgrivas iela with K. Valdemara iela. To improve the access of the port area and the Vansu bridge (on the West bank) on the short term the connection of the Daugavgrivas iela, via the K. Valdemara iela to the Vansu bridge needs to be improved. The Ranka Dambis tunnel gives a short term solution for the bottlenecks on the West bank to the south of Vansu bridge. The tunnel is not part of the main RPMP structure, however it provides an improvement on the shorter term till the finalization of the NTC and the western arterial. With these measures the connection between the port area and the TEN-T network will be improved. Furthermore, it results in improvement of liveability in the residential and development areas close to the river front. For both projects the designs have already been prepared.
RD4m (1st segment APc)	Northern Transport Corridor (NTC) (Eastern arterial to A2)	In line with variant A a complete NTC will be constructed, including a new Daugava crossing. This will increase accessibility of the city centre and the port areas, solving liveability issues and making structural transport system changes and new spatial developments possible. It is important to properly connect the NTC to the network. The connections are also part of the RPMP. The development and design of the NTC is further discussed in the financial chapter. The development is split into 4 segments (see fact sheet 17): - segment 1: the eastern part of the NTC between the A2 and the Eastern arterial; this part is a short term project; - segment 2: the central part of the NTC from the Eastern arterial to the west till Daugavgrivas iela, including the river crossing; this part is a medium term project; - segments 3 and 4: the western part of the NTC between the A10 and the Daugavgrivas iela; this part is a medium term project.

code	measures	description
RD2s (APc)	one-way system and railway crossing	the crossings of the railway loop on the east (right) bank of the Daugava are clearly capacity bottlenecks for traffic flow. Brivibas gatve and Aleksandra Caka iela are two main radials from Pieriga towards the Riga city centre with severe problems in both the current and future situation. The model results show that these radials are congested around the crossings with the railway loop. The RPMP includes a one-way system, with Aleksandra Caka iela leading into the city centre from the city centre ring and Brivibas iela outside the centre, till the city centre ring. Furthermore, improvement of the crossing of Brivibas iela with the railway is included.
RD3s (APc)	non-motorised and public transport priority streets	in order to avoid traffic rerouting because of the one-way system Terbatas iela and K. Barona iela are downgraded to city boulevards with priority for non motorised transport (NMT) and PT. This is in line with the idea of traffic calming for the city centre area. Modelling analyses have shown that this measure in combination with RD2s leads to an improved traffic situation in the city centre. The further design of this measure will be determined during the RPMP period.
RD9m (APs)	Arterial route West bank	part of the city ring is a western tangential route with some distance to the river bank to relieve the area between this route and the river bank from traffic wanting to use the NTC crossing. The route consists for the largest part of existing streets. Furthermore, it includes construction of a connection from Jurkalnes iela to Jurmalas gatve which is planned in the red-lines of the spatial plan. There is no design for the route and it is a medium/long term project. It is recommended to prepare a feasibility study for this route in the first period of the RPMP. As depicted in figure 4.2 there are alternative routes conceivable (RD13l).
RD11m (APs)	Kundzinsala and Tvaika iela connections	(Re)construction of the roads in the port area around Kundzinsala and Tvaika iela to improve the access of the port area. Start of feasibility and design studies in the first implementation period of the RPMP. Construction depending on the study outcomes. Possibly within second implementation period. Feasibility study should include reconstruction of Tvaika iela
RD15l (APs)	introduction congestion charging	it is recommended to start a feasibility study for introduction of congestion charging in Riga during the first implementation period of the RPMP. Based on the outcomes of this study decisions on the actual implementation can be made.
RD5m (APs)	bypass for Valmieras iela	in order to relieve Valmieras iela from traffic flows and hindrance a new connection will be developed between Satekles iela and Pernavas iela, just to the north of the railways. Together with Pernavas iela this connection forms a bypass for Valmieras iela. This idea has been part of Riga City Council plans.
RD12m (APs)	Bolderaja connection	(Re)construction of the roads in the port area around Bolderaja to improve the access of the port area. Start of feasibility and design studies in the RPMP period.
RD7m (APs)	downgrade of Akmens bridge	the Akmens bridge gives direct access to the city centre, but currently facilitates traffic that is not related to the centre economy, leading to liveability and road safety problems. In the first phase the capacity of the bridge will be reduced and speed is lowered to discourage transit traffic of using this bridge. The bridge will not be downgraded for public transport and non-motorised transport, making these modes more competitive. Only after implementation of the NTC crossing, the downgrading for cars and trucks will be completed. Traffic using the Vansu bridge will then partly reroute to the NTC, leaving capacity for traffic from the Akmens bridge to be rerouted via

code	measures	description
		Vansu bridge. It is recommended to start a study in the first period of the RPMP program how to restructure the bridge in accordance with development plans for the East bank.
RD8m (APs)	Vansu bridge	in the current situation the Vansu bridge has a connection on the East bank in eastern, northern and southern direction. These connections form a bottleneck for the traffic flow. In the future situation it is recommended to close the connection from Vansu bridge to the south and improve the connections to the east and north. These improvements are closely related to the construction of the NTC and the traffic calming/reducing measures on Akmens bridge and in the city centre. In the existing traffic structure it is not possible to optimize the traffic situation without large reconstruction measures. Improvement with the existing infrastructure is only feasible after construction of the NTC. Therefore, the reconstruction of the Vansu bridge connection is a medium/long term project, which is not included in the RPMP action program. It is recommended to start a feasibility study in the first period of the RPMP program to investigate the possibilities for this connection. Attention should be given to the restrictions of working in the UNESCO area.
RD13l	alternative arterial route West bank	this project is about providing an alternative route to RD9m, directing traffic more directly to the Southern bridge. With this route RD9m can lose its function as main route. It is also feasible that a combination of RD10l and RD9m will form the western main route.
RD14l	4th section Southern bridge	traffic modelling showed that this connection between the A7 and A8 does not have great value for traffic demand on the short term. However, on the long term this link might become interesting as a short-cut to the Southern bridge, avoiding traffic choosing routes through Ziepniekkalns. In appendix I a fact sheet has been included, with analysis of the future demand for this section.

figure 4.2. Road and street projects Riga (s,m,l = short, medium and long term)

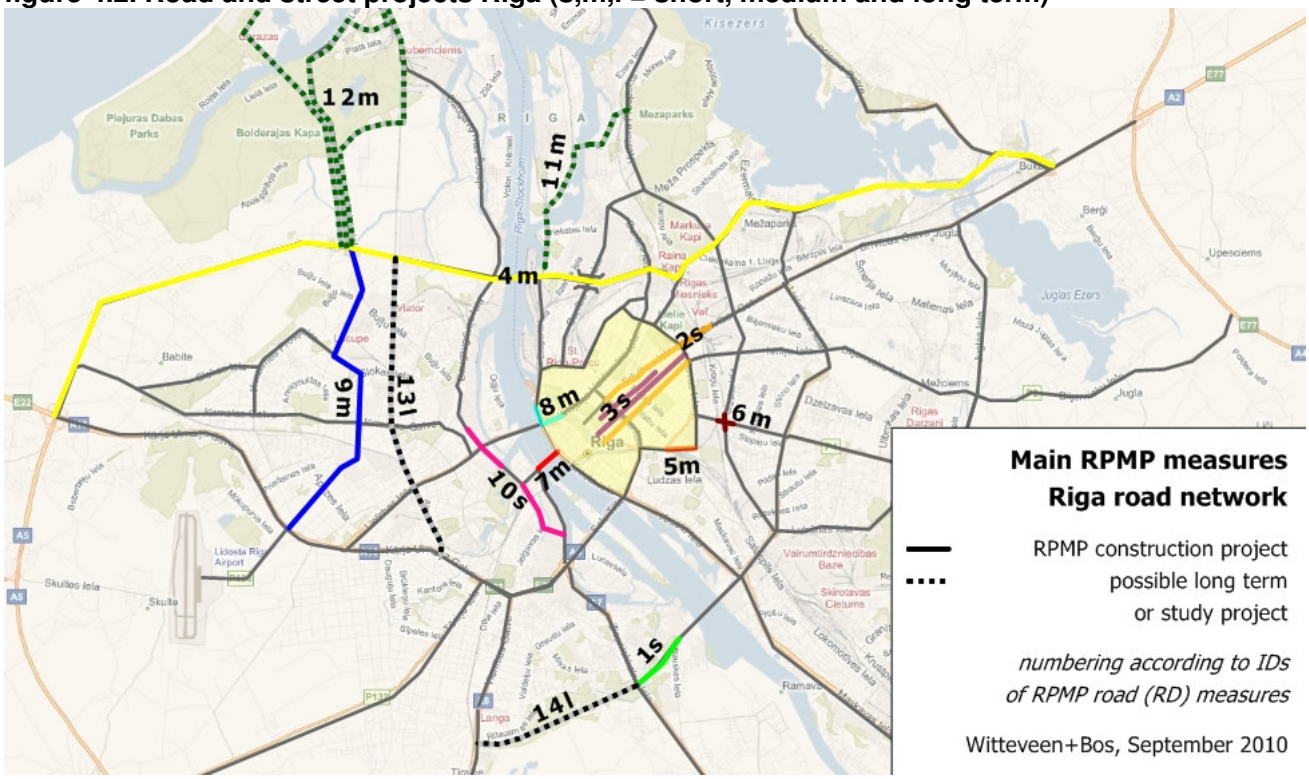


table 4.2. Road measures Riga with annual budget (RD = road, a = annual, APc = construction in action program, APs = study in action program)

code	measures	description
RD18a (APc)	traffic management and monitoring system	this measure consists of traffic management to improve traffic flows on the city ring and city centre ring by means of adaptive traffic control, variable message signs and a PT-priority system. On the medium term the basis for a traffic monitoring system is set.
RD17a (APc)	completion of the main road and street structure	the main road and street structure in the RPMP hierarchy consists for a large part of existing roads and streets. However, there are several additional links and upgrades of road and street sections and intersections necessary to complete the main structure. The main missing links are the western tangential route (see RD9m) and the connections with the NTC (see RD4m). Another important missing link, included in the autonomous situation, but not yet with a budget allocated, is the connection Braslas iela – Gustava Zemgala gatve. Next to these missing links several junctions need to be upgraded. In the first term of the implementation period a feasibility study will be conducted to locate all junctions on the main road and street structure with a low level of service, and study alternative ways for optimization. In the following years these junctions will be optimized. The following junctions should at least be part of this study: Lacplesa iela – Satekles iela, A. Deglava iela – Pernavas iela triangle, Zirnu iela – K. Valdemara iela, K. Ulmana gatve – Vienibas gatve, Kalnciema iela – Slokas iela and Hanzas iela – Pulkveza Brieza iela.
RD19a (APc)	traffic safety measures	one of the main objectives for the RPMP is to improve traffic safety. Therefore, budget is assigned to measures for improving traffic safety in Riga (e.g. reconstruction of intersections, NMT crossings). Before implementing measures, a study should be conducted to assign the locations and the necessary activities (together with CSDD). The following junctions should be part of this study: Brivibas iela - Pernavas iela, Akademika Mstislava Keldisa iela - Andreja Saharova iela, Apuzes iela - Jurkalnes iela, Graudu iela - Vienibas gatve, Apuzes iela - Volguntes iela.
RD16a (APc)	traffic calming in the city centre	traffic in and around the city centre is currently using a grid system with many one-way streets. This system has lost its reserve capacity, leading to congestion and gridlock effects. It is also responsible for traffic unsafety and liveability problems. For the city centre therefore a new street hierarchy should become effective. Next to a limited number of main streets a system of traffic calming is implemented on streets which do not belong to the main structure. Traffic calming is effectuated with measures such as narrowing street surface, reducing speeds, and route guidance to main roads and streets. The implementation of measures will be started with pilot projects on the streets with most traffic hindrance. Based on the results of the first pilots, measures on other streets can be implemented.

The factsheets in appendix I give a further elaboration of most of the projects in tables 4.1 and 4.2. Furthermore, an overview of the measures including implementation period and cost estimation is given in appendix IV. The projects to be implemented in the first seven years (2011-2017) are included and described in the action program.

Non Motorised Transport

Non motorised transport is referring to cyclists and pedestrians. In the following paragraphs the focus is on cyclists. Nevertheless, most measures also apply to pedestrians.

Several studies and surveys have shown that the bicycle can become a substantial mode in Riga and Pieriga. Cycling instead of going by car has all kind of advantages, for individuals and the society. In the RPMP the main focus is to improve the conditions for using the bicycle in mandatory trip making, i.e. going to work and to school. It can be argued that students and pupils going to school are not regular car drivers, but they might be car passengers and for establishing a bicycle culture young people play a key role. Obviously, cycling to work on the other hand, will temper the pressure on roads to Riga and roads to and within the city centre.

In Pieriga the focus is to pilot with high-standard park and ride facilities next to railway stations. Next to the possibility to park your car in a safe manner, it should also be reassured that the facilities are accessible by bicycle, including the provision of guarded bicycle parking. The fact sheet on P&R gives more insight information on this matter. Also in Pieriga it is important to improve crossings of state roads and railways for pedestrians and cyclists. In collaboration with CSDD an inventory and prioritisation will be made on the short term.

figure 4.3. Impression Critical Mass Riga 2010

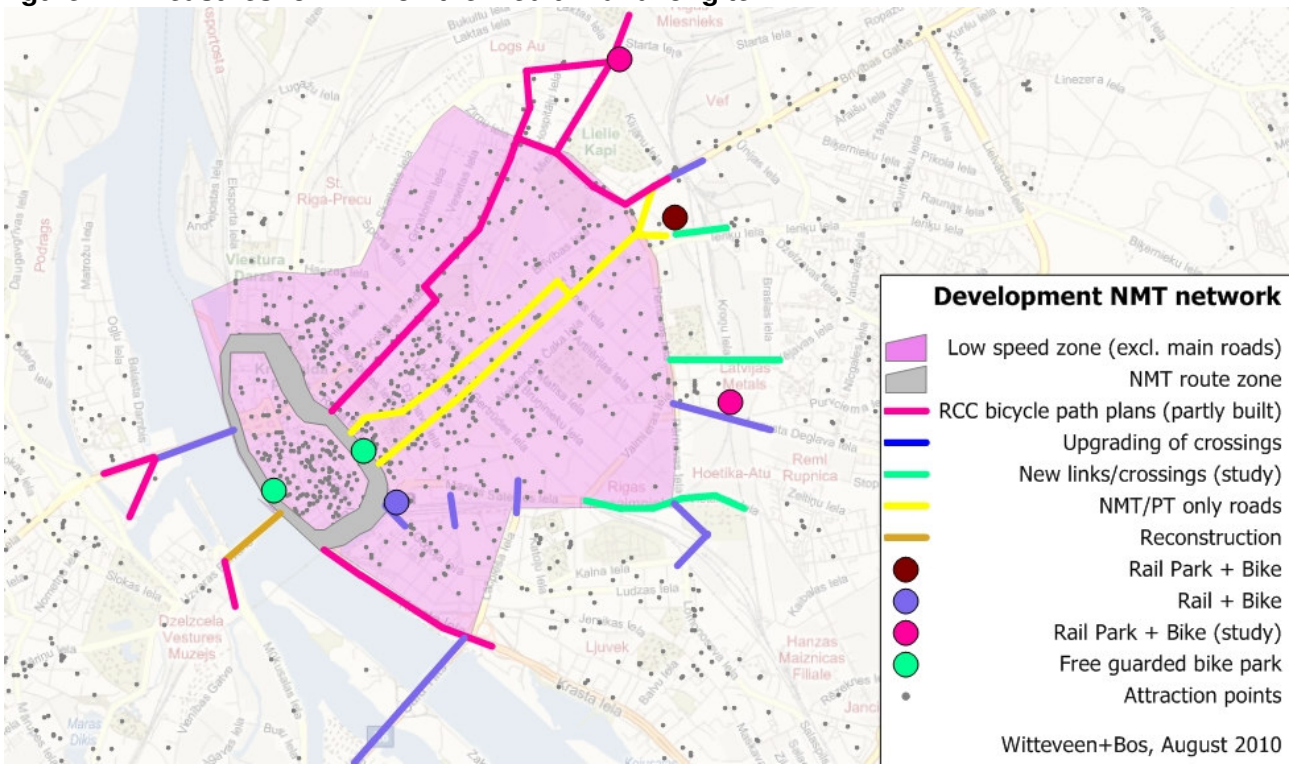
For Riga RCC worked out a plan to make the city centre more accessible by bicycle, coming from all kind of directions. One of the routes being built is the route between the old town and Jugla, via K. Valdemara iela and Brivibas gatve. The plan fits very well with the RPMP, although the budgets for this plan are not incorporated in the RPMP for the short term. Instead, for the short term low-cost measures are suggested in the RPMP:

- start implementing a bicycle network by signposting and marking the routes;
- stimulate companies to establish rental and guarded parking facilities, e.g. next to Zemitani station, Central station and the old town;
- upgrade existing river and railway crossings and access roads with proper marking, lighting, lowering high curb stones at the end of walkways etc. Since for NMT there should be as many routes as possible, all crossings need to be reviewed;
- start a marketing campaign, involving important stakeholders like libraries, sports facilities, city council, schools, major companies, to discuss options to get more employees and pupils/students on the bicycle. Recent campaigns by CSDD can be used as example;
- when conducting road maintenance and major road works, e.g. eliminating black spots, include the bicycle in the plans.

Figure 4.4 provides an overview of measures for the medium and long term. On the medium term some new links will be established, like a proper railway crossing at Zemitani, also avoiding pedestrians and

cyclists to cross the railways at ground level. Also, the border zone around the old town will be further developed to promote cycling and walking. Currently, the river boulevard is not well connected to the city centre, with only two guarded crossings in place. In the case of a closure of 11. novembra krastmala, NMT should play a major role in reconstruction plans. An important missing link is the connection between the Central station/market and the river side. If the river side is going to be developed, such a connection will become imperative.

figure 4.4. Measures for NMT on the medium and long term



An important part of the NMT network is the connection between Zemitani railway station and the old town, and further over Akmens bridge. This route will be established by reconstructing Terbatas iela, K. Barona iela and Akmens bridge as PT/NMT only. Around the old town some free-of-charge, guarded parking facilities will be installed, and at Zemitani station there will be a park+bike facility. The figure suggests that the number of NMT routes is limited and north-south routes are lacking. This is not the case. In fact, all non-major roads in the city centre are part of the network, especially when the traffic calming is implemented and traffic safety is reassured. For stimulating the usage of certain links, signposting and marking is needed instead of expensive NMT facilities. Along major roads in the city centre, like the city centre ring and K. Valdemara iela, special attention has to be given to (informal) pedestrian crossings. Just as in the case of Pieriga an inventory study will be conducted to work out where measures such as fences and refuge areas are needed.

4.2. Road and rail network Pieriga

This section presents the main road infrastructure projects for Pieriga. Appendix V presents cost estimates and implementation periods for these projects. The projects are part of the main road hierarchy foreseen for Pieriga as depicted in figure 4.5.

Table 4.3 presents the main road projects for Pieriga. The projects are listed in order of priority. Planning and prioritizing of the projects is done in the action program. The projects are also shown in figure 4.6. Most projects include measures like reconstruction of existing carriageways, closing of all at-grade u-turns and some at-grade slip roads, retaining individual right-turn slip roads (left turns can be made at

two-level interchanges), reconstruction of existing overpasses and pedestrian tunnels, construction of additional overpasses, building of car and bicycle/pedestrian tunnels and bicycle/pedestrian overpasses.

In addition fences and noise barriers will be build along roads passing residential areas. Street lighting will be placed at motoring and bicycle/pedestrian overpasses, tunnels, and along pedestrian paths where sections of the road are in the immediate vicinity of residential areas. The intended result of these projects is the reconstruction of major national roads into safe, high-quality, dual carriageway express roads, with an estimated traffic flow speed of 110 km/h. It should be mentioned that next to the projects listed in table 4.3 the LSR maintenance program will make upgrading of other road sections possible.

figure 4.5. RPMP main road hierarchy for Pieriga

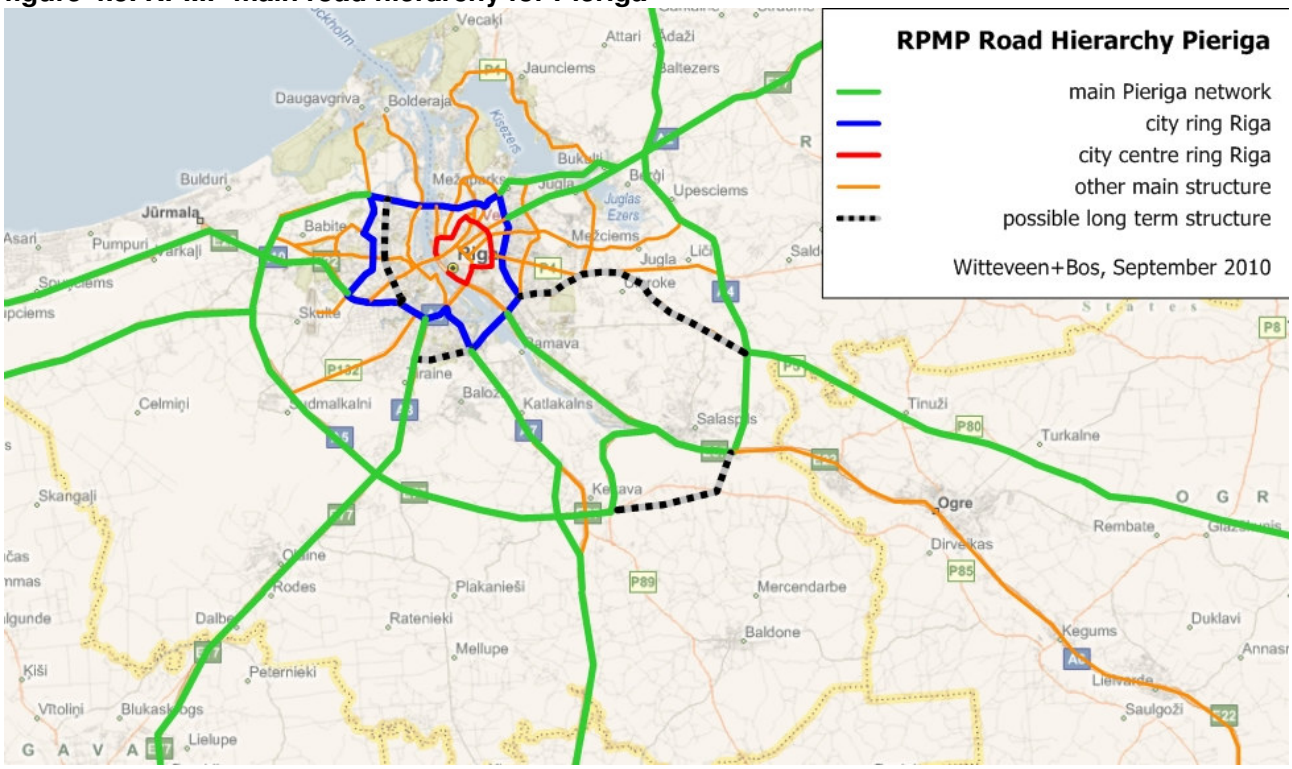


table 4.3. Road projects Pieriga (RD = road measure, s = short term, m = medium term, l = long term, APc = as construction in action program, APs = as study in action program)

code	measures	description
RD20s (APc and APs)	Cohesion Fund Project E22 Riga (Tinuzi) - Koknese	(re)construction of the E22 route parallel to the A6 highway. The highway A6 crosses through several towns. This causes delays, liveability and traffic safety problems. Several major black spots are located on this route and the route is part of the commuters road/rail corridor Riga-Aizkraukle. The E22 project will allow for (truck) traffic to choose this route instead of the A6. The route of E22 follows for a large part the existing alignment of the P80. The part from the A4 bypass till Tinuzi (km 0 - 5.1) has been finished in 2009 and is part of the reference situation. For the section from Tinuzi till Viskali (km 5.1 - 40.6) the construction started in 2010 and is planned to be finished in 2012. The part from Viskali to Koknese (km 40.6 - 63.6) will be finished in 2011. The road is designed with 1 lane per direction and a speed of 90 km/h. The E22 from Tinuzi to Koknese is included in the action program. Furthermore, a study for the Riga inlet (alternative alignment of entrance roads

code	measures	description
		P4/P5 into Riga, section from bypass A4 to Slavu roundabout in Riga) is included in the action program.
RD21s (APc)	reconstruction of E77/A2	reconstruction of the section between the Riga bypass and Senite, into a safe, high quality dual carriageway. This section is part of the TEN-T network, linking the A4 with the A3, and plays an important role in the commuters road/rail corridor Riga-Sigulda. Figures from LSR show that traffic flow is relatively high and has not suffered from economic downfall. When economy rises again, the A2 is expected to show relatively large growth figures. The project also involves the upgrade of several bridges and viaducts. The reconstruction is a pilot project for LSR for the use of a PPP financing construction. DBFM (design-build-finance-maintain) principles are used together with long-term service contracts and attracting of financing from private investors.
RD22s (APs)	development of the PTA organization	it is recommended to start on short term investigations for the installation of a public transport authority. Based on the results of the investigations a plan for the PTA can be developed and implemented.
RD23m	construction of the E67/A7 Kekava bypass	construction of a bypass of state road A7 around Kekava. It will solve liveability and traffic safety issues around Kekava and will provide a faster connection to Via Baltica. Currently, the A7 is relatively unsafe, with several major black spots existing around Kekava. The expectation is that the situation will worsen after finalization of the connection of the Southern bridge. The A7 is part of the commuters corridor Riga-Bauska. The project is planned to be implemented with a PPP financing construction.
RD24m	reconstruction of the E67/A4 Riga bypass	reconstruction of the section between the A6 and the A2. This section is an important part of Via Baltica, also connecting RD16s and RD17m. The project is also important for attracting more transit traffic, hence avoiding usage of the Slavu ring. The project is planned to be implemented with a PPP financing construction.
RD25l	reconstruction of E22/A10 section Priedaine - Sloka	this project is part of the upgrading of the A10 (two lanes in each direction, including sidewalks), which have already been carried out between Jurmala and Riga. The A10 plays an important part in the commuters road/rail corridor Riga-Tukums. The project is considered as a long term project and is not included in the RPMP program, since this part of the A10 plays a lesser role for commuters and traffic safety is quite reasonable, relatively speaking.
RD26l	reconstruction E77/A8 section Riga - Jelgava	this project concerns the upgrading of the A8, together with the A2 the busiest state road, responsible for the road accessibility in the road/rail corridor Riga-Jelgava. The Riga section is currently being upgraded and the intersection with K. Ulmana gatve is part of the RPMP. The part to the north of Jelgava needs upgrading in the future. The traffic flow is hindered and there are several major black spots existing (around Brankas). Despite these issues, the project is considered as a long term project. The black spots however are part of RD29a.
RD28l	new connection A5-A4	the Rigas HES dam is part of the Via Baltica route, but has limited capacity and the construction is vulnerable. Furthermore, load restrictions will be introduced for this dam in the future. On the long term it is therefore considered necessary to construct a new connection between the A5 and the A4. On the shorter term the Southern bridge in Riga provides a good transit route, once the connections are finished. The rationale for not adopting the new connection in the RPMP program is elaborated in a fact sheet in appendix I.
RD27l	construction	the E67/A7 is part of Via Baltica, being an important link for international

code	measures	description
	of the E67/A7 Iecava and Bauska by-pass	(freight) traffic and for the commuters road corridor Riga-Bauska. In order to reduce delay and to solve liveability and traffic safety issues it is planned to construct bypasses around the two main towns along the route. The project is considered as a long term project.

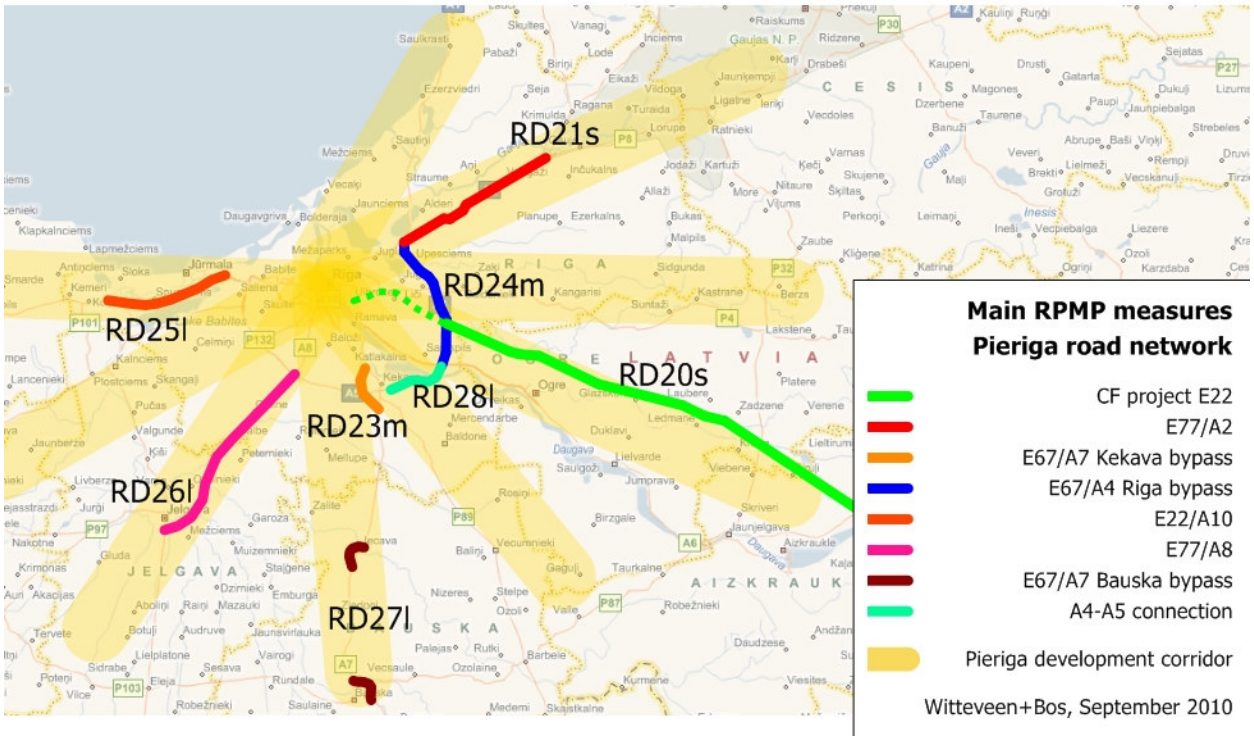
table 4.4. Road projects Pieriga with annual budget (RD = road measure, a = annual, APc = as construction in action program)

RD29a (APc)	traffic safety measures	one of the main objectives for the RPMP is to improve traffic safety. Therefore, budget is assigned to measures for improving traffic safety in Pieriga (e.g. reconstruction of intersections, NMT crossings). Before implementing measures, a study should be conducted to assign the necessary activities (together with CSDD).

The road measures in Pieriga are based on the already started projects and priorities of Latvian State Roads for Pieriga. This program fits very well with the philosophy of the RPMP for Pieriga. As stated previously the main focus in Pieriga is to enhance accessibility in commuter corridors, primarily in corridors with a passenger rail network, and to increase liveability and traffic safety, mainly by eliminating black spots. Traffic safety is a very important reason for taking up state road projects: 32 % of all serious accidents and 67 % of all casualties occur on these roads. Also, the route Via Baltica is considered to be of great importance for Pieriga and Latvia and therefore receives high priority.

In figure 4.6 the commuter corridors are shown in yellow. There are five corridors along the passenger railway lines and four corridors in between. Spatial developments as well as development of the road network should primarily focus on the road/rail corridors. The corridors are discussed in clockwise order, starting with the road/rail corridors. In the A1 corridor no major projects are envisaged. Recently, already some major improvements have been made, like the Saulkrasti bypass. Also, traffic safety on the A1 is very reasonable. In the A2 corridor project RD21s is considered important, since the A2 carries the highest traffic loads and these loads are expected to rise when economy grows.

figure 4.6. Main measures for the Pieriga road network in the RPMP



Project RD20s in the A6 corridor has been adopted in the RPMP, since this corridor is important for commuting and the existing A6 scores badly on traffic safety, although some projects are being carried out to solve these issues. As for the A8 corridor, this road carries the biggest long-distance commuter flows, but the road is already high standard, relatively speaking. The Riga part of the A8 is already reconstructed. Other black spots, e.g. around Brankas, are part of project RD29a. Upgrading of the whole route (RD26l) has been given lower priority. For the A10 corridor the same applies as for the A1 corridor, e.g. the overpass on the A5 over the road A10 has just been reconstructed, although the western part of the A10 has not been upgraded yet. This western part is of less importance for commuting and the traffic safety record is reasonable, hence it has received lower priority (RD25l).

As for the corridors without a passenger railway, upgrading of roads should primarily be focussed on traffic safety and liveability. Major road reconstruction to enhance accessibility will give rise to new dwellings in the countryside, far away from rail infrastructure, hence stimulating car mobility. As for the P4 Ergli corridor, recently several reconstruction works on the P4 have been conducted. This corridor might become road/rail, if demand would rise and the railway line would be reinstated in the future. The P89 corridor is just as the P4 not yet important for commuting, hence no projects are included in the RPMP program. The A7 corridor is part of the Via Baltica route and of strategic importance for long distance traffic. On this route there are many severe black spots existing. For the sake of accessibility, traffic safety and liveability RD23m is included in the RPMP program. On the longer term RD27l is envisaged. Finally, the A9 is just as the P4 and the P89 not (yet) important for commuting. There are some black spots on the A9 that should be eliminated (part of RD29a), but the road is not unsafe, relatively speaking. Therefore, no major road works are adopted in the program.

For a fast and reliable connection of the state roads in the corridors, the Riga highway ring A4/A5 is important. Upgrading of the A4 is included in the RPMP (RD24m), since it connects RD20s and RD21s, is part of Via Baltica and serves as an outer ring next to Slavu ring, relieving Slavu ring from traffic that has a good alternative with the A4. Reconstruction of the A5 has not been adopted in the RPMP, although in the long run extra lanes might become necessary for increasing throughput. Currently, there are some black spots existing on the A5. They will be considered in project RD29a.

Finally, in the long term, a new connection between the A5 and the A4 is envisaged (RD28l), to enhance the level of service of Via Baltica, safeguarding the dam construction. For Pieriga such a river connection in the ring around Riga is of strategic importance. Currently, the HES dam provides sufficient capacity, however the construction of the dam is vulnerable. Several analyses have been conducted to study the need for a new A4-A5 connection from an accessibility viewpoint (see the fact sheet in appendix I). The analyses show a limited demand for this connection, therefore, it is not included as short or medium term project. However, because of the strategic importance and the vulnerable dam construction is it recommended to be construction in the period starting from 2025. In the period till 2025 a part of the (freight) traffic currently using the HES dam will be rerouted via the Southern bridge in Riga.

rail infrastructure

The RPMP does not incorporate the development of new rail infrastructure or capacity extension of existing tracks till 2025. The available network is sufficient. The only foreseen extension of this network is a cargo line to Krievu sala on the left bank of the Daugava. This line consists of a piece of double track with a length of approximately five kilometres, one or two stops and the connection to the existing railway near Bolderaja. This project is included in the reference situation.

For cargo transport a new river crossing next to the NTC or to the South of the Riga dam is not included in the program for the short and medium term, hence transport between the two river banks will be serviced via the central station. However, in the long run, a new river crossing might become imperative, for instance in the case of dense urban development around the railway loop on the East bank.

Although the RPMP does not include extensions of the rail network in Riga and Pieriga, it does include several measures for improvements in the existing rail network:

- replacement/repair of wooden sleepers (PT4);
- reconstruction of several crossings and development of safety systems (RD19, RD29);
- update of the electrical system and the signalling system (RD19, RD29);
- increase of platform heights to improve accessibility of trains and to reduce necessary waiting times at stops (PT5, PT6).

In the RPMP investments a budget is included for repairs and replacements. Furthermore, improvement of the accessibility of trains and platforms is part of the set of PT measures. An important aspect related to the rail infrastructure is the safety at railway crossings. In 2008 27 people were killed in accidents at railway crossings in Latvia. Of the 709 level crossings of the Latvian railways only 68 were attended in 2006. Therefore, the RPMP includes a program to start up the installation of automatic protective barriers at level crossings (PT5). First, an investigation of these crossings should be made to prioritize the installations. The program should start at the crossings with the largest traffic volumes and the largest accident rates.

4.3. Freight truck routing

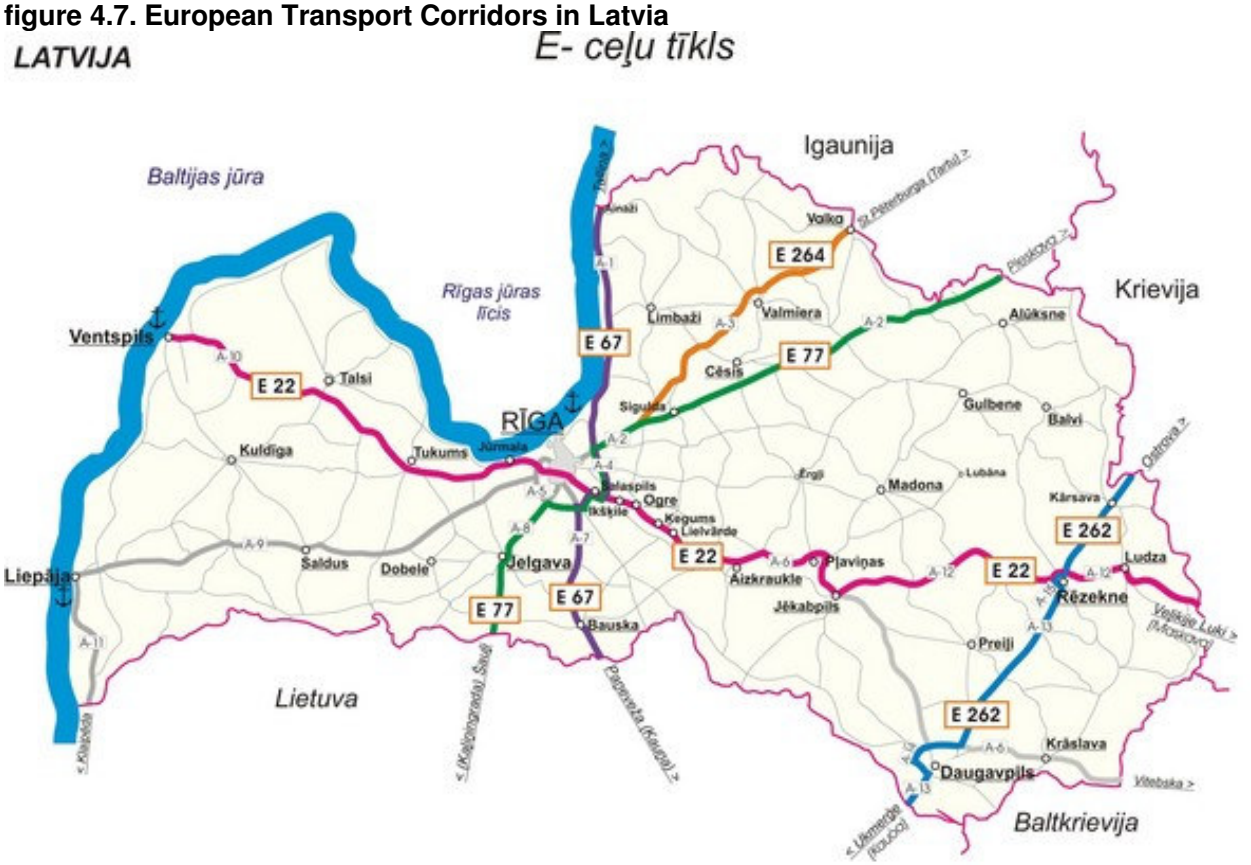
Improvements of the connections between the Riga Freeport, Riga and other national and international (TEN-T) transport infrastructure networks are of great importance for economical development of Latvia. More specific for Riga one of the main issues with road freight traffic is the hindrance caused by trucks in populated areas.

freight traffic at a regional and national level

Three main road transport corridors cross Riga and Pieriga (as shown in figure 4.7). The E67 or 'Via Baltica' connects the Baltic states with Southern and Western Europe. The E77 is a north-south connection as well and provides a connection to St. Petersburg. Both the E22 and the E77 are access roads to the TEN-T network. The E22 is a west-east connection and provides a road connection from Ventspils to Russia and further on to the European-Asian transport corridors.

Freight traffic on the E67 and E77 currently crosses the Daugava river at the HES-dam or travels via the city of Riga. There is no direct connection from the A4 to the A5. This is considered as an important missing link in the north-south related European transport corridors. For international (transit) transport and for improving the connection of Latvia to the TEN-T network, this route is of value for the longer term when the number of freight trucks increases. For traffic with an origin or destination in Riga and/or Pieriga, especially after connecting the Southern bridge to the network, this route will remain of limited importance in the short term. Therefore, the project is considered as a long term project for the period after 2025. The A4-A5 connection factsheet and the fact sheet on road usage by trucks in appendix I present the analyses that support this recommendation.

figure 4.7. European Transport Corridors in Latvia

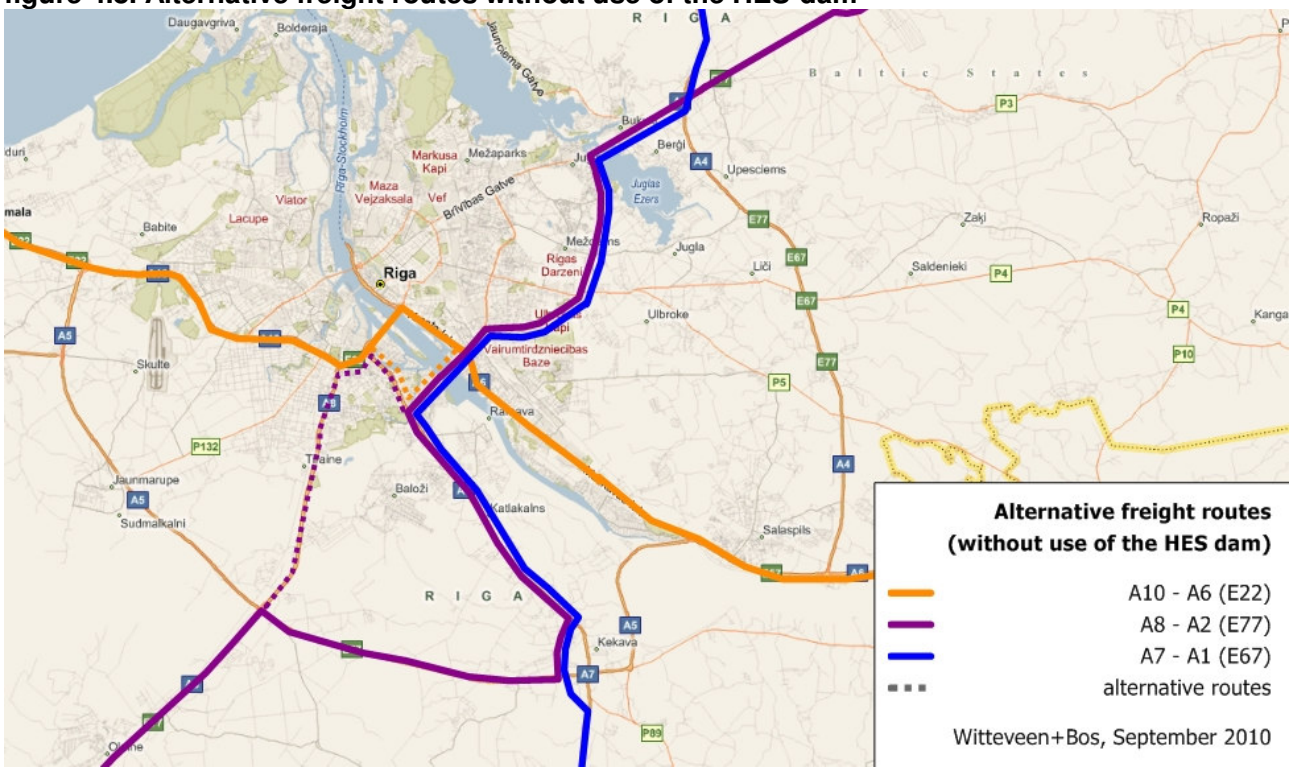


rerouting of transit freight traffic in the RPMP period

The HES dam and the future NTC are strategic connections in the freight route network. However, the NTC will not be operational before 2025. Furthermore, the HES dam will be replaced by a new A4-A5 connection in the period after 2025 and will not be able to facilitate all freight traffic till replacement. Therefore, in the period till 2025 the freight traffic will use routes via existing river crossings in Riga and Pieriga. Transit freight routes for the first implementation period of the RPMP will use the HES-dam and the Southern bridge to cross the Daugava river. Especially for the E67 (Via Baltica) and E77 (A8-A1) this seems logical, for the E22 route the Salu bridge is an alternative.

There is a possibility that within the RPMP period the HES-dam might no longer be available as river crossing for freight traffic, due to the vulnerable construction. If so, the E67 and E77 routes will be diverted to the Southern Bridge. This will lead to an increase of freight traffic in some populated areas as can be seen in figure 4.8.

figure 4.8. Alternative freight routes without use of the HES-dam



freight traffic within the Riga boundaries

Approximately 40 %[7] of freight truck movements within the boundaries of Riga is crossing the Daugava at the Akmens, Salu or Southern bridge[8]. Another 40 % of freight truck movements stays within the boundaries of Riga but is not crossing the Daugava. Only 13 % of freight truck movements has an origin or destination outside Riga and 7 % is transit freight traffic. Freight traffic is strongly related to the port area although there are also substantial industrial zones located close to the railway circle at the right bank and between Dreilini and Mezciems.

With the ongoing development of the port areas and the relocation of Andrejsala and Eksportosta activities to Krievu Sala and Kundzinsala, part of the freight traffic will shift to other locations. For Krievu Sala (left bank) till 2020 the majority of transhipped goods will be coal which is mainly transported by rail. After 2020 an increase of general cargo which is transported by truck is expected at Krievu Sala. At Kundzinsala (right bank) an increase of container transport up to 15 million tons per year is foreseen, which will lead to an increase of truck freight traffic in the coming period.

Currently, there are two main north-south transport axis used by the trucks situated closely to the river Daugava:

- at the right bank: Ganibu dambis - Eksportosta iela - 11. novembra krastmala - Krasta iela;
- at the left bank: Daugavgrivas iela - Ranka dambis - Mukusalas iela.

At the right bank the Pernavas iela serves as an alternative route and at the left bank the Kleistu iela is an alternative for the Daugavgrivas iela.

7 Source Description of existing transport situation or the Spatial plan of Riga for 2006-2018, Imink/RCC, 2005

8 Depending on the traffic situation, RCC prohibits freight traffic to use the Akmens bridge.

right bank, first priority
The main freight truck origin and destinations are located on the right bank of the Daugava river. Therefore the completion of the Eastern Arterial route from Viestura Prospekts to Slavu iela has a high priority in the RPMP and is included in the action program for the first period. The completion of the Eastern Arterial will help to relieve the city centre and especially the Old Town from freight trucks. Apart from this it will ensure a better freight traffic flow compared to the present situation since the existing route with traffic lights and ground level railway-crossings is replaced with a route with a few traffic light controllers and bi-level railway-crossings. This ensures a better connection of the right bank port area to the Via Baltica A7/E67 to Western Europe.

The first stage of the Northern Transport Corridor is planned for the first implementation period as well and will improve connection of the right bank port activities to the Northern part of the Via Baltica. Therefore, this project has substantial value in improving the connection of the right bank port area to the TEN-T network, even without actual completion of the Northern Transport Corridor after 2020.

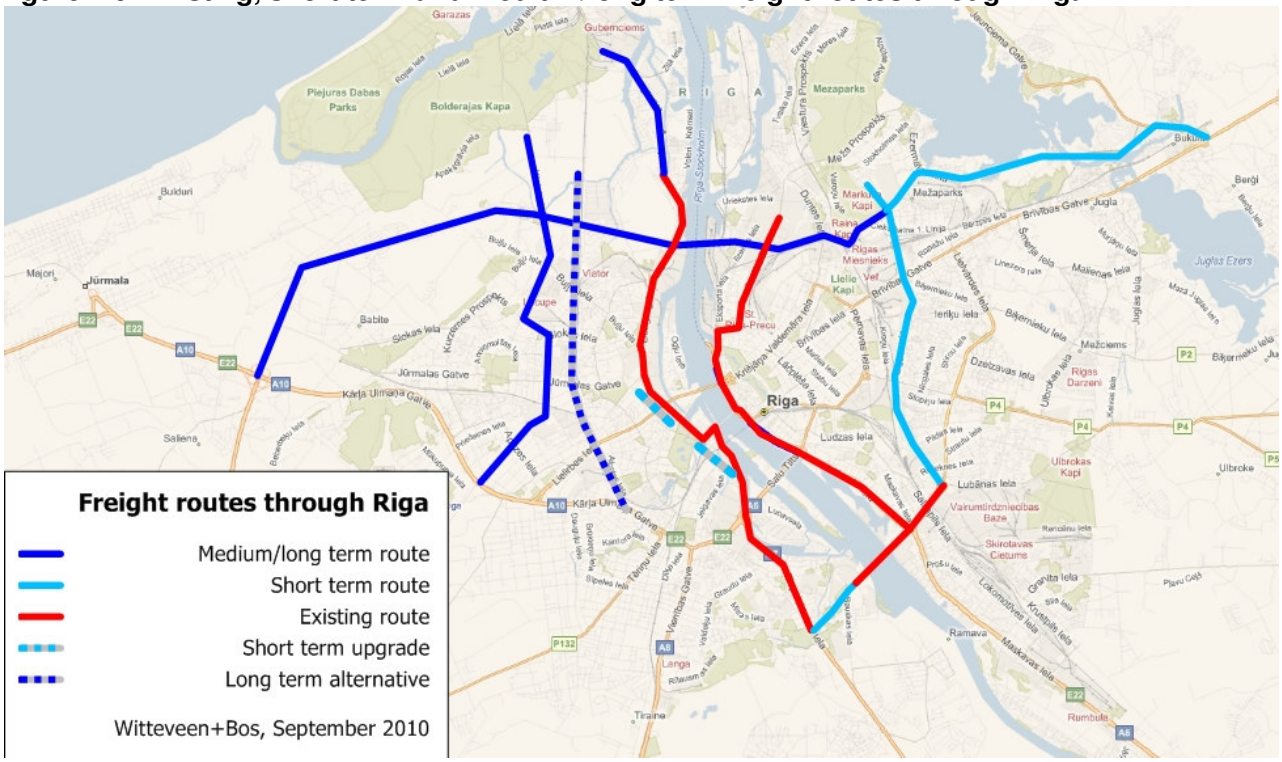
left bank, second priority
The second important growth location of the port is caused by development of Krievu Sala port infrastructure and further development of port activities at Daugavgriva. Currently the main access routes to these areas are the Daugavgrivas iela and the Kleistu iela, with a focus on the Daugavgrivas iela. Bottlenecks on this route are the city side part of the Daugavgrivas iela and the connection at the K. Valdemara iela, mainly for southbound traffic. Furthermore, this route has a negative effect on liveability and the environment in the nearby residential areas.

The main vision of the RPMP is the need for a western tangential route connected to the NTC which is in line with the Kleistu iela via the Kurzemes prospekts to the Jurkalnes iela. An alternative to be studied is a bundling with the railway track to Bolderaja (both routes are indicated in figure 4.9). Such a western route together with the NTC will ensure a good flow of (freight) traffic, divert freight traffic out of the city centre and will decrease the number of freight trucks crossing the Daugava at the Akmens and Salu bridge and possibly the Southern Bridge. However, construction of the Western Arterial is not a measure which can be realized on the short term, but an improvement of the existing situation is desirable in the coming years.

As short term measure the reconstruction of the connection of the Daugavgrivas iela combined with the K. Valdemara iela is included in the action program (RD10s). This will improve traffic circulation especially in the more problematic southern direction, but is also of use for e.g. accessibility of Kipsala and passenger car traffic to and from the K. Valdemara iela. Hence, independent of the construction of the Western Arterial, it is considered as a useful measure.

The other bottleneck to be solved is the connection between the Ranka Dambis and the Mukusalas iela. In the future RPMP transport system this route is relieved by the construction of a Western arterial route. However, on the shorter term an improvement of the route along the Daugava is necessary. This will be established by constructing a tunnel, at the same time catering for new urban developments in the area Technical design for a tunnel between the Ranka Dambis and the Vienibas gatve has already been made by RCC, including cost calculations and arranging financial support from the ERDF. Therefore, it is likely that this connection will be constructed in the coming years and will provide a better connection of the left bank port area to the TEN-T road network together with the previously mentioned project. The tunnel has been included in the action program as part of project RD10s.

figure 4.9. Existing, short term and medium/long term freight routes through Riga



study projects

Related to freight traffic there are two study projects currently in process. In table 4.5 these projects are described and their relation to the RPMP is given.

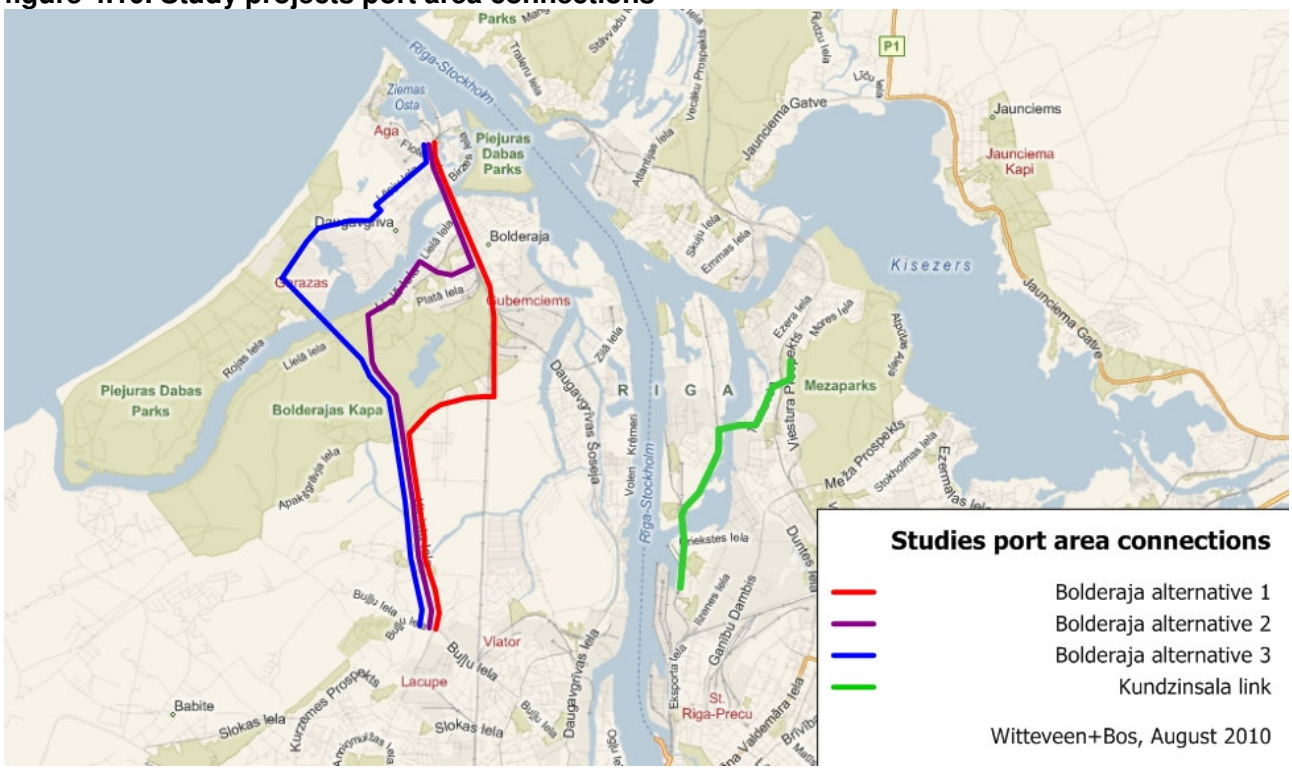
table 4.5. Study projects port area connections

project name	**Kundzinsala link (purple in figure)**
description/goal	A specific additional project which is currently studied together by RCC and the RFA is the 'Kundzinsala link' . As described before, relocation of port activities from Andrejsala and Eksportosta leads to an increase of approximately 15 million tons of container transshipments at Kundzinsala and thus an increase of freight traffic. At the same time the route is studied for increasing the accessibility of residential areas like Kundzinsala, Sarkandaugava, Aplokciems and areas further north. Upgrading of the Tvaika iela to a 2x2 lane street connecting to the Ganibu Dambis can be seen as an alternative to be studied. Both alternatives are connected to the future Northern Transport Corridor, but at a different location.
relation to RPMP	This project is included in the RPMP as study project. It is related to the relocation of port activities out of the city centre which leads to extra shipping of general cargo at Kundzinsala. Furthermore, this study is meant to improve the connection of the Northern port areas on the right bank to the centre of Riga. The outcome of the study should indicate whether such a link is feasible for implementation in the second implementation period.

project name	**Bolderaja link (red in figure, alternatives are dotted)**
description/goal	There are plans to turn the existing Daugavgrivas iela (north of the NTC) into an inner port road, since the port traffic is expected to increase in the next years and the existing traffic circulation at the Daugavgrivas iela is affected by congestion. The Kleistu iela is considered to be the main access road for the Bolderaja / Daugavgriva neighbourhoods.

relation to RPMP	This project supports the Western Arterial vision in the RPMP, but is more or less in contradiction with the current plans to upgrade the Daugavgrivas iela, improve the connection at the K. Valdemara iela and the construction of a tunnel at the Ranka Dambis to support freight traffic on the left bank. Therefore, it must be seen in respect to the medium or long term construction of the Western Arterial and decision-making should be related to the decision-making of constructing a tunnel at the Ranka Dambis.

figure 4.10. Study projects port area connections



traffic safety

Improving traffic safety is one of the main objectives for the RPMP. In the last decade Latvia has made a substantial progress in improving traffic safety at main roads and the local or municipal street network. The Road Traffic Safety Directorate (CSDD) of the Ministry of transport has a leading role in Black Spot Analyses and traffic safety audits of e.g. design, construction or existing situations. The weakest points in Pieriga are intersections of local streets with main roads and pedestrian crossings at main roads[9].

The target of the Road Traffic Safety Program (2007 - 2013) is to halve the number of accident victims (till 280 in 2010) in comparison with year 2001 and to decrease the number of victims by 70 % (till 160) in 2013. The target for 2010 was already reached in 2009 when there were 254 fatal injuries. Compared to 2008 in 2009 the number of accidents decreased rapidly, probably also due to less traffic caused by the economic situation.

Given the current economical situation in Latvia, the budget for improving traffic safety has been reduced. However, there is still a lot of improvement necessary in the coming period. In order to do so, there is an additional budget for traffic safety of EUR 5.000.000,-- included in the RPMP action program for the first seven years. The main allocation of this budget is to improve traffic safety in Riga (RD19a)

[9] Based on results of questionnaire among Pieriga municipalities.

and Pieriga (RD29a) and should be administrated and prioritised by the MoT (and CSDD), based on the annual black spot list and traffic safety audit advices. The annual budget is EUR 715.000,-- This budget is meant to subsidise quick win measures and not for large reconstruction projects. In appendix I a fact-sheet with quick wins for traffic safety is given.

4.4. PT network Riga

A set of measures has been developed to create an attractive and more efficient public transport system. The measures are estimated to lead to a growth of approximately 18 % in use of public transport compared to the reference situation. The focus lies on creating corridors, served by high frequent connections that have a travel time which is competitive with travel times by car. Another goal is to decrease the parallelism between bus lines, trolley bus lines and tramlines. To achieve the objectives important conditions are:

- a complete and coherent network of dedicated PT infrastructure in congested areas to increase the travel speed of PT;
- financing of costs for both infrastructure and operations;
- marketing of the entire public transport network;
- changing the tariff system to an integrated system for all PT modes without a penalty for transfers.

This section presents the PT networks for Riga. More detailed information is included in the measure tables and factsheets in the appendices. Appendix VI gives an overview of all PT measures in the RPMP. Fact sheets for several PT aspects are included in appendix I. References to the ID numbers of measures in appendix VI are given in the text.

tram network

Passengers prefer the tram to travel with above the other modes. The tram network will be redesigned to further increase the attractiveness and efficiency of this system. The tram related measures are estimated to result in a 20 % increase of average travel speed. The current radial network will be (partly) transformed into a transversal network[10] to create more direct routes and to reduce the need to transfer for passengers. Table 4.6 and figure 4.12 give an overview of the future tram network.

figure 4.11. Example: tram from airport to city centre in Bremen (Germany)

The new tramline to the Airport (RPMP line 1, replacing current line 2, measure PT12) enables a good connection from the Airport to the central station and the city centre. This line will also attract passengers in the areas served between the airport and the Riga city centre. The redirecting of tramline 2 from Tapesu iela towards the Airport reduces operation costs. This enables the operation of an attractive tramline to the Airport. Passenger volumes from the airport alone are not enough for operating a frequent railway line with trains. Also travel times by rail will not be shorter than by tram and a railway offers less direct connections to the city centre. A tramway is therefore the best alternative for the existing bus line 22. Examples of successful tramlines to the airport can be found in several cities, as in Bremen, Germany and Lyon (France). The tramline from the airport will be connected to the existing

10 In a transversal network tram lines do not terminate at the central station in the city centre, but pass this station and continue to another end station. With a transversal, compared to a radial network, more direct routes can be created. Furthermore, a benefit of a transversal network is that no turning points are necessary at the main tram stop in the city centre, reducing the need for space.

tramline to Jugla, which is the first line to be operated with the new low floor trams. In the RPMP this line has the highest priority to be improved.

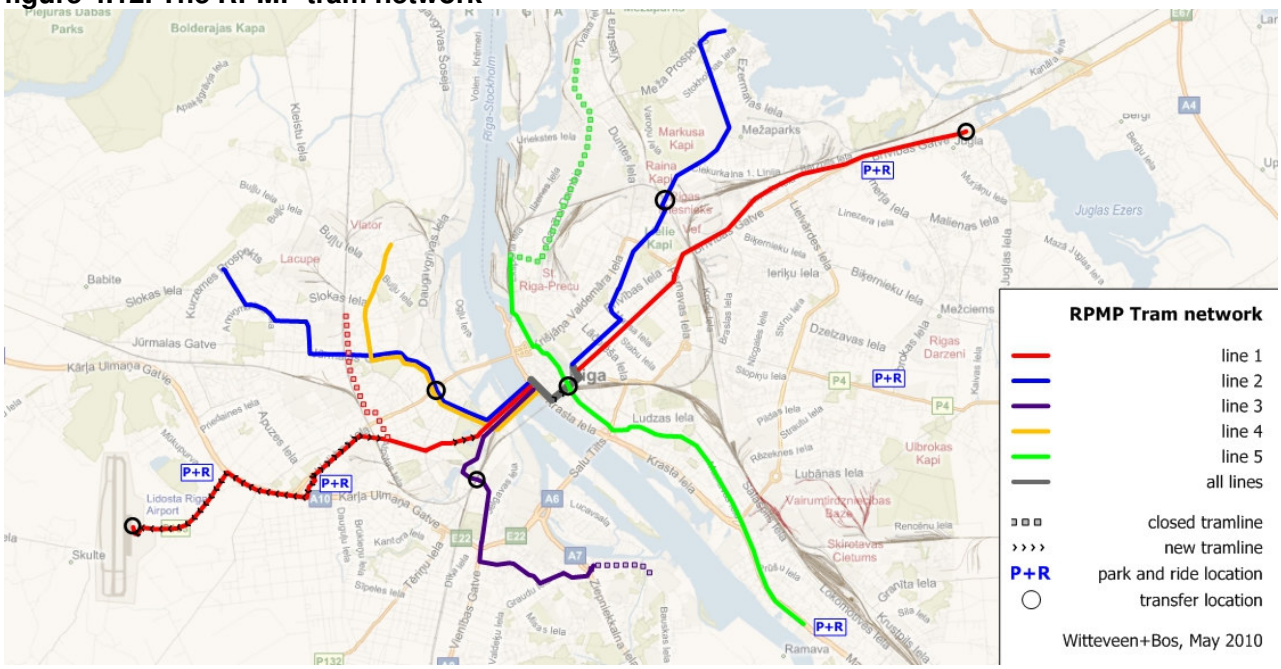
The current tramline 5 between Ausekla iela and Milgravis will be closed when renewal of the existing tram infrastructure becomes necessary (PT8); the demand for this line is limited and with bus line 2 and a short extension of trolleybus line 3 (towards Aldaris, PT25) a good and efficient alternative can be given. On Ganibu dambis the existing space of the tramway tracks can be changed into a separate bus lane for bus line 2 (PT27). The current tramline 7 (RPMP line 5) will be extended over a short distance to the Passenger Terminal and the new developments in the port area (PT14).

Tramline 4 from Imanta to Central Station will be combined with tramline 11 to Mezaparks enabling direct connections from Imanta to the city centre (RPMP line 2). Because of different transport volumes on these coupled lines it can be necessary to end some services from Imanta in the city centre near Brivibas iela. Current tramline 10 will be shortened from Bisumuiza to a new terminal at Ziepniekkalna iela (RPMP line 3, PT8). On the longer term, this line can be rerouted to Ziepniekkalns while replacing the existing trolleybus line 19. The extension of the current line 6 to Bergi has not been included in the RPMP, because of the expected poor cost-benefit ratio. It is recommended to give priority to the other PT measures. The necessary rolling stock capacity for the tramlines is calculated in appendix IX.

table 4.6. Description of the RPMP tramlines

tram	from	to	headway (peak)	runtime (min)	Rolling Stock	remarks
1	Jugla	Airport	6	57	22	route between station and airport
2	Mezaparks	Imanta	6	55	22	combination existing lines 4 and 11
3	Ziepniek-kalna iela	Centrala stacija	10	27	8	shortened route of existing line 10
4	Ilguciems	Stacijas laukums	10	28	8	part of the route of existing line 5
5	Dole	Andrejsalas Passazieru osta	6	31	14	extended existing route of line 7

figure 4.12. The RPMP tram network



trolleybus network

The existing trolleybus network is mostly modern and dense. Trolleybuses have large benefits for the environmental impact in the city and comfort for the passengers, although the current speed is too low (approximately 16 km/h). In the RPMP the focus lies on using the existing trolleybus facilities and rolling stock and on redesigning the network to increase attractiveness and efficiency where possible. This can be achieved with more transversal lines (direct connections), extensions of the trolleybus network, reduction of parallelism with the tram, dedicated infrastructure and priority at intersections. The redesign of the network will lead to a reduction in the number of trolleybus lines and an easier understandable network. The lines will be renumbered to realize distinctive numbering for tram, trolleybus and bus lines.

Table 4.7 and figure 4.14 give an overview of the future trolleybus network. The Brivibas gatve and Vansu bridge are important axles within this network. Extensions of the trolleybus network on these axles will enable a reduction in the number of buses and minibuses in the city centre. Towards Mezciems and Plavnieki the trolleybus will remain the main mode of transport. A new tram line would require too high investments for the period till 2025.

The RPMP recommends a new trolleybus stop near the Hospitalis at Upes iela to avoid the necessity for all services to drive to Aldaris. Furthermore, improvements at the train crossing at Sargandaugava are included, to reduce waiting times here (PT27).

figure 4.13. Example of a transfer point between bus and tram in Bremen (Germany)

Trolleybus line 3 will be extended from Sargandaugava (Draudziba) to Aldaris (PT25) and is combined with trolleybus line 19 into the new transversal RPMP line 19. Trolleybus line 4 will be extended from Smerlis to Jugla-3 for half of the services. This line forms a new transversal line 14 together with existing line 27 towards Ilguciems. Bus line 40 can then be eliminated between Jugla-3 and Ziepniekkalns. Passengers from Jugla-3 to the central station can use the new trolleybus to the tramline and change to the tram.

The route of trolleybus line 18 (Central Station – Mescziems) will be changed via Purvciems and Dreilini to Mezciems (PT26). A dedicated bus lane is planned in the RPMP between Purvciems and Hippocrata iela (PT26). By extending trolleybus line 18 to a new terminal at Motoru Muzejs (Mezciems) bus line 5 can be eliminated. Trolleybus lines 11 and 27 will be combined to a new trolleybus line 11. Line 9 will be eliminated because of parallelism with the tram between Ilguciems and central station. The necessary rolling stock capacity for the trolleybuses is calculated in appendix IX.

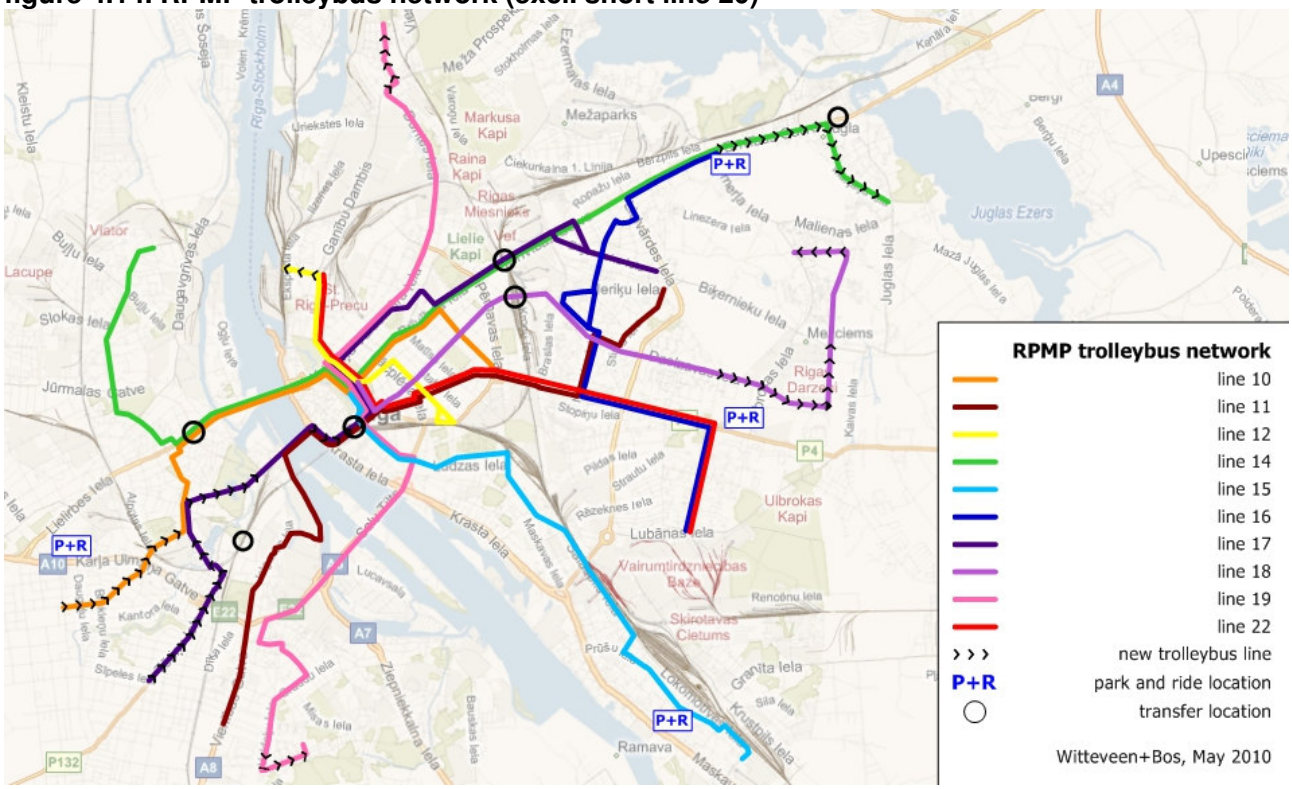
There are plans for a tunnel under the railway tracks between Gertrudes iela and Daugavpils iela. This would make it possible to improve the connection between the Institutions and the city centre. Existing trolleybus line 1 (line 12 in the proposed network) can be extended then. This tunnel however is not part of the RPMP.

table 4.7. Description of the RPMP trolleybus lines

Trolleybus lines	from	to	headway-peak	number of trolleybuses
10	Upesgriva iela	Daugava	8	12
11	Abolu iela	Ieriku iela	6	20
12	Andrejosta iela	Valmieras iela	8	8

Trolleybus lines	from	to	headway-peak	number of trolleybuses
14	Ilguciems	Jugla-3	6	22
14	Ilguciems	Smerlis	6	16
15	Latvijas Universitate	Viskus iela	4	19
16	Smerlis	Katlakalna iela	8	11
17	Marupe	Keguma iela	8	15
18	Centrala stacija	Motormuzejs	4	22
19	Ziepniekkalns	Aldaris	6	22
19	Ziepniekkalns	Hospitalis (Brasa)	6	18
20	Latvijas Universitate	Televizijas centrs	20	3
22	Petersalas iela	Plavnieki	4	22

figure 4.14. RPMP trolleybus network (excl. short line 20)



bus network

The changes in the bus network are limited in comparison to the other PT modes. The most important measure is the elimination of several bus lines which are parallel to the tram or trolleybus lines over longer distances (bus line 5, 6, 7, 22, 25, 40, 41 and 42) and the provision of clear, fixed timetables. These changes must be worked out together with the proposed changes in the tram and trolleybus lines. For example bus line 40 from Ziepniekkalns to Jugla 3 is a heavily used bus nowadays: it can only be replaced after the improvement of the trolleybus lines to Ziepniekkalns and Jugla-3. In other words: the changes in the bus network must logically follow the changes in the tram and trolleybus network.

Furthermore, several bus lines with low frequencies will be replaced by non direct connections with tram and trolleybus lines and shortened to new transfer points where passengers can easily transfer from bus to train, tram and/or trolleybus as indicated in the preceding sections.

Multi modal transfer points (PT16)
Transfer points where passengers can easily change from one line to another are an essential part of a more hierarchic PT network. On these transfer points it should be easy for people to change modes and lines. This means that a transfer point must meet the following requirements:

- recognizable as transfer point;
- passenger information about connecting lines;
- short and safe walking distances between connecting lines;
- waiting comfort (shelter, seating, lighting, social security);
- when lower frequency than every 10 minutes: secured connection between lines (vehicles waiting for each other when delayed).

Transfer points between bus and tram or train can also help to reduce the number of buses driving to Riga central station, thus helping to reduce negative impacts of these buses and reducing the space needed for a bus terminal near Riga station. Transferring people from bus to train or tram is only acceptable when people have no significant longer travel time despite the need to change and do not have to buy an extra ticket for the last part of the trip. Transfer points can be combined with P&R facilities. In Riga transfer points can best be realized in combination with an upgrade of the tramway network. Transfer points between regional buses and the PT network in Riga can best be situated along the tramway network:

- Jugla (or Alfa): All regional buses coming from the A2 corridor that have not been connected on a station in Pieriga (e.g. Sigulda) can end here except long distance Intercity buses, like to Tallinn and Sankt Petersburg (because of large amounts of luggage). When tramline 6 to Bergi will be extended, the transfer point should be made there;
- Dole: All regional buses from the south east part of Latvia (A6 and A7 Corridor Daugavpils, Rezekne, Ergli, Ogre) when not already connected to or ended in a station in Pieriga can end here, except long distance buses (used by people with large amounts of luggage);
- Spice and later also Airport Messe: All regional buses from the west and south west part of Latvia (Jurmala, Ventspils Saldus, Liepaja) when not already connected to and ended in a station in Pieriga can end here, except long distance buses (used by people with large amounts of luggage);
- Tornakalns station: Some regional buses from the south part of Latvia (A8 Corridor Jelgava, Auce, Eleja) when not already connected to and ended in a station in Pieriga can end here, except long distance buses (used by people with large amounts of luggage).

The planned location of a new bus station near Skanstes iela is not within short walking distance connected to a tramway and/or trolleybus line to the city centre and has an eccentric location seen from the city centre. Due to these characteristics passengers will have a longer time if they travel by bus to this station and have to transfer, than travelling directly by bus to the city centre. On the longer term, after realization of the NTC, this location could be an option for buses from the west and east because of a much shorter travel time from the road corridors to east and western Latvia by using the NTC.

All train stations within Riga will be subject to study to become end stations for bus services from Pieriga. One of the stations nominated is Tornakalns, where new urban development will take place (e.g. University) and RPMP tram line 3 will stop. Others are Brasa (P+B, stop RPMP tram line 2) and Zemitani (P+B, stop RPMP trolleybus line 18). Upgrade and development of transfer points is one of the measures for the first RPMP period (PT16).

water transport
In several cities all over Europe, such as London, Hamburg and Rotterdam water transport has been introduced successfully. However, water transport is rather expensive: roughly two or three times as expensive as operating a bus or tram system. The main success factor is to provide faster connections. This is possible if other modes need to travel longer distances because of the need to use bridges.

River crossings in most cities, like in Riga, are congested. On the other hand, in Riga there are a lot of PT lines crossing the Daugava River.

A disadvantage of public transport over water is that a connection to land modes is often difficult: it is not possible to connect water transport to important origin or destinations that are not directly situated at the riverside. In the Netherlands many people use their bicycles to travel the distances between the waterbus stop and their homes and destinations. In Riga and Pieriga this is only possible during the summer months. Another problem in Riga and Pieriga is that the Daugava River is frozen several months each year. This means that a water transport system can not be operated the entire year. Water transport could be attractive in the warmer season, but will then mainly attract tourists and people using it for social recreation. For the short or medium term water transport is not considered feasible to be implemented in Riga and is therefore not part of the RPMP.

minibus (PT19)
Many minibuses are operated in Riga and from Pieriga to Riga. Their market share in public transport is around 8 %. The minibus network should be adapted in line with the principles of the overall public transport network. The main objective for minibuses is to provide a connection between suburbs and transfer points in the suburban areas (suburban connection between housing areas and the public transport network). The second goal of the minibuses is to provide a direct connection between (sub) urban destinations where there is no direct connection provided by the public transport network. The minibus system should be changed to a feeder system for the other PT systems instead of being a competitive system to the city centre. It is recommended to start a feasibility study for changing the minibus system in the first RPMP period.

Park and Ride (PT20)
The Riga City Council focuses on combining Park and Ride (P+R) and additional facilities like shops, kindergartens and schools. International surveys show that P+R can benefit from additional facilities but only if these facilities are additional to a good located and well used P+R. Creating shops at a wrongly placed P+R can turn it into a parking lot instead of a P+R and can even lead to an increase in car traffic.

figure 4.15. P+R location

The expectations for P+R are modest. The main reason is that currently travel times by public transport are not shorter but probably even longer than by car. Therefore, successful development of P+R facilities in Riga is only possible with corresponding investments in public transport priority systems at traffic lights and exclusive infrastructure at congested routes. The second main precondition for P+R, a lack of parking places or expensive paid parking at the destination, exists in Riga. It is recommended to start with a few relatively small P+R pilot project in Riga:

- Spice (500 parking places): after realisation of the new tramline to Riga Airport, on the longer term a larger P+R can be realised near the planned Exhibition Centre that will be realised in cooperation with the Frankfurter Messe;
- Alfa (500 parking places): near the terminal Smerlis (trolleybus lines) and a tramway stop of the new tramline Jugla – Central Station – Airport;
- Dole (near Rasa's iela): (500 parking places) at small extension of tramline 7;
- Dreilini (250 parking places, extendable until 500): near Saharova iela.

After proven success at these locations the lessons learned can be used to create new Park and Ride locations e.g. at Rumbula, Brivibas gatve near Jugla and Mangli train station. Supporting measures like

a clear marketing concept for P&R are necessary. Some locations around the railway loop have potential for Park and Bike, see figure 4.7 for the Park and Bike locations included in the RPMP.

4.5. PT network Pieriga

The philosophy for Pieriga is to use the existing train network as the backbone for transport and spatial development. Essential for an attractive train system is the introduction of faster regional connections with regular intervals and easy to remember departure times. Furthermore, the focus is on good access to and from the train stations and the tram stations on the outskirts of Riga.

train network

The accent for the train network is on moving people between Pieriga and Riga; inside Riga people use non-motorised transport or the dense and frequent network of tram, trolleybuses, buses and minibuses. The train network will be redesigned to a fast metro-like system, operated as 'Sprinter' with a clear network and timetable with regular intervals of 30 minutes or more frequent.

To attain shorter travel times, the elimination of speed restrictions is included as RPMP measure (PT3). Furthermore, additional measures are necessary to improve the rolling stock, accessibility of the trains and stations and the connection to car and other PT modes, including Park and Ride facilities (PT5). Rolling stock is a responsibility of the PT companies. Information regarding the necessary rolling stock capacities is included in appendix IX. The Pieriga train network is operated with electric trains. On not-electrified lines, diesel trains can be used, although it could be considered on the longer term to use hybrid trains that are able to drive in an electric mode where catenaries are available.

The future train network is based on the existing electrified lines from Riga to Tukums, Jelgava, Aizkraukle and Skulte. As a backbone of the Pieriga transport system, this serves passengers in a fast way to travel from suburbs in Pieriga to Riga. Closure of stations with very few passengers (e.g. less then 100 per day) is recommended. This leads to shorter travel times for most passengers and decreases operation costs and investments in platforms (lengthen up to 162 meters) and stations. A renewed railway station Riga Tornakalns nearer to new developments on the Daugava West bank is proposed in line with the Riga city development plan. The measures related to the train stations are elaborated in the corresponding factsheet in appendix I.

In order to attain shorter travel times by train on longer destinations a Regional Express (RE) service will be introduced. This RE has fewer stops than a so called Sprinter train, which has short stops on all stations. A reactivation of the line to Ergli is not included in RPMP, since the potential demand for this line has been considered too small. Also, reactivating of the connection from Skulte to Limbazi is not included, due to the expected high investments for reactivating and relatively low perspective for the number of passengers. Figure 4.16 and table 4.8 give a description of the RPMP train services.

figure 4.16. RPMP passenger train network

table 4.8. Train network RPMP

line number	from	via	to	headway peak hours	headway Off peak	status	number of train compositions
RE1	Tukums	Kemeri, Sloka Melluzi, Riga Tornakalns, Riga, Salaspils, Ogre, Lielvarde	Aizkraukle	30	60	Regional Express (RE)	5 electric
S1	Sloka	Riga, all stations	Ogre	30	30	Sprinter	6 electric
S2	Jelgava	Riga, all stations	Saulkrasti / Skulte	30	30	Sprinter	8 electric
S3	Riga	Incukalns, all stations	Sigulda	30	60	Sprinter	10 diesel

Remarks for the train network:

- RE1: this Region Express can be extended outside the RPMP area to Krustpils and Daugavpils in the east, for example every hour in peak hours and every two hours in off-peak periods (6-8 trains per day/direction). Instead of routing all trains to Daugavpils it can also be considered to have an alternating service to Rezekne or offering a connecting train from Aizkraukle;
- RE1: with stops on stations with larger passenger flows these stations will have 4 trains per hour in peak hours to and from Riga;
- S2: the current terminal of this line is Skulte; although Saulkrasti is the last station with a lot of passengers. Line S2 has a frequency of 2 trains per hour of which in off-peak hours only one train per hour ends in Skulte;
- S3: extension outside the RPMP area to Valmiera and Valga in the north can be considered, for example every 60-120 minutes (6-8 trains per day/direction).

regional bus (PT28)
Regional buses have an important function for Pieriga. With increasing car ownership it will become more difficult to operate a dense public transport network in Pieriga. On the important corridors to Riga where investments in the train system make this more competitive to car and (mini)bus lines, direct parallel lines of (mini)bus and train should be avoided. This means that the public transport authority should be restrictive with transport concessions for regional bus on the following corridors:

- Tukums – Riga Central Station;
- Sloka – Jurmala – Riga;
- Aizkraukle – Riga;
- Skulte – Riga;
- Sigulda – Riga.

The connections of the regional bus network to the train system should be improved. This is necessary to create a cost-effective train system. Villages in Pieriga that are currently only served by bus should get a faster connection to Riga via a transfer on the train system. This is only possible after the planned upgrade of the railway network. Nowadays many bus connections are faster than the corresponding train, e.g. Tukums – Riga or Sigulda - Riga. Creating transfer points with an easy transfer from bus to train and vice versa also leads to a more efficient network. Villages in Pieriga not directly situated at one of the railway lines can benefit from a faster connection to Riga and at the same time support the train system by increasing its usage. This in return will enable an increase in train frequencies.

transfer points between bus and train
A direct link between regional buses and trains should (at least) be realized at the following stations: Aizkraukle, Ogre, Sigulda, Jelgava, Tukums, Sloka, Majori. Not all buses will be redirected to another station instead of Riga. A new routing, including a transfer from bus to train, must be faster than the direct route. A feasibility study is necessary to study the possibilities. These transfer points can be of great importance for the municipalities in Pieriga: improved shuttle buses or existing bus lines, connected to these stations can shorten travel times for commuters and students travelling to Riga. This must be further studied as described in the Fact sheet public transport system of municipalities of Pieriga, with Tukums as an example.

For an optimal alignment between regional bus and train, the operation of the regional network should fit the following conditions:

- there must be an integrated schedule, with bus and train connections;
- there must be an integrated tariff system, so switching from bus to train can take place directly;
- there must be a comprehensive and integrated public transport authority (PTA) – see chapter 6.

The measures also do include an improved and more comfortable bus station in central Riga, on the east side of the central railway station. Plans for more bus stations around the city centre are in line with the RPMP. Within the RPMP the regional bus network is studied on headlines. It is recommended to start a comprehensive study on the short term (till 2017). This study should focus on the integration and alignment opportunities in the regional bus network. The network plays a significant a role in long-distance traffic. This should be visualized well before detailed steps can be further elaborated.

Park and Ride (PT1)
In Pieriga origin P+Rs already exist at various locations at train stations and/or regional bus stations, although it is not called Park and Ride. This type of P+R is already popular in Sigulda, Ogre, Aizkraukle, Iecava and Tukums. The city of Jelgava is surprisingly missing in this list. Typical for origin Park and Ride is that they are formed spontaneously. The Park and Ride strategy for these locations is enlarging the capacity if necessary, facilitating the existing parking lots with additional measures and promoting them with a marketing campaign. This type of Park and Ride is considered to be of most importance for improving regional accessibility and is not very expensive to create. The locations at railway stations

should be combined with bus stations where buses are terminating, collecting and delivering passengers from and to the railway corridors.

The first step will be to create P+R facilities at busier stations and to enhance the P+R facilities at already used lots at other stations. Locations for short term implementation are Saulkrasti, Lielvarde, Sigulda, Ogre, Sloka, Aizkraukle, Iecava and Tukums. For the longer term the following locations are nominated: Adazu, Marupes, Kekavas , Carnikava, Lielvardes, Malpils, Krimuldas, Kokneses, Ikskiles, Stopinu, Skriveru, Olaines, Adazu, Baldones, Sejas, Limbazu, Incukalna, Ligatnes, Ropazu, Garkalnes, Keguma, Salaspils , Vecumnieku, Ozolnieku, Babites, Engures districts, Jelgavas region and city and Jurmala city. Appendix 1 includes a fact sheet on P+R with design issues.

spatial and public transport development in Pieriga
Although spatial policy has been regarded as outside the scope for the RPMP, it is undeniable that transport and spatial development are interlinked. Better accessibility of Riga stimulates the settlement of new dwellers or at least tempers a decline in residents, because jobs and services stay more in reach. In turn, a situation with more residents attracts more services or prevents closure of services nearby. In this way accessibility is considered to be an essential component of liveability. In the Regional Development Strategy for Pieriga an important objective is to keep the rural areas liveable and vibrant. Providing good accessibility is thought to play a key role in this. The question is, however, what strategy needs to be pursued to match accessibility with local needs and to safeguard or improve liveability. Since budgets are limited, a specific question is how public transport can be applied to facilitate the necessary accessibility.

In order to get more grip on the issue, an Internet questionnaire has been released among residents of Pieriga (distributed via draugiem.lv). The final sample contained more than 400 respondents. The survey seeked to understand the relation between the (objective) accessibility of Riga, the proximity of services and the perception of liveability. In general the results showed a clear relation between satisfaction with proximity of services and satisfaction with the liveability. For assessing the relation between satisfaction levels and the accessibility of Riga, the respondents were grouped according to the area they live in, based on the amount of trip making to Riga. Three functionally different areas appeared:
- satellite areas. These are areas with a strong orientation toward Riga, mainly in the immediate vicinity. The quality of life is relatively good, but the accessibility of facilities is a concern, especially in the areas further away from Riga;
- independent areas: these are areas with a moderate relationship with Riga, predominantly located far from Riga. In the distant areas most people are satisfied with the proximity to services and the liveability. In the areas nearer by however, both issues are rated relatively low. Apparently, there are two types of independent areas. The strong areas on the one hand are often more remote villages that are considered to have sufficient critical mass to sustain local amenities. The weak areas are often villages nearer by, possibly facing a downward spiral with higher unemployment rates and population aging;
- transition areas: these are the areas that show scores inbetween the scores of the other areas. The areas close to Riga within this category show the lowest satisfaction levels.

From these findings we come to the following recommendations that can be used as a starting point for a study on optimising public transport (the bus system) in Pieriga:
- improvement of PT accessibility of satellite areas where there are real changes to improve the PT competitiveness. The rail system project, providing high frequencies of trains, is in line with this recommendation. This should invoke a modal shift to PT and will stimulate companies to relocate at PT junctions. It can finally lead to satellite areas becoming more independent, offering (service) employment to local residents;
- provision of better connectivity between weaker independent and transition areas on the one hand and strong independent areas on the other. This can be established with a high level-of-service bus-on-demand system. It is about improving the accessibility of services, safeguarding the quality

of life in the weaker areas and enlarging the catchment area of services in the regional centres at the same time;
- provision of better PT accessibility of transition areas that could transform to satellites with a higher degree of liveability, when travel times really improve. Since most transition areas do not contain a train station, the concept should be to provide high frequent and connecting bus shuttles to and from train stations in peak hours. The connection with the trains to Riga should be guaranteed. Since the car accessibility to Riga is in the case of transition areas not optimal, Park&Ride systems can be implemented to avoid commuters going all the way by car;
- allocation of new dwellings in the corridors of satellites that have a good PT connection with Riga, or next to strong independent areas. New housing in transition and weak independent areas is not recommended, because it might lead to further deconcentration, which also impedes the transition to sustainable mobility.

Finally, it should be noted that for conducting a study on the optimisation of PT to facilitate desired spatial developments data on travel patterns are necessary. Within the scope of the RPMP development it proved to be not feasible to gather such data from Pieriga.

5. RPMP SUPPORTING MEASURES

5.1. Traffic management

In the existing situation there are all kinds of local optimisations at many intersections to achieve a maximum throughput capacity. Examples are the temporary left turn prohibitions at e.g. the Valdemara iela and Brivibas iela. But also e.g. the green wave on the Valdemara iela at the right bank of the Daugava river. Furthermore, there have been experiments with traffic information services by private companies e.g. the travel time information on the internet. Latvian State Roads has developed a Traffic Information Centre to provide society with relevant road condition information. In other words, several initiatives have already been taken to implement traffic management measures.

It is suggested that, due to rapid developments in communications and IT-systems, it could be that most communication between 'roadside' and 'motorists' or travellers will be by smart phones or personal digital assistants (pda's), with applications for navigation, travel planning, incident information, actual travel times etc. The trend which is visible in Europe is that these developments are done by private companies as selling point for their smart phones, the role for the government is to provide already available data to these companies.

Related to the actual traffic and transport network there are no locations available on which variable message signs can be used to prevent or substantially reduce traffic overload. Minor benefits by slightly reducing queues can not be recognized by the public and will not bring any refunds to authorities (in comparison: even minor bus priority can reduce costs of exploitation). Therefore the installation of roadside VMS systems is not included in the RPMP. However it is advised to purchase mobile variable message signs for informing and diverting traffic e.g. in case of an emergency or large event.

For the period till 2025 there are a couple of additional traffic management measures included in this plan:

- implementation of public transport priority at public transport axes to improve travel speed which leads to a reduction of exploitation costs and increase attractiveness for travellers (RD18, PT27);
- implementation of adaptive traffic control in stead of fixed time control to improve flexibility (RD18);
- setting the basis for a traffic monitoring system (RD18).

Setting up a central network control system is considered as useful, but possible effects must not be overrated as recent examples in for example Vilnius show. Newly installed intelligent transport systems tend to show a lot of profit mainly due to the update of the transport system and only partly from the system itself. The main profit of a central control system will be in later years because it will automatically update the traffic control system based on actual vehicle counts instead of the current situation with manual local optimizations. The current situation in Riga is a network with a few isolated very severe problem locations and in the rest of the network sufficient capacity. Next to that traffic control on intersections is almost everywhere where profitable simplified by small measures like prohibited left turns, exit bans etc. Considering this situation, it is expected a central control system can raise the capacity a bit on the major problem locations. With basic measures as public transport priority and local adaptive traffic control there can be made a progress already. Next to this, the necessary vehicle detection system for adaptive control sets the basis for a central traffic control and monitoring system. In renewal of traffic light controllers, hardware preparations for including the traffic light controller into the central control system must be demanded for the suppliers.

implementation of public transport priority and adaptive traffic control (PT27)

Introducing public transport priority can increase travel speed of trams, trolleybuses en diesel buses especially when combined with dedicated infrastructure which is part of the public transport projects. At intersections with different patterns in demand for several directions, an adaptive traffic control system can increase the throughput capacity of the intersection and travel times of road users. At overloaded

intersections however, there is little or no effect to be expected for travel time gains by the traffic light controller itself, but in this case the public transport has benefits from the availability of dedicated bus lanes at e.g. the Brivibas iela. Another benefit of adaptive traffic control is the possibility to add exclusive (left) turns, which will only become green when there is a demand for this direction. Also, the green phase at major directions can be finished when the main stream has ended, starting left turning traffic from the other direction that will not be confronted any more with suddenly appearing vehicles which have to be given right of way. Both measures will improve traffic safety. They can also be used for giving priority to emergency vehicles on dedicated routes. The basic principle of public transport priority systems and adaptive traffic control are described in the corresponding factsheets in appendix I.

In Riga in recent years there have been some experiments with different detection technologies. The outcome of these experiments is that systems like loop detection or infrared camera detection are not reliable enough to function throughout the year due to the weather conditions, which can be quite extreme (hot summers, long cold winters with snow and the use of studded tyres). Nevertheless there are substantial benefits to be achieved by installing adaptive traffic control systems with detection units. Based on these experiences the reliability under the divers climate conditions is an important aspect in the procurement procedure. Setting up an international tender procedure by a specialized consultant is advisable. More information about detection systems is included in the factsheets in appendix I.

setting the basis for a traffic monitoring system (RD18)
Latvian State Roads has started in 2005 with the Traffic Information Centre which provides information of road conditions throughout the country. RCC has a Traffic management centre as well at which some key intersections in Riga are observed and if necessary some changes in green times or signal plans can be made. A budget for expanding the network of sensors and vehicle counting/classifying units is part of the RPMP, so the traffic information can be provided at a more detailed level. From this budget additional sensors towards adaptive control detection are funded to complete the sensor network and also the central data processing and analyzing system will be paid. A more dense network of sensors will provide more detailed information to traffic managers and will help to improve model studies for future road projects with better day to day vehicle information. This data also has a value for private companies' initiatives to provide traffic information to their smart phone users. See the corresponding factsheet for more information.

5.2. Parking policy

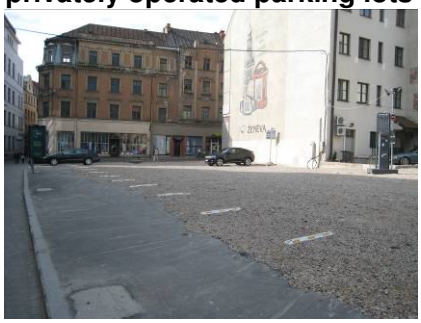
Parking policy is supportive to the street network and can be a powerful instrument to reduce traffic flows by influencing modality choices of travellers. In the planning horizon of the RPMP a growth of car ownership is foreseen in 2025 of nearly 60 % compared to 2007. This will increase the demand for parking places in Riga and Pieriga as well. Without a proper parking policy, this will most probably lead to parking problems in the future and/or an uncontrolled growth of private initiatives to open parking lots at several locations.

In general, parking policy is a task of the local municipalities. They need to act as regulating authority not only for existing city centres, but also for developments in e.g. city boundaries as well as at rural areas. The main reason for this is that the local municipality is held responsible by the public for providing enough parking places, but also to ensure an uninterrupted traffic flow. Given the knowledge that a short term parking place at a city centre (or shopping mall etc.) can generate up to 6-10 passenger car trips per day, it becomes clear the location of parking places interacts with the traffic flow and traffic volume at streets leading towards the parking place. Therefore parking policy is not only dealing with providing enough parking places, but also supporting the proposed use of the street network and the usage of public transport.

municipality of Riga
Today's situation in Riga is a combination of on-street paid parking in the city centre and off-street parking lots or garages which are mostly privately owned. With the rapid increase of car ownership and us-

age, this has led to a rapid growth of private initiatives to develop parking lots since there is a market for providing parking places (see example pictures below). Although this has most certainly been a good short term solution for the municipality of Riga, the downside is an uncontrolled and fragmented network of parking places all over the city and extra traffic at e.g. the old town due to 'temporary' parking lots which have been opened there.

figure 5.1. Example pictures of privately operated parking lots in Riga




In order to cope with future demands for parking places there is need to control the development of parking lots in the city centre so that a further fragmentation will be stopped. On-street parking needs to be restricted. New developments should be served as much as possible with off-street parking places. Therefore the main objective for the parking policy in Riga is:

'To provide a well balanced (paid) parking supply for visitors, inhabitants and workers by means of shifting from on-street parking places to off-street parking places in parking garages, extra parking places should be located outside the city centre by means of e.g. Park and Ride'.

Increase of parking places in the city centre should be limited or better avoided. Apart from the policy concerning development of public parking places, a dialogue with relevant employers has to be started to persuade employers to implement mobility management measures such as:

- providing parking places at their own property for car-poolers;
- sponsored Park and Ride tickets;
- (financial) promotion of the use of public transport.

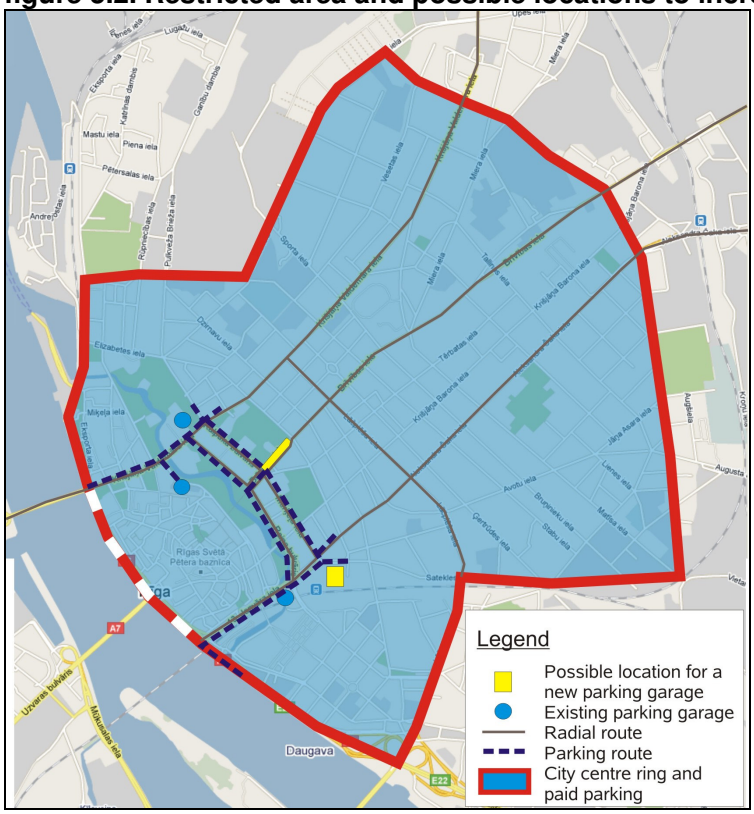
Another way to provide sufficient parking facilities is by opening private parking space for the public at office buildings in the evening and/or weekends when the offices are closed. In Western Europe there are examples around stadiums or concert halls where surrounding closed private parking lots are opened for the public for paid parking during concerts or sport matches.

In order to achieve the main objective, paid parking in the city centre as it exists at present day needs to be expanded to the city centre ring as well. A trigger for installing paid parking or raising tariffs is an average occupancy rate of 85 % at working days. Bandwidths in parking tariffs following the on-street tariff will be set for commercial parking operators to prevent from undermining the parking policy for a specific location or area. In the city centre the increase of parking places has to be restricted to parking places at new developments and municipal approved or initiated construction of new parking lots/garages. Possible locations for the increase of parking places might be:

- parking garage at the Brivibas iela located near the Russian orthodox cathedral using the space made available by installing one way traffic at the Brivibas iela. This parking garage can be used to remove on-street parking at the Merkela iela, Kalpaka bulvaris and the Raina bulvaris and to add extra parking spaces. An estimated 250 places per layer can be built here;
- parking garage in combination with new developments next to the central station. An estimated 200 places per underground layer can be built here.

The restricted area, existing and possible locations for new parking garages together with a parking route for signposting are indicated on the map in figure 5.2.

figure 5.2. Restricted area and possible locations to increase the amount of parking places



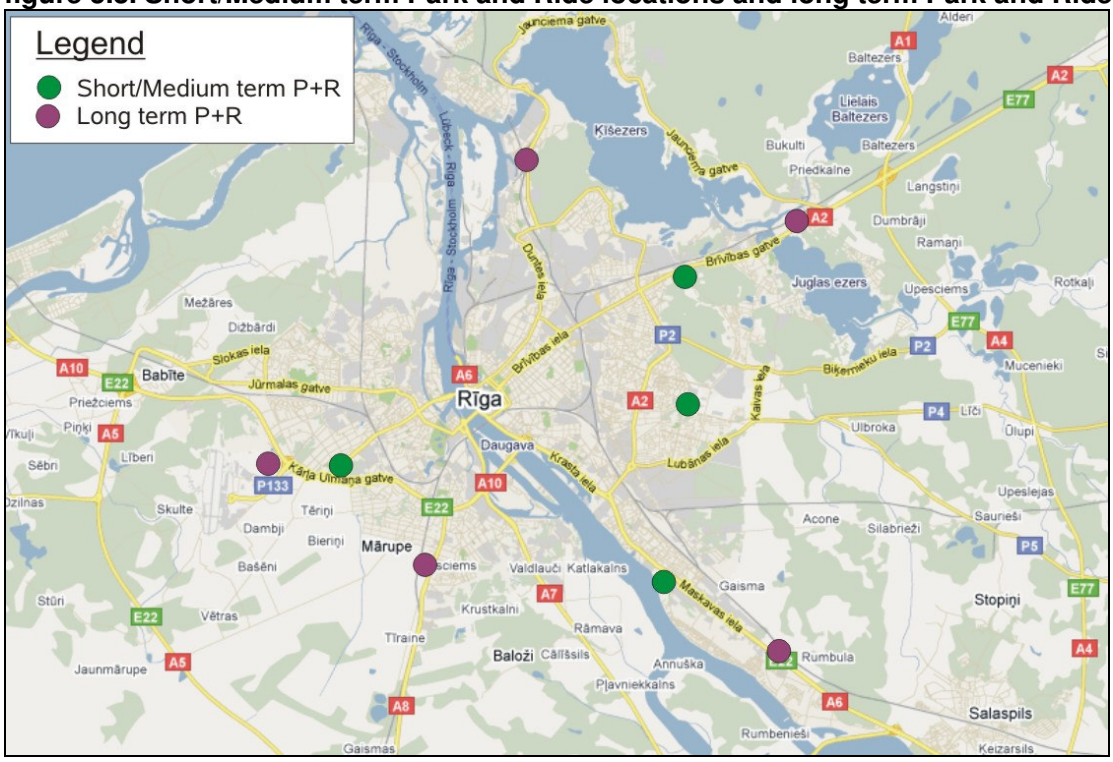
The main increase of parking places is foreseen by creating a total of four Park and Ride locations with in total 1,750 - 2,000 parking places as a start:

- Alfa (500 parking places): near the terminal Smerlis (trolleybus lines) and a tramway stop of the new tramline Jugla – Central Station (future extension to the Airport);
- Dole (near Rasa's iela): (500 parking places) at small extension of tramline 7;
- Dreilini (250 parking places, extendable until 500): near Saharova iela;
- Spice (500 parking places): after realisation of the new tramline to Riga Airport, on the longer term a larger P+R can be built near the planned Exhibition Centre that will be realised in cooperation with the Frankfurter Messe;

After proven to be successful, the Park and Ride locations can be expanded in the longer term at e.g. Rumbula (south-east), Brivibas gatve near Jugla (east), Mangali train station (north) and Sosciems (south-west). In figure 5.3 the Park and Ride locations are visualised.

The main target groups for Park and Ride are workers and visitors/tourists from outside Riga travelling by car. Since the P+R locations are situated within free parking zones, the best option is to provide free parking at the P+R location. Specific public transport ticket fees for daily workers and a special arrangement for visitors/tourists coming with more than one person in a car should be developed to make the P+R attractive for the public. This strategy should be further developed in the first project implementation period. RCC should take the lead since it is part of the municipal strategy to control traffic flows in the city.

figure 5.3. Short/Medium term Park and Ride locations and long term Park and Ride locations



new developments

For new developments, the RCC binding regulations No. 5 (Grozijumi Rigas domes 2005.gada 20.decembra saistosajos noteikumos Nr.34 'Rigas teritorijas izmantosanas un apbuves noteikumi' dated 18.08.2009 are applicable. In chapter 2 section 16 parking requirements for different types of buildings are stated. In principle this means that new developments have to create enough parking places on their own premises for facilitating the expected need for parking places. Exceptions can be made at city centres and locations which are well reachable by public transport, which will lower the car usage. In the first project implementation period these requirements need to be updated in respect to the expected growth of car ownership. In this update there has to be made a distinction in old town, city centre area, suburbs and rural area. Car usage to reach these destinations will be depending on the availability of public transport. Therefore new developments in the city centre area should be allowed to create less parking spaces than similar developments in a suburb where availability of public transport is worse, so there will be more car usage.

In order to ensure a good functioning street network, it is necessary to let analyse the impact of a new development or a (private initiative to develop a) parking lot or parking garage on the existing street network before providing a building permit. For new or amended spatial plans it is recommended to assign certain plots for possible future development of parking lots. For building plots it should be allowed only to create the amount of parking places corresponding to the planned development. To create a new parking lot at a building plot, this will demand for a change of the spatial plan which allows both government and society to give their opinion of such a development.

Pieriga municipalities

Also in Pieriga, parking policy is a local responsibility and should include requirements for creating the appropriate amount of parking places in their building regulations, if this is not already the case at present day. For Pieriga municipalities the trigger of occupancy rates of 85 % or higher to expand the amount of parking places, and start implementing paid parking or raising of parking tariffs should be applied as well.

In this plan the creation of so called origin Park and Ride locations at many train stations in Pieriga is included (see section 4.5 and factsheet 13 for implementation design issues and implementation strategy).

5.3. Road pricing

From a network perspective, a road pricing scheme is feasible (road pricing in this context can be either on streets and/or roads). The RPMP contains a package with public transport measures, including P+R facilities and improvement of infrastructure for transit traffic. This package gives car drivers a better alternative, but is not available at this moment. If a road pricing scheme is combined with new infrastructure for cars and trucks, it is more accepted than as a solo measure.

It is a possibility to implement road pricing or toll on the central bridges to push traffic to the outer crossings (NTC and Southern bridge) and the ring. This system can be combined or replaced with area licensing or electronic cordon based pricing, with which the cordon could lie on the inside of the city centre ring. A combination will avoid internal car traffic using the freed capacity. Moreover, it can be combined with the parking system. The cordon based pricing can be seen as an electronic charge for parking. If a car driver decides to park at a municipal parking space, the cordon charge will be reduced from the parking fare. Hence, car drivers who park in the city centre at public space do not pay anything extra. Transit traffic, on the other hand, does not get parking charges reimbursed, and therefore pays for passing through the city centre. The same might apply to car drivers parking at private parking lots. Exemptions are necessary for dwellers, companies, subscription holders parking garages and possibly distribution traffic.

Further traffic calming and environmental benefits can be established by introducing a distance or time based pricing, so that drivers tend to drive along the city ring as long as possible before entering the pricing area. This would prevent car traffic within the area on both river banks. On the other hand, it might lead to extra car kilometres, and less reduction of car traffic directed to the centre. In the case of time based pricing the parking system needs to be restructured. The fare will be minimal for ultra short parking and maximal for long stay parking and will be collected electronically, instead of via parking meters. For both distance and time based pricing, a more complicated system needs to be set up, so these options are not considered feasible. Also, facility pricing or tolling the NTC route is not considered to be a good option, since it will divert traffic to centre routes and bridges. Tolling is also not very popular anymore by banks and private investors in infrastructural measures as part of the method of financing, due to the high risks involved in the demand analysis and actual usage of the infrastructure after completion.

The conclusion is that a road pricing scheme could reinforce the street and road hierarchy and raise funds for public transport and infrastructure at the same time. According to the transport planning policies defined in the Spatial Plan of Riga 2006 – 2018 there is an idea that an option for introduction of some kind of road pricing in Riga should be investigated. This idea relates both to an efficient traffic flow management measure, improved air quality, increase of the city centre's attractiveness and generation of extra financial resources (e.g. an infrastructure development fund) for financing several infrastructural measures. Since the alternatives for car users in both upgrading public transport and provision of alternative routes with enough capacity are not ready at a short notice, introduction of a congestion pricing (or similar) scheme is questionable. The effects on economical development/restoration of Riga and Pieriga and impact on the existing public transport and road network need to be studied before a decision how and when to implement road pricing can be made. In the action program this study is included for the first implementation period (RD15l).

5.4. Mobility management

After a difficult start, mobility management has proven to be an approach to reduce car traffic as a whole and/or in peak periods substantially. The approach refers to a package of measures to stimulate

employees to refrain themselves from using a car (in peak hours) for their commuting and business trips. For employers mobility management can actually be made profitable. By stimulating more reliable modes than the car, employees are at work in time and suffer from less stress in traffic. Employees coming by bike are supposed to stay healthier, as scientifically evidence suggests, saving insurance costs for employers. Also, employers might save on costs for parking space. If many companies in a certain area join their forces, the accessibility of their location might improve. This is a promising approach in certain corridors and at industrial estates (as part of park management). Finally, employers might want to deploy a mobility management program out of social awareness.

Stakeholders involved in the RPMP can pursue several activities related to mobility management, like:

- motivate their own employees to use greener modes or to go carpooling, by providing a guarded bicycle park facility, conditional travel allowances, conditional reimbursements for business trips, restricted parking for car-poolers and employees from far away, a carpool match program, van-pooling etcetera;
- recruiting personnel from the vicinity and stimulate employees to come to live in the vicinity of the work location;
- stimulating working from home and making appointments for meetings outside the peak periods;
- motivate other companies and institutions like the airport, hospitals, universities to start developing a mobility management program, and for instance signing covenants on agreed commitments, by convincing them that they are problem holders as well.

Outside the scope of mobility management, but in the field of sustainable transport, stakeholders can stimulate using local food in canteens, local and sustainable products, setting requirements in project tenders documents, setting regulations concerning vehicle emissions, installing environmental zone and alike. Two specific approaches are worth mentioning. The first one was called ABC-policy in the Netherlands, with which new employers in the area were directed to locations where the accessibility profile of the location matched with the mobility profile of the company. According to this policy, companies attracting a lot of car or freight traffic should be located in the vicinity of main streets (locations C), whereas companies with service employment and/or a counter function for the public should be located next to main public transport hubs (locations A). The second approach is called designing ‘the other way around’, which means that the development of a master plan for a specific spatial development should start with the accessibility for non-motorised transport and end with infrastructure for the car. This idea is related to the concept of ‘cycle-inclusive planning’.

5.5. PT marketing and promotion

This section presents the PT marketing strategy for the RPMP. Measures are further described in appendix VIII.

why marketing for public transport?

The current situation in Riga and Pieriga is that the market share of public transport as a whole is decreasing. The number of cars is expected to increase by approximately 60 % till 2025. People who buy these cars will also use them for the majority of their trips. Without measures this will lead to more congestion for both the private cars as well as for PT. This causes an increase of travel times for public transport and makes public transport less reliable, thus leading to lower attractiveness for passengers. This will even result in a larger decrease of passenger volumes than caused by an increase in private car ownership itself.

Explicit marketing for public transport can help changing this trend. Marketing in this way must be a lot more than just travel information and communication. It is about knowing what people want and then converting this knowledge into an attractive product/transport system. In the right form marketing can help to encourage car-owners to keep using public transport for certain trips and encourage existing customers to keep using public transport instead of buying a car.

An important part of marketing is image building. This is an often under-estimated aspect. Some people think public transport is only for poor people who do not own a car. The image can refrain people from using PT, because it is 'not done' to travel by public transport. The image of PT can be influenced by good looking vehicles, fast reliable connections, service friendly staff. Cities like Vienna, Hamburg and Zurich are very successful in creating a positive image. The image should make it possible for car owners to tell that they have used PT instead of their own car without feeling ashamed to tell.

Main targets of marketing in Riga and Pieriga

For Riga and Pieriga the following targets for public transport are defined in a SMART way:

1. keep a 35 % market share of transport movements in Riga;
2. keep a 50 % market share on city-centre related trips within Riga;
3. arrive to a market share of 50 % on all trips from Pieriga to Riga city-centre in 2025 (public transport and combination of car and use of Park and Ride).

These targets can only be achieved with a strong focus on the attractiveness of the public transport system for car owners, especially on connections with the city centre.

SWOT-analysis

A SWOT-analysis has been used to outline the Strengths, Weaknesses, Opportunities and Threats of public transport in Riga and Pieriga, related to the perception of travellers. This SWOT analysis gives tools to measures and improvements. Table 5.1 presents the SWOT-analysis.

table 5.1. SWOT analysis of public transport in Riga and Pieriga

strong aspects:	weak aspects (bottle-necks):
1. the public transport network is very dense (but less in Pieriga); 2. there are many direct connections; 3. public transport is rather cheap; 4. travel times are competitive with other traffic; 5. the frequencies of trolleybuses and trams are high; 6. rolling stock of the trolleybus and bus network is relatively new; 7. e-ticketing is easy-travelling; 8. the public transport company of Riga has a good accessible website.	1. it's hard to get (detailed) travel information (e.g. for tourists); 2. travel information on the vehicles is often not present or unclear; 3. the dense network makes it difficult to find the best connection; 4. the tram network is old and does not meet current needs; 5. the image of the public transport system could be better; 6. the network is a collection of isolated lines without sufficient interconnection; 7. limited integration of train/tram/bus fares.
opportunities	**threats**
1. Riga is a busy city with traffic jams every morning; 2. Riga is mono-centric and the city centre is an area to be proud of; 3. road traffic unsafety is a problem, caused by for instance drunken drivers of passenger cars; 4. public transport contributes to reduction of air pollution, CO2 emission and other environmental problems; 5. the dense network makes it possible to travel everywhere; 6. positive political attitude towards PT.	1. increase of car ownership of about 345 cars/1000 inhabitants towards 565 cars /1000 inhabitants in Riga and Pieriga; 2. the car is more than just a transportation mode: it is also a status-symbol of individual development; 3. the financial situation of the government is growing weak; 4. the quality of the PT system is declining, because of more congestion in Riga.

target groups
Marketing in public transport should be a part of the core business of the public transport company. It should initiate a marketing program, in order to achieve the determined goals. However, cooperation with other parties is necessary, depending on the target groups. And that should be the first step: defining the target groups. Possible target groups are given in the table 5.2.

table 5.2. Target groups

target group	partner in marketing for the PT operator
current passengers of Riga city public transport (Keep what you've got)	- transport department city of Riga; - big companies;
commuter passengers (living in Pieriga, working in Riga)	- passenger train company; - transport department city of Riga; - urban communities;
young people (don't drink and drive) in Riga and Pieriga	- passenger train company; - transport department city of Riga; - urban communities; - social networks, schools, Youth organizations;
leisure and shopping	- shopping Malls; - hotels, restaurants; - festival organisations;
foreign people visiting Riga (business, tourists), travelling in Riga by public transport	- Riga airport; - Riga cruise ship terminal; - Riga tourist information (also a representative of hotels etc); - musea and other attractions;

the effect of marketing
The marketing measures for Riga and Pieriga are described in appendix VIII. In general, in relation to the costs and benefits of marketing measures, it is important to keep a few things in mind:
- it is easier to lose what you have then to win what you do not have;
- marketing does always work;
- for making benefits, you first have to make costs.

With that in mind, it is difficult to translate the efforts in marketing into benefits. According to the suggested measures, and assuming that the ticket price is stable, the proposed marketing measures should increase the amount of passengers by 3 - 5 %.

Assuming a realistic increase of the patronage by 3 %, the passenger revenues for Rigas Satiksme would increase to MEUR 72 a year, supposing (realistic assumption) that the growth of passengers can be handled by the current capacity (which means that no extra trams or (trolley)buses are needed), so the rate of cost-effectiveness will rise. This means that for annual investments for marketing an amount of MEUR 2.1 can be assigned (at break-even).

A passenger growth of 3 % can roughly be divided into:
- 1 % new passengers (passengers who did not travel before);
- 1 % former car users;
- 1 % existing passenger who will travel more.

In Riga, the total distance travelled by all public transport passengers (in both Riga and Pieriga) is about 1.3 billion kilometres per year. The average travel distance per passenger in Riga is about 4.3 kilometers (tram, trolleybus and bus). According to a 3 % increase, this means that the annual passenger kilometres will rise by approximately 32 million. Assuming that 1 % of the passenger growth con-

sists of former car users, the annual car kilometres in Riga could decrease by 11 million kilometres, under the circumstances that the travel speed of public transport is at least constant.

Concluding, marketing in order to attract more passengers needs investments, but will lead to an increase in the number of passenger kilometres. However, it is necessary that a certain basic quality in public transport (travel speed) can be provided. Regarding the fact that traffic in Riga and Pieriga in general will increase, this means that this quality only can be realized by investments in public transport infrastructure.

organizational aspects
Marketing measures must be tuned well with the way the PT is organised. The new marketing policies should be closely linked to decisions from the PTA about reforming the tariff system, ticket integration, reforming the network, improving the quality of rolling stock etcetera. The role of the PT companies and the PTA in this process should be clear in order to let the right party act.

The PTA can subscribe an action plan to the transport operators such as Riga Satiksme en Pasazieru vilciens when making new transport contracts with them. Appointments about goals to be reached, investments in marketing measures and monitoring of the results must be part of the transport contracts between the PTA and the transport operator. Also the PTA can take a role in marketing the public transport, for instance on improving the image of the public transport system.

5.6. Commerce at transit centres
A transfer point for public transport (PT interchange, station or a major stop) is more attractive when there are multiple facilities situated. It should be remembered that the primary target group: the commuter, is in a rush at the moment he or she is at the transfer point. The special interest of the commuter (but in fact this counts for all travellers) is to have a fast transfer to the connecting public transport.

This means that commercial opportunities for commuter facilities targeted at a node are rather limited. A kiosk, a ticket booth, small snacks and drinks: these can be combined at the main train, tram and bus stops. Further facilities such as shops are not recommended.

A different situation exists if a public transport stop or node is located in the immediate vicinity of a shopping centre. In that case more interaction may occur and this strengthens the functions. Thus, the shopping centre becomes not only a transfer point between modes, but partly also a destination rather than a place where a traveller is staying waiting for a train, a tram or a (trolley)bus.

Dutch research shows that commuters do appreciate facilities related to public transport (comfortable shelter, ticket booth, seats and toilet) more than facilities focusing on a stay. It can be concluded that a PT transfer point rarely has potential for the development of large-scale commerce, but that small facilities may increase a comfortable stay on the transfer point. Keep it simple, combine the facilities and bundle management and operation of these facilities.

5.7. Passenger Information Systems
For current and future users of public transport in Riga and Pieriga it is important to improve the quality of travel information. In the section on PT marketing already several measures relating to passenger information have been identified, however also at PT stops and in vehicles dynamic passenger information can be used.

Besides a higher frequency, higher speed and less travel time, at least as important is the improvement of the reliability and punctuality of PT. Bus and tram must be on time, and if not, the traveller needs to be informed. A dynamic passenger information system can be used to support other measures in order to improve the quality of public transport in Riga and Pieriga.

Actual and accurate travel information on the (major) stops and in the vehicles contributes significantly to the feeling of reliability of the public transport. Travellers who need to wait are dissatisfied. However, travellers who are informed about the waiting period (and the reason why the system is not running on time) will perceive it as less dissatisfying.

Research shows that if a traveller does not know his waiting time at a tram or bus stop, the waiting time feels as three times longer than it actually is. And travellers do accept calamities or disruption of the public transport service easier when they are adequately informed about causes, consequences and alternative travel options.

Although a dynamic traveller information system is primarily important to inform the travellers, the public transport company and even the PTA can use it as well in order to improve cost efficiency. Improving the cost efficiency in public transport is an important objective of PTA's and transport companies. A higher speed of the trams and (trolley)buses ensures that PT companies can reduce costs or level up their service without raising the costs. The information that a dynamic passenger information system can provide can be used to optimize the deployment of vehicles.

In summary, implementation of dynamic information systems in Riga and Pieriga is an important tool in improving reliability and punctuality, image and cost reducing in public transport. It benefits the quality of the public transport system directly. The development of such a system is therefore included in the RPMP.

6. MANAGEMENT OF PUBLIC TRANSPORT AND TRAFFIC INFRASTRUCTURE

This chapter presents concepts and concrete legal amendments to improve the organisational framework of:
- the public transport organisation;
- the planning procedures;
- the road network.

These proposed changes in the institutional framework are meant to solve the current bottlenecks that have been indicated by the stakeholders during the process of the development of the RPMP and that have been described in the first Interim report. For each topic a summary is presented regarding the current bottlenecks, the proposed organisation and the amendments in the current legislation that are needed.

6.1. Management of Public Transport

The problem analysis has identified the following main items to be improved in the PT organisation:
- enforcing the coordination of regional public transport in Pieriga, including heavy rail, to avoid parallel lines or competition between transport modes;
- decreasing competition of private minibus operators to Riga Satiksme in Riga;
- improving financial commitments of neighbouring municipalities to finance the public transport services of Rigas Satiksme;
- optimising the PT framework (financial aspects, route network, etc as in 2011 the PSO contract with Rigas Satiksme and the licenses with minibus operators will terminate).

ideal situation

Optimisation of public transport can be based on the following institutional aspects[11], namely:
1. information integration (common maps, leaflets, perceived as one, within and outside PT);
2. tariff and ticket integration (points of sale, types of tickets, fares);
3. network integration (planning, co-ordination of routes and interchanges);
4. wider integration (with other modes of transport and with other policies).

Integration of PT can be defined as: the organisational process through which elements of the passenger transport system (lines network and infrastructure, tariffs and ticketing, information and marketing, etc) are, across modes and operators, brought into closer and more efficient interaction, resulting in an overall positive enhancement to the overall state and quality of the services linked to the individual travel components. The integration aspects can be described as follows:

integrated information on routes (such as common maps, etc.), timetables and fares (common leaflets): Information integration means that the system is perceived as 'one', with a unified set of concepts and a common language in the communication towards the users. This includes a uniform image for the network, exemplified by a uniform livery of the vehicles, perhaps a logo and a common marketing for all participating PT companies. Information integration has as its main objective to inform the passengers about the possibilities of travel offered by the system as a whole, both within and outside the PT system, but the availability and content of information has to vary (at home, at stops and in vehicles). Integrated information is meant to lower the barriers to utilisation.

integrated ticketing (total or partial, such as limited to seasonal passes), availability of tickets (points of sales) and integrated fares (partial or integral): The two distinct issues of tariff and ticket integration are often seen as almost synonymous to the concept of integration itself, yet they represent, in fact, only a minor part of the total integration concept. Ticketing integration and fare integration are meant to facilitate travelling from the perspective of the traveller and to remove what is perceived to be anomalous

[11] See: integration and regulatory structures in PT – NEA a.o. 2003

obstacles, such as a price difference between similar journeys provided by a single or by multiple operators (e.g. in a two-legged journey, some users have to pay twice the base fare besides the distance charge when each leg is operated by a different operator, while the base charge would have to be paid only once when both legs are provided by the same operator).

network integration, both at the planning stages and at the operational stage (such as guaranteed interchanges), but also in terms of the co-ordination of infrastructures and main interchanges at the investment stage: PT integration is generally seen as a means to enhance the quality of existing PT services; the idea being that the attractiveness of each service will increase when appropriately embedded into an integral network of services. Network integration is then often interpreted as the creation of a structure where each PT mode fulfils a specific role within the system, making use of its relative advantages. A related keyword is 'coordination' as network integration also relates to the links between long-distance PT networks and local PT networks (including specialised PT services). According to this principle, the various modes of transport have to be used in accordance with their relative advantages by 'bundling' streams of passengers to higher-ranking service modes (trams, metros, heavy-rail). This plays a fundamental role at the investment stage when fixed infrastructures (including main interchanges) are planned. It also plays an important role at the service planning stage (which is, essentially, route and timetable design), by ensuring that services provide attractive 'connections' to each other, both in terms of transfer time and transfer conditions (atmosphere at the interchange areas). At the operational stage it means that foreseen or unforeseen excess demand or service disruptions are taken into account by providing guaranteed interchanges, adequate information and/or remedial services (such as taxis) in cases of delays and alternative services in case of service failures (such as buses replacing trains).

wider integration: This pertains to two main issues. First the integration with the wider transport system (essentially the private car, taxis and bicycles) at the investment, service planning and operational stage, and integration with other non-transport services. Secondly, it means integration with urban planning and with environmental and social policies including health, social services and schools.

In the last section of this chapter the Stockholm County Public Transport Authority has been described as an example for a well functioning PTA. For Riga and Pieriga this would mean that Riga Satiksme, minibuses, regional buses and trains integrate the tickets, network and information, to optimise the services of each PT mode. This would lead to a more competitive PT system.

Cooperation is most likely if PT is organised within one Public Transport Authority (PTA): the organisation contracting the operators. All major western, northern and central European cities have such a PTA (e.g. in Germany: Verkehrsverbund). Moreover the Regulation (EC) No 1370/2007 'on public passenger transport services by rail and by road' does support such an organisational structure (see appendix X). The municipalities keep their influence on their local public transport as they are supervising the activities of the PTA in their region.

A PTA is a governmental organisation which develops and controls public transport:
- the PTA concentrates decision making power about PT;
- the PTA has an intermediate position between the (municipal/regional/national) government and the PT market;
- the government or municipalities delegate tasks to the PTA by legal regulations.

More information on PTAs is included in appendix XI.

potential PTA's for Riga and Pieriga

Within the Latvian context several alternatives were compared to analyse which existing organisation could function as the PTA for Riga and Pieriga and on what administrative level this organisation should

act. Table 6.1 provides an overview of this analysis. Establishing of a new organisation is not considered because of the extra costs, legal amendments, etc.

table 6.1. Alternatives for integrating PT services

level	organisation	positive aspects	negative aspects
National	Road Transport Administration (RTA)	- RTA is currently involved in interregional PT and trains - publishing tenders and dividing funds - interregional PT well serviced as the RTA is responsible for the whole country	- national basis - illogical to transfer funds from municipality to RTA - No power, apart from coordinating - no best practices found in EU countries
Regional	Riga Planning Region	- borders are more or less in conformity with the Planning Region borders - other regions have already this PTA function - acceptable for all municipalities - established for organising among others PT - planning and PT are integrated - many best practices found in EU countries	organisation does not have legal power and should be enforced
local	Riga City Council, Transport Department	Transport Department has already PT knowledge	- limitation to city borders, not to regional borders - not acceptable for other municipalities - no best practices found in EU countries
operator	Merging Riga Satiksme & Pasazieru vilciens	Easy solution. No institutions have to change tasks	- creating an organisation which is difficult to control, not to benchmark on cost level - all PT functions and know-how within operator; strategic, tactical and operational level not separated - how to contract for local, regional and national PT? - who is responsible for service level, quality? - interregional trains do not fit in this model

The overview shows that Riga Planning Region may be best positioned to become the PTA for Riga and Pieriga compared to the other existing organisations in Latvia. Riga Planning Region covers both Riga and Pieriga and represents all municipalities in the region. The Road Transport Department in the MoT is one level too high, as it represents the whole country; the city of Riga is one level too low, as it represents only the city and not the surrounding municipalities. However other options are also feasible,

as long as the PTA can operate independently. It is recommended to study more in detail the position of the PTA in Latvia.

In the following text the consultant draws the possibility of integrating the PTA in Riga Planning Region.

effect of establishing a PTA in relation to the defined bottlenecks
This PTA can tackle all the suboptimal aspects as discussed in the previous section:
- can optimise the services (e.g.: parallel routes are avoided as the PTA organises all routes);
- can avoid unfair competition between PT modes as it can introduce the e-ticketing system for all PT modes for the whole region as an obligation for winning a PSO contract or licenses;
- can force all the municipalities in the region to finance the PT in their municipality;
- can use the momentum of 2011 when the PSO contract of Riga Satiksme and the minibus licenses terminate, for optimising the PSO contracts (especially on integration of the network and the services).

Establishing a PTA has the following advantages: (from the perspective of the passengers, the tax payers and the operators)
- the passengers are gaining travel time (having the right to select the quickest services, like using different PT modes), money (not buying different tickets) and quality (the services are integrated);
- the government will save on subsidies as ticket revenues rise, parallel routes are cut and cherry picking of minibuses is reduced;
- all PT operators together will carry more passengers as the 'PT product' is more attractive to use for the passengers;
- legal clarity as all regional authorities have an equal position in Latvia.

financial benefits of establishing a PTA
Introduction of a PTA for all PT in Riga and Pieriga has several advantages with regard to improvement of the organisation of PT. These advantages can be quantified in financial terms, based on experiences in other countries. Of course estimation of these financial advantages is rather arbitrary, because the situation before introduction of a PTA in the various countries has been different and also the tasks and responsibilities of the PTA may differ. The following advantages can be mentioned:

1. Improvement of division of tasks and responsibilities
   Tasks, responsibilities and decision making will be divided between the different players in the field. This results in separation of operational decisions (with regard to daily operation, by the transport operators), tactical decisions (short and medium term, by the PTA) and strategic decisions (long term policy, by the national, regional and local governments). This means that each of the players has more independency in decision making so that less consultation and deliberation have to be made, which saves on the organisational costs;
2. Improvement of the quality of decision making
   As mentioned above, decisions will be made by the institution that is most involved with the subjects of these decisions and thus has the most expertise on the issues. This will improve the quality of the decisions and will thus reduce possible mistakes, will save costs and will increase revenues and allow better strategy and planning;
3. Improvement of the organisation of public transport
   The PTA is better equipped to implement integration of the organisation and the quality of PT because it controls and monitors all PT modes.

estimation of financial advantages
The advantages mentioned under points 1 to 3 above can be quantified as follows. In the first place a part of the costs of the institutions that are currently responsible for the tasks that have to be concentrated within the PTA can be saved by more efficient work because of larger scale, elimination of dupli-

cations of work and better division of tasks; this can be estimated at approx. 20 % of the current total organisation costs of approx. MEUR 1 = MEUR 0.2.

In the second place the PTA can develop better decision making and can realise the full benefits from improvements of the quality of PT, which also leads to less kilometres of private cars. The total benefits of this extra PT patronage are calculated as an element of the cost-benefit analysis (CBA) and are therefore not calculated here in order to avoid 'double counting'. Apart from improvements of the quality of PT, the impacts of introduction of a PTA on the costs and revenues of PT can be estimated as follows:
- saving on costs of PT: approx. 1 % of approx. MEUR 320 = MEUR 3.2;
- increase of revenues of PT: approx. 0.5 % of MEUR 220 = MEUR 1.1.

This means that the total financial advantage of the points 1 to 3 can be summarised as 0.2 + 3.2 + 1.1 = MEUR 4.5.

overview of effects per stakeholder if the PTA becomes part of Riga Planning Region
authorities:
- Riga Planning Region – includes the PTA of Riga and Pieriga in its organisation;
- Riga City Council – remains to have ownership over Rigas Satiksme; however the organisation of PT and funds will be transferred to the PTA;
- Riga city and other municipalities in Pieriga - supervision of the PTA activities;
- Road Administration – remains to do organisation, contracting and funding of regional buses and trains outside Pieriga, but these tasks for regional buses and trains within Pieriga will be transferred to the PTA.

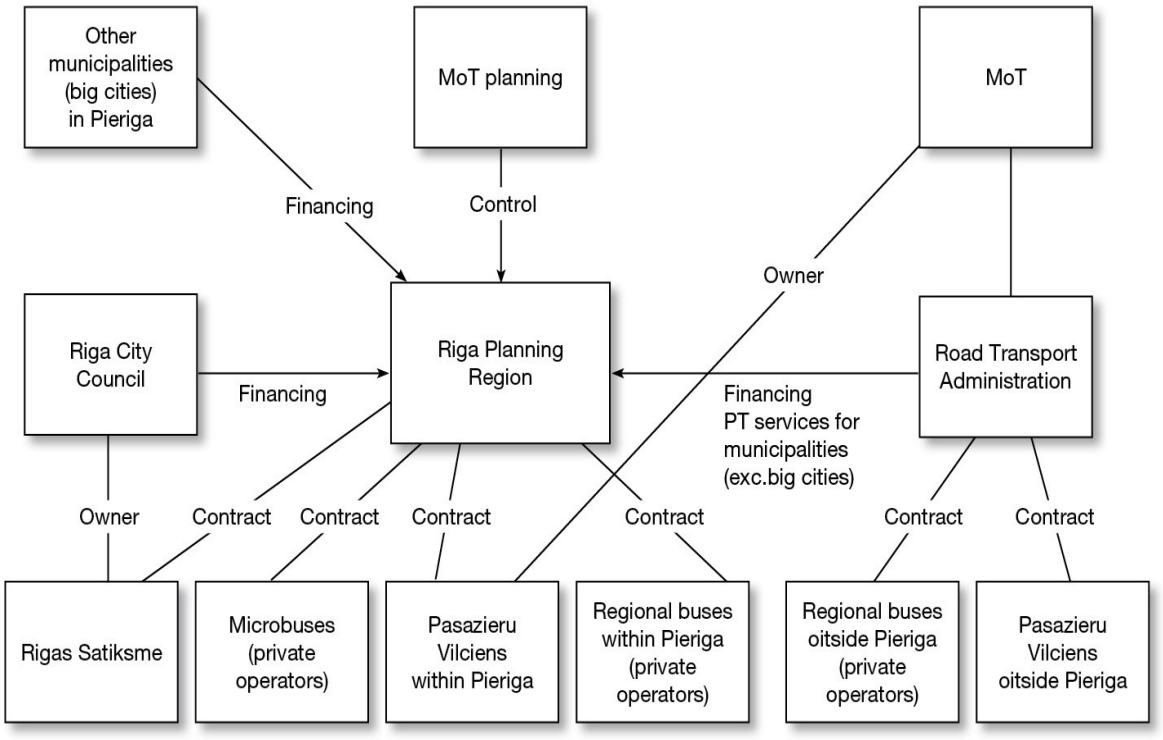
operators:
- Rigas Satiksme, regional buses and minibuses: – the PSO contracts will be concluded by the PTA, ownership does not change;
- regional trains – the PTA will contract Pasazieru vilciens for the regional services.

The organogram in figure 6.1 provides an overview of the organisation of PT in case the PTA is included within the organisation of the Riga Planning Region. As mentioned, there are other options and practical considerations may prevail in making a choice.

proposed tasks for the PTA
The PTA should have the following tasks:
- development of a standard for provision of PT services and drafting of PT usage regulations;
- development of an optimal, demand meeting PT route network;
- integration of the railway transport into the regional PT system;
- licensing and contracting of PT service providers;
- coordination, control and monitoring of PT routes, services and traffic flows in Riga and Pieriga;
- conclusion of agreements on performance of carriages in accordance with legal acts;
- fostering of modernisation and quality level of PT;
- development of effective and economically substantiated PT service payment system.

Currently each of the municipalities has different budgets and priorities; therefore the PT service quality differs from one municipality to the other. The PTA must have the legal capacity to take over the tasks mentioned above from the municipalities. The idea of establishing new regional institutions is based on optimisation of the PT integration, costs, efficiency and quality. Therefore the PTA should be mainly financed from state budget.

figure 6.1. Organogram for proposed PT organisation



interpretation of legislation within the proposed institutional context
To define whether amendments in the law are needed to create the proposed institutional framework, the current legal and institutional framework has been interpreted, keeping in mind the proposed institutional context. An overview of the current legislation for PT services is given in appendix XII.

amendments to create the proposed institutional framework
There are several options for embedding of PTA within the institutional framework of PT. In other countries there is a variety of different choices that have been made, taking into account the division of tasks and responsibilities between the different stakeholders, with regard to policy making, planning, management, control and carrying out of PT.

If the main stakeholders are represented in a supervisory board, embedding of the PTA in an existing organisation is not an important issue and can be based on practical considerations, such as location and facilities of housing and contacts with other stakeholders. In any case, the precondition that the PTA is able to operate independently within the authority that has been delegated to the PTA should not be endangered by the actual embedding of the PTA.

There are a few legal motives for embedding the PTA in Riga Planning Region. According to the Regional Development Law (Part 1 of Article 16) Riga Planning Region is carrying out activities supporting the regional development, and provides coordination and cooperation between municipalities and other State administrative institutions. According to the Public Transport Service Law, from 1 January 2010, Riga Planning Region is also responsible for the route network and for organization of the PT services in their network/region, but still this provision is ineffective, as each of municipalities has obligations to provide PT network and services.

tendering
If the responsibilities will be transferred from the municipalities to the PTA, Rigas Satiksme will have to participate together with other operators in the public tenders for PT services in Riga and Pieriga (organized according to the Public Procurement Law by the PTA) The EU regulation 1370/2007 specifies that contracting the 'in-house' (internal) operator (Rigas Satiksme) directly, without tendering process, is possible as long as the authority exercises control over the 'in-house' operator. This is also possible if the municipality (RCC) transfers its contracting power to the PTA. See appendix X for detailed information on EU 1370/2007.

Based on the analysis in the previous section, the following amendments are necessary.

table 6.2. Amendments to create the proposed institutional framework

Law/regulation	type of amendments
the Public Transport Services Law	the current law should be updated in order to determine the accountability of the PTA. Mostly these are editorial changes, but result in the PTA taking over the functions for organizing PT from the municipalities.
the Regulations of the Cabinet of Ministers No.1226, of October 26, 2009 'Procedure on setting tariff for compensating deficits and expenses incurred by serving public transport services'	according to the changes into the law these rules should be revised.

The complete list of amendments is provided in appendix XIII.

conclusions
Based on the current bottlenecks in public transport a concept for organising PT was developed, taking into account the best practices from the main urban areas in northern and western Europe. The institutional framework foresees in the establishment of a public transport authority, which is organising PT for the whole Riga and Pieriga region and for all PT modes: local PT, minibuses, regional buses and regional trains. Integration of PT will promote the service level and patronage of PT.

The costs analysis showed the financial benefits of integration of PT. The legal impacts of amending the necessary laws and regulations are limited; most probably the political will to change the institutional framework is more important. Moreover, as the PSO contracts for both Riga Satiksme and the minibus operators end in 2011, the new established PTA can integrate PT within new PSO contracts.

6.2. Planning of transport infrastructure

This section evaluates the existing framework for the planning of transport infrastructure and presents proposals for adjustments to improve the planning documents.

bottlenecks in the planning documents
1. currently in Latvia the MoT cannot force municipalities to adopt national transport plans, e.g., a National RPMP. There is no formal relation between the MoT and municipalities; therefore cooperation with the Riga City Council is on a voluntary basis from both sides;
2. in general there is limited cooperation between ministries on project level (only when it is required in the law). This means that when the MoT requests the Cabinet of Ministers for approval - this usually will be the first time that other Ministries will comment on the (Mobility) Plan and check whether it suits with their plans;
3. on national level the main roads in Riga are seen from the perspective of their use as transit roads, whereas municipalities would see the main roads as a part of their network. For the first mentioned

aspect a minimum number of accesses are desirable for improving the speed, whereas for the second aspect many accesses are needed to get cars and trucks on the main road as quickly as possible.

ideal situation
Cooperation in an earlier stage between Ministries should be institutionalised to avoid delay or even changes in plans due to requests of other Ministries. And municipalities should be forced to implement Sector Ministerial Plan into their local plans.

If the national roads within the municipalities are part of the National Road Network and integrated in the Transport Plan the following aspect is tackled; the different road use policies between municipalities and Latvian State Roads (LSR) can be avoided as the LSR on behalf of the MoT, prepares the planning for the national roads within municipalities.

interpreting the draft Law on Spatial Planning
The main planning documents with regard to spatial planning and infrastructure are:
- the National Development Plan 2007-2013 - approved by the Cabinet of Ministers on 4 July 2006 and enforced with the order no 203 of the Cabinet of Ministers on 9 April 2010. The Plan determines Latvia's main development directions and the most important national goals;
- the Sustainable Development Strategy of Latvia up to 2030. An expert group was delegated by the MoR to develop this Strategy, and defined as key principles: happy people in a prosperous country, sustainable and healthy way of life, creative and tolerant society, cooperation-based competitiveness and country as a 'fast ability' partner. After approval in the parliament (Saeima), the strategy will become the main planning document of the country with a legal force.

An overview of the current legislation on spatial planning is given in appendix XIII. Currently, development of planning is governed by three laws:
- the Law on System of Development Planning;
- the Regional Development Law;
- the Law on Local Governments.

In order to avoid that the same issues are regulated in three separate laws, the new Spatial Planning Law has been prepared. This law will delegate to the Cabinet of Ministers the responsibility for:
- conditions for the development, implementation and monitoring of the Spatial Planning Law;
- requirements for the content and design of regional development planning documents;
- provisions for the content, design, financing methods, and requirements for development planning documents of local municipalities;
- general requirements for use and building of spatial planning;
- provisions for the allocation of earmarked grants.

The aim of this new law (Article 2 law on Spatial Planning) is to promote sustainable and balanced development of the country, based on the effective spatial planning system, complying with principles (Article 3) that support continuity and integrated approach.
According to this draft law competent authorities will be:
- the Cabinet of Ministers (Article 7) - competence in relation to above mentioned regulations;
- the MoR as the responsible ministry (Article 8) – develops strategic and spatial planning documents, controls implementation of development;
- the National Development Council (Article 9) - coordinates and examines the implementation of planning documents;
- sectoral ministries (Article 10) – prepare proposals (if necessary) and collaborate with other institutions, provide information or suggest regarding conditions in order to prepare spatial planning documents;

- sectoral ministries (Article 10) – prepare proposals (if necessary) and collaborate with other institutions, provide information or suggest regarding conditions in order to prepare spatial planning documents. It should be defined, that the MoT as a competent ministry in development of transport infrastructure would prepare provisions that the MoR shall implement in spatial planning documents;
- Planning Regions (Article 11) – develop, approve strategic and development programs, coordinate and control their implementation, prepare proposals in planning documents, manage and controls development of local development programs etc;
- Local municipalities (Article 12) are responsible for preparation and implementing of local planning documents, which are in line with all legal requirements.

It should be defined, that the MoT as a competent ministry in development of transport infrastructure would prepare provisions that the MoR shall implement in spatial planning documents.

All development and spatial planning documents should comply with Latvian Sustainable Development Strategy (long-term spatial development planning document that describes national trends) and National Development Plan (medium-term spatial development planning document that sets policies and areas of development priorities, direction of activities and funding sources).

Article 15 (2) states that the National Development Plan is developed by assessing the sectoral policy planning documents and planning of regional development programs.

According to Article 21 (1 & 2), local governments draw up development strategies for 12 years as a minimum, defining goals and priorities for the local long-term development, describing and in graphic form showing the spatial development perspective, which provides a graphical representation of local spatial structure, including the transportation infrastructure.

proposed amendments to the draft Law on Spatial Development
As the MoT is also an important authority in planning of transport infrastructure, documents prepared by the MoT have also to be assessed. Therefore Article 15 (2) should be amended – adding that 'regarding transport infrastructure planning documents the competent authorities in the transport sector should be involved'.

It is planned to enforce this draft law next year (1 January, 2011). The new Law on Territorial Planning provides the Ministries the right to prepare plans – like a National Road Plan. Such a plan should describe in detail how each national road section should look like, also within the municipalities. So far MoT has not prepared such a Road Plan, and it should be obliged to prepare such a plan.

Based on the previous analysis the following amendments are proposed.

table 6.3. Proposal for amendments to the spatial planning laws

the law and draft law	type of amendments
the Regional Development Law	The Riga Planning Region (and other regional authorities) could be an authority that coordinates planning documents regarding transport infrastructure in cooperation with the MoT.
draft Law on Spatial Planning	The new draft of this law does not contradict with the suggested model. It is not necessary to amend this draft, but the role of the MoT as the responsible ministry for transport infrastructure could be specified.

The complete lists of amendments is provided in appendix XIV.

conclusions
The main objective of the MoR is to foster coordination of the development planning process between regions and local governments in all questions related to regional development. The MoT is responsible for: traffic flow, safety and road management and maintenance. However, both ministries have to cooperate in preparation of the transport infrastructure network, namely, the MoT prepares road network plan and/or other infrastructure planning documents, the MoR includes them in the territorial planning documents.

The planning documents could be used to organise that roads are used in the most appropriate way and that this is coordinated at national level. The draft Law on Spatial Planning should be amended to realise the coordination and to enforce the role of the MoT.

6.3. Road maintenance on national roads within cities

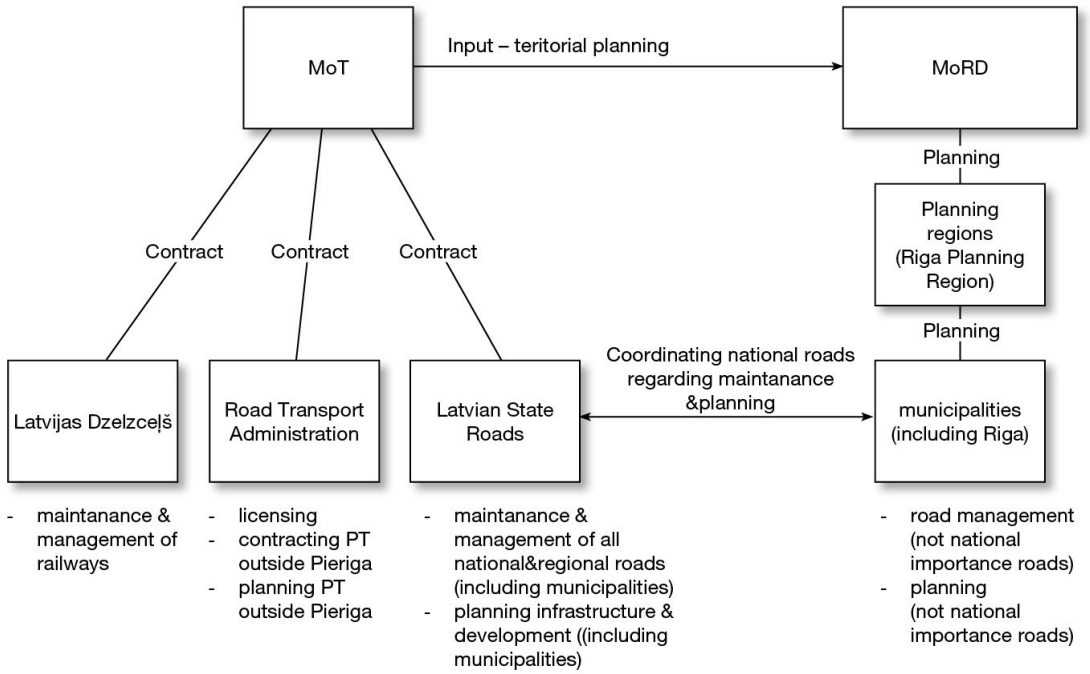
Maintenance of national roads, excluding some sections of national roads within certain municipalities, is planned and organized by Latvian State Roads (LSR). This can lead to differences in maintenance plans - roads which do not have the same standards in the territory outside the municipality (i.e. when passing the Riga city borders) and road infrastructure investments which are not coordinated between LSR and Riga City Council. Municipalities have to apply to the MoT for co-funding for maintenance. The MoT is reviewing applications according to priorities and quality of the roads. Due to financial problems within the municipalities such request for additional state budget does not always have priority.

ideal situation
Integrating those municipal roads which are part of the national roads in the National Road Network under the responsibility of LSR will solve the maintenance bottleneck of national roads within the municipalities. If the national roads within the municipalities are part of the National Road Network under responsibility of LSR then the following aspects are tackled:

- the different maintenance level between municipalities and LSR of national roads will be avoided as LSR prepares the maintenance plans, finances the maintenance from the State budget and organises the maintenance according to one standard;
- the municipalities do not have to reserve budget for maintenance of national roads and can avoid all administration costs because no applications for co-financing of LSR have to be prepared.

The organogram in figure 6.4 provides an overview of the proposed organisation of the road planning and maintenance.

figure 6.4. Proposed organisation for road planning and maintenance



interpreting the current legislation within the proposed institutional context

According to the Road Law (Article 3), roads are classified according to their importance. The state roads are classified in three groups:

- state importance roads - connect with other countries' capitals and main road networks;
- regional roads - connect administrative centres with the capital and with other large cities within the country;
- local roads - connect administrative centres with districts, villages and other inhabited places.

Article 1 of the Road Law states that local authorities are responsible for city streets, their maintenance and use.

According to Article 4 of the Road Law, roads of state importance with all their constituent structures are a property of the State, and LSR is responsible for their maintenance and reconstruction; this also includes sections of state importance roads which are streets within territories of municipalities.
However, there is an exception (Article 4 (11)) to this rule - with a decision of the Cabinet of Ministers the state roads can be transferred to municipalities, making them obligated to maintain and reconstruct roads, applying for financing.

The current situation – not only in some cases, but according to the Regulation of the Cabinet of Ministers no 1104, of September 29, 2009 'The List of the state roads and municipalities-owned road sections in the state road network', most, if not all, sections of state importance roads within the territory of Riga and Pieriga is in ownership of municipalities. Thus, these municipalities are in fact maintaining and reconstructing these sections of state importance roads, with LVS involvement limited to approval of technical regulations for tenders, if case such are organised. Therefore, the quality of maintenance and financial matters for construction differ.

An overview of the current legislation for maintaining the road network is included in appendix XII.

amendments proposed to current legislation to reach ideal situation
Based on the previous analysis the following amendments are proposed.

table 6.5. Proposed amendments for laws on road planning and maintenance

law/regulation	type of amendments
the Road Law	the proposed changes concern the limitation of the municipalities regarding state importance roads. The ideal situation – to have only one authority responsible for the task. Latvian State Roads is already responsible and all of its tasks are related to similar issues, while municipalities have different priorities.
the Regulation of the Cabinet of Ministers no 1104, of September 29, 2009 'The List of the state roads, maintained by municipalities' (in force since October 3, 2009)	the list of such state roads should be revised with respect to the provision of the Road Law, which states that only in some cases (with a special decision of Cabinet of Ministers) parts or sections of state roads within the territory of the municipality can be maintained and contracted by municipalities, i.e. these sections should be considered/transferred in possession of LVS not municipalities.

The complete lists of amendments is provided in appendix XV.

conclusion
Latvian State Roads has been established with the purpose of maintaining and construction of the national roads network. Once LSR is responsible for road maintenance of national roads also within city boundaries, LSR can guarantee a standard maintenance level on these roads. In the ideal situation LSR will take over the management of non-constructed territories in the cities of the main state road sections.

However, it should be taken into account that in most part of the cities in Latvia the main roads are streets with characteristic location of buildings and communications and therefore there will be quite different organisation for the managing (maintenance, renewal and reconstruction) and dominant function of access. Moreover it is difficult to determine equal maintenance standards for the streets and roads, also due to the quite different traffic load and contents.

6.4. Example PTA: Stockholm County

information integration
Within the Stockholm County all customer information is in principle produced and disseminated by the organising and planning authority SL. The operators inform the customers about delays in services. This framework reduces the risk of providing too little information. As SL is the organisation responsible for the planning of public transport, it has all information available immediately, e.g. regarding service network and tariffs. All information, including timetables, are provided free of charge to the users.

The responsibility to inform about delays in services has been given to the operators. The process is managed by a special purpose company in which all operators are represented. Every new operator is obliged to purchase shares of this company. The outcome is essential: a single knowledge provider, one window for the passenger, full control, travel guarantee and specialist knowledge.

Moreover in order to give operators incentives to provide this customer information, quality variables like reliability and passenger satisfaction are usually included in the service contracts between operators and SL. Operators can receive an extra bonus when they score high rates on the respective quality variables.

ticket and fare integration
Tariffs are fully integrated, as it is possible to buy one ticket that includes all modes. Before SL was formed, there were several operators with different tickets. Only some lines had co-operation regarding special transfer tickets. The new tariff system made it possible to buy a ticket at the beginning of the journey and use for transfers during one hour without extra payment, thus guaranteeing that all trips would include only one payment. Seasonal tickets give the right to unlimited travel with PT during the period of validity, usually a month.

network integration
All modes, underground, commuter trains, local train (light-rail), and buses are well integrated. Before integration was introduced in 1967 the different modes of transport were often acting as competitors. For example, certain bus companies offered parallel services along corridors served by trains . Integration caused a redefinition of the bus routes and instead the buses were used as feeder services. In order to shorten waiting times, timetables of feeder buses and local trains were co-ordinated. However, there is a smaller degree of integration of timetables between the underground mode and buses or within the same mode of transport.

wider integration
When considering, the wider integration of the PT system some aspects are not sufficiently integrated. Integration between private transport (car and bicycle) and public transport is low. Planning for Park and Ride facilities and bicycle stands is a municipal task. However, strong incentives for municipalities to provide parking close to PT are lacking. One reason for this might be the division of responsibilities between the County Council and municipalities. Since Stockholm is built on several islands there is potential for widening the PT with boat traffic (bringing the existing boat traffic more closely into the integrated systems, particularly ticketing).

overall assessment
The overall public transport (PT) system in Stockholm County is considered optimally integrated. The factors that contribute to this are integrated planning, inclusion of different modes of transport, and the coverage of a sufficiently large geographical area. Stockholm County has always been a very good proxy of the functional region of Stockholm. Integration between PT operators is achieved by public procurement of pre-defined transport services with broad specifications concerning timetables and capacity planning. Operators do not receive the ticket revenues, which are instead passed to SL. Instead they receive the contracted sum of their offer. Some contracts include quality variables such as cleanness, reliability and passenger satisfaction. High levels of these quality variables mean extra revenues (bonuses) for the operators. SL is currently trying to define reliable quality variables for future contracts. For example, the number of passengers has been removed as a quality variable, as changes in passenger numbers are thought to be more strongly correlated stronger with business cycles than with the efforts of the operator.

Investment plans for Stockholm aim towards a future PT network with the commuter train as the backbone, and more resources for tangential (‘feeder’) connections. PT to Arlanda airport, is part of the future commuter train system. During the past years, the functional mobility area of Stockholm has enlarged into the counties in Stockholm Mälar Region. Co-operation in the field of ticketing in this area began in 1997. Increased co-operation between Stockholm and the other Mälar Region counties is expected in the future.

7. RPMP FINANCIAL PLAN

In chapters 4 and 5 and the accompanying appendices the investments included in the RPMP have been described. This chapter presents the financial plan for the RPMP and discusses available and required fundings sources and budgets.

7.1. Introduction to funding sources

The following funding sources are available for transport infrastructure development in the Riga and Pieriga[12] Mobility Plan:

- grants from the EU structural financial instruments: mainly European Regional Development Fund (ERDF) and Cohesion Fund (CF);
- State budget;
- Riga City Council (RCC) budget;
- loans from international banks (EBRD, EIB, NIB) (discussed in 7.6);
- loans from commercial banks (discussed in 7.6);
- investments from private investors (public/private partnership (PPP)) (discussed in 7.7);
- revenues from the transport system (public transport, parking, road pricing, rail infrastructure charging) (discussed in 7.11);
- sale of property.

The projects defined in the RPMP for Pieriga mainly relate to improvement of public transport, creating of Park and Ride facilities at train stations and improving of traffic safety at main roads. These investments are likely mainly funded from national budgets. The measure to improve traffic safety in Pieriga (5 MEuro) is the only specific municipal funded measure for the RPMP in this area. Because of this limited use of budgets from Pieriga municipalities, in the RPMP these budgets are not included in this chapter.

The Freeport of Riga Authority also invests in the land transport infrastructure within the port boundaries, particularly in rail. Since the rail connection to the port is also part of the Reference scenario, the RPMP does not require additional budget for port development.

'Rigas satiksme' - the public transport company in Riga which is solely owned by Riga City Council - invests particularly in rolling stock and tram rail. This public limited liability company generates revenues mainly from ticket sales, but requires each year a substantial sum from RCC to cover deficits. As such, the company fully relies upon RCC (e.g., a state public transport subsidy provided to RCC) and occasionally upon other public bodies for its investment capacity and budget. A similar situation applies to the state joint stock company 'Pasazieru vilciens' (Passenger train) which fulfils a public service agreement signed with state limited liability company 'Autotransporta direkcija' (Road Transport Administration - RTA). Pasazieru vilciens has to provide public passenger train services on routes and with frequencies and capacity as set forth in the public service agreement. The RTA is liable to compensate operating deficits to Pasazieru vilciens.

7.2. Introduction to funding budgets

EU structural financial instruments

Financing from the CF and ERDF is defined for the current EU funds programming period 2007-2013. The budgets of Measures 3.3 'Development of transport network of European significance and promotion of sustainable transport' (851 MEuro)[13] and 3.2.1 'Development of availability and transport system'

[12] Budgets of other municipalities forming Pieriga territory are not included as budget sources.

[13] Source: Operational programme 3 'Infrastructure and Services' of the National Strategic Reference Framework 2007 -2013 (ERDF and Cohesion Fund). However, on the website http://www.sam.gov.lv/satmin/content/?cat=319 on 27092010 an amount of 841 MEuro is mentioned.

(322 MEuro)[14] for the period 2007-2013 are allocated for investments in main transport infrastructure. Of these measures an estimated 30 % (see also scenario analysis) has been spent/allocated to Riga and Pieriga. This budget represents the main funding budget for investments in new and upgraded transport infrastructure for Riga and Pieriga. In addition to CF and ERDF, EU funds for TEN-T projects may also be used. These are however mainly used for studies. The only TEN-T construction project funded so far (construction of the two level crossing over Viestura prospekts and Meza prospekts) received an EU grant of 3.9 MEuro.

From communications with DG-Region it appears that for the next EU funds programming period 2014-2020 discussions on the planning have just started. Also the contribution of individual EU member states to the EU for this period has not been defined yet. Probably, these budget decisions will only be clear in 2013. At this moment it is therefore too early to present any indications about resources available to the EU member states and to Latvia, certainly after the current worst economic crisis since decades. Even if EU resources for transport will remain at the same level, it is quite possible that environmentally friendly modes will be favoured, which means that there will be less funds for roads/bridges construction and more funds for public transport, traffic management measures and bicycle roads. Although EU officials tend to expect that the EU contribution for transport infrastructure development in Latvia will decrease compared to the current period, still assistance to Latvia will be provided. However, other experts do not expect a marked decrease of the EU contributions.

CF financing is dependent of meeting of conditions regarding the level of GDP per inhabitant, the annual state budget deficit in relation to GDP, balance between transport projects and environmental projects, and meeting of the TEN-T guidelines. ERDF financing is possible for projects supporting sustainable transport and sustainable urban development, regional development, accessibility, and quality of living. It can be concluded that the traffic and transport measures that are proposed in the RPMP generally meet the requirements set by the CF and the ERDF. The EU subsidy can be up to 85 % of the investment amount of a project for the new EU-12 Member States. However the total subsidy amount cannot exceed the amount that has been allocated to the country for transport projects within the 7-years period.

national budgets

The national and municipal budgets depend upon (national, municipal) tax revenues, which are influenced by economic growth. The Latvian economy contracted by - 4,6 % in 2008 and -18 % in 2009. For 2010, the IMF estimates a further decrease of -3.5 % but from 2011 resuming of economic growth is expected. IMF economic growth projections show that the national income will have recovered by 2018 to the 2007 level but other, more optimistic forecasts indicate that this point may be achieved already in 2014.

The total budget allocated for state roads amounted to 180 million LVL in 2008 and has dropped to 70 million LVL in 2010. Besides, LSR have access to the State Treasury loan issued in amount of 20 million LVL in 2010. Although maintenance and repair of state roads are financed from direct dues (fuel excise tax and annual vehicle due), such revenues have been reallocated for pending public spending needs in other sectors of the national economy. As a result LSR has barely funds to provide periodic road maintenance (45 million LVL which is 64 % out of 70 million LVL) and the remaining funds for road repairs are very limited (25 million LVL). If Latvian government continues to pursue such budgetary policy, it is practically impossible for LSR to raise funds for new transport investment projects.

In line with this, it is assumed that the LSR funds for road maintenance and investments will have recovered in 2018 to the highest level so far since 2008. A linear increase over this period is assumed.

[14] Operational programme 3 'Infrastructure and Services' of the National Strategic Reference Framework 2007 -2013 (ERDF and Cohesion Fund).

The LSR budget for new transport investments is restricted to the budget for EU co-funding. Part of the 'capital investments' from the LSR budget concentrate on periodic maintenance, among others for state main roads. It is concluded that this budget cannot be shifted to fund RPMP projects, because road (periodic) maintenance is necessary and can not be neglected.

An assumption is made for the allocation of this state budget financing to Riga and Pieriga. 17 % of the state main roads are located in Riga Region[15]. The allocation and need for investment funds to Riga and Pieriga is however expected to be higher, both because of more intense road use as well as the economic dominance of Riga and Pieriga in Latvia. It is therefore assumed in the projection that 25 % of the state budget spending is allocated to Riga and Pieriga.

Riga City Council
RCC has prepared a projection of total capital expenditure until 2017, presenting among others EU project financing and 'other capital expenditures'. In 2007 and 2008 respectively 29 % and 36 % of the latter category was spent on transport infrastructure; in the projection the ratio between transport and total investment is assumed to be the average of these two percentages (33 %). It is also assumed that 50 % of this budget cannot be shifted to the RPMP because these investments relate to periodic maintenance or other indispensable activities. RCC also presents a forecast on EU project co-financing, part of which is used for transport infrastructure investments. Based on the 2010 budget in which 8.8 million LVL out of 26.9 million LVL (= 33 %) is used for transport, also a ratio of 33 % for transport out of the total investment in the projection is assumed[16]. It is expected that the full amount of this budget can be used for RPMP projects.

7.3. Scenarios for financial sources

Forecasts in general as well as forecasted budgets are by definition uncertain. Therefore four different scenarios are used for the budget forecast. It is expected that the main uncertainty in the projection of budgets relates to EU funds. As a consequence of the objective of the EU governments to reduce their budget deficits, a lower EU Funds budget needs to be considered. Therefore the scenarios used for the period 2014-2020 are assumed to be equal, 33 % lower or 66 % lower compared to the current budget.

The public budgets projection presented is based on historic data, forecasts made by stakeholders (RCC), and economic growth. It is assumed that the availability of these funds is more predictable, and that in the low scenario the Latvian budgets are 10 % lower than calculated from economic growth, and in high scenario 10 % higher. The high+ scenario supposes 50 % allocation of EU funds to Riga and Pieriga instead of 30 %, which is mainly based on the national and regional importance of the NTC. The scenarios are summarized in table 7.1.

table 7.1. Scenario definition for transport investment budget projection

	low	middle	high	high +
EU funds, from 2015 onwards [1)]	- 66 %	- 33 %	0 %	0 %
Latvian funds, from 2011 onwards [2)]	- 10 %	0 %	10 %	10 %
EU funds allocated to Riga and Pieriga	30 %	30 %	30 %	50 %

1) compared to EU financial instruments for the current programming period

2) compared to economic growth based projections

7.4. Budgets for RPMP transport infrastructure

Table 7.2 presents a projection of the five main financing sources for transport infrastructure investments in Riga and Pieriga using the assumptions for the middle scenario. As mentioned before, the state budget for LSR road infra investments are included in the total capital budget, but not in the total

15 Source: Latvian State Roads Yearbook 2008

16 This budget is also corrected for a pre-financing complement of EU projects, which are also included in the RCC figures.

budget available for RPMP because this fund will be used mainly for periodic maintenance and little will be left for investments. It is also assumed that of the RCC budget for transport infrastructure investments only 50 % is available for RPMP projects because RCC will also have to finance some indispensable expenditures. For EU funds it is assumed that they are evenly distributed over the years, which can be argued.

table 7.2. Budgets relevant for RPMP investments, middle scenario (MEuro)

	priority 3.3 and 3.2.1 of national strategic reference framework	LSR Road infra investments	LSR EU co-financed projects	RCC Transport infra investments	RCC EU financing for transport	total capital budget Riga transport	total budget for Riga and Pieriga transport investments
Use for RPMP [1)]	100 %	0 %	100 %	50 %	100 %		
2009	50.3	9.9	25.5	38.9	11.3	135.9	107
2010	50.3	10.5	25.0	61.2	12.4	159.4	118
2011	50.3	11.3	24.6	37.2	9.3	132.8	103
2012	50.3	12.2	25.4	14.1	9.7	111.6	92
2013	50.3	13.1	26.1	40.8	8.9	139.2	106
2014	33.2	14.0	26.8	41.8	7.8	123.6	89
2015	33.2	14.9	27.5	42.9	5.7	124.1	88
2016	33.2	15.7	28.2	44.0	6.7	127.8	90
2017	33.2	16.6	29.0	45.1	7.2	131.1	92
2018	33.2	17.5	29.7	46.3	7.7	134.3	94
2019	33.2	18.4	30.4	47.4	8.2	137.6	96
2020	33.2	19.2	31.1	48.4	8.7	140.7	97
average (2012-2020)	38.9	15.7	28.2	41.2	7.8	131.9	96

1) The part of transport investment budgets for Riga and Pieriga which is expected to finance RPMP projects

Table 7.3 presents the total annual budget for Riga and Pieriga transport investments for the four scenarios.

table 7.3. Total annual budget for the RPMP investments for the four scenarios (MEuro)

Year	scenario			
	low	middle	high	high +
2010	111	118	125	159
2011	98	103	108	142
2012	88	92	97	130
2013	100	106	111	145
2014	67	89	111	145
2015	66	88	110	144
2016	68	90	113	146
2017	69	92	115	148
2018	71	94	117	150
2019	73	96	119	152
2020	74	97	121	154
average (2012-2020)	75	96	113	146

In the low and high scenario the total average budget for Riga and Pieriga transport investments is 75 and 113 MEuro respectively (2012-2020). The total annual budget for the high+ scenario, assuming that

50 % of Latvian funds are allocated to Riga and Pieriga, amounts to 146 MEuro. The presented budgets are assumed to be available for the financing of RPMP investments, as well as for the maintenance costs of these new and upgraded projects. As mentioned earlier, these budgets do not include the 'capital expenditure budget' of the Latvian authorities for road periodic maintenance and other indispensable expenditures.

7.5. RPMP investments and budget requirements

The total investment amount needed for the RPMP is 1,700 MEuro (economic value, excluding taxes and dues), with as the main investment the Northern Transport Corridor. The basic assumption underlying this analysis is that investments in transport infrastructure will be eligible for the next EU funds programming period 2014-2020.

Major infrastructure projects like the NTC, even if phased, can not be funded from the running budget(s) but require the public authorities using loans or entering into a PPP-type arrangement. Normally the interest costs of government loans are relatively low resulting from a low risk profile; for Latvia in the current financial market a fixed interest rate of 3-5 % can be expected. Recently the State Treasury has provided a loan facility for road repairs and reconstruction to the MoT (further to LSR) with 3.228 % interest rate (including the State Treasury service fee of 0.5 %).

A PPP SPV[17] for financing is based on borrowing the major part of the investment sum and can, due to a higher risk premium, be expected to pay approximately 4 % points higher interest rate (e.g. private partners around 7 %) than the Latvian government. A minor part of the investment sum is equity funded, which typically requires an annual rate of return 15-20 %[18]. Based on a 70 % - 30 % proportion between loans and equity the overall interest rate is calculated at 9-10 % for a PPP project. Lower fixed interest rate of 5-7 % can be expected because LSR has invited international financial institutions to finance PPP road projects in Latvia, in particular European Investment Bank, European Reconstruction and Development Bank and Nordic Investment Bank.

PPP's have among others the advantage of life-cycle design and operation, better costs control during construction and efficient maintenance, and in general involving the experience and expertise of the private sector. Eurostat regulations dictate that PPP can be funded 'off the (government) balance' (not part of government liabilities, and thus not affecting the government's liability limit), provided that the infrastructure costs are completely covered by road user charges. This is however not a realistic option for Riga.

Other bottlenecks with PPP relate to:
- in the current financial market private financing > 500 MEuro appears very high [19];
- PPP combined with EU funding is so far not a proven model. The MoF is investigating this funding option, but it is still at a very early development stage and needs detailed analysis. Experience in other European countries learns that this often proves to be complex. For parts of the NTC this construction will be investigated.

More information on these and other aspects of recent PPP experiences in infrastructure development is presented in section 7.7.

The analysis below assumes loan financing for major infrastructure projects (NTC), and a combination of loan and budget funding for smaller investment packages. Indicative calculations are carried out

17 Special Purpose Vehicle for financing.

18 PPIAF, Toolkit for Public-Private partnerships in roads & Highways, march 2009.

19 Source: Capital markets in PPP financing, where we were and where we are we going. EPEC (European PPP expertise centre - a collaboration between EIB, EU and other partners), April 2010.

based on 4 % fixed interest on loan and a repayment period of 16 years. The total available annual budgets, for which scenarios are defined (as shown in table 7.3), are compared with both the investment amounts (relevant to budget funding) and the annual capital costs (relevant to loan financing).

The basis for table 7.4 is the total investment cost[20] for the RPMP. For the annual budgets an average for 2012 till 2020 is used (see table 7.3). This same average is applied for the years after 2020.

table 7.4. Investments and capital costs compared with the total transport budgets for four scenario's

scenario	annual budget RPMP transport investments (MEuro)	investment / Annual budget - ratio	fully loan funded, annual capital cost [1] (MEuro)
Low	75	22	151
middle	96	17	151
High	113	15	151
High+	146	11	151

1) 4 % fixed interest on loan and a repayment period of 16 years

Table 7.4 shows that even in the high+ scenario and the high scenario, the ratio investment amount to annual budget is respectively 11 and 15. The investments mainly need to be loan-financed (possibly PPP). The resulting annual capital costs (including maintenance) are even in the high scenario substantially higher than the total annual budgets. In the high+ scenario the annual capital costs and the annual budgets are more or less equal. This analysis shows that only in favourable conditions it will be possible to finance the complete RPMP till 2025. In the low and middle scenario complete realization of the RPMP before 2025 is not possible. It is also remarked that maintenance cost of the new investments also require additional budgets.

In addition the general context of the Latvian economy and government budgets should be put forward. The first priority of the Latvian government is to reduce the next year's state budget with around 400 million LVL, and in general it seems that infrastructure investments need to be postponed until the restructuring of government budgets is completed and the economy is growing again. It is also noted that, when budgets for transport infrastructure are increasing again, an emphasis on recovering of major periodic maintenance of neglected infrastructure appears recommendable.

With this analysis in mind realization of the complete RPMP till 2025 as presented in this report seems only realistic in favourable circumstances. Therefore, prioritization of the RPMP measures has been included in this report, also postponing several measures on a longer term till after 2025. Furthermore, currently a study for financing the NTC is done by PWC, also investigating the possibilities to reduce the investments needed. After finalization of this study a more detailed financing plan for the RPMP can be prepared by the MoT together with RCC.

7.6. Loans and liabilities

Several laws and regulations limit the capacity of Latvian public authorities to borrow funds or increase liabilities in another way. The national borrowing capacity is limited because it is constrained due to obligations to international lenders (IMF, the World Bank and the EU).

The Latvian government intends to gradually fulfil Maastricht criteria by 2012 and reach a fiscal deficit of 8.5 % of GDP in 2010, 6 % of GDP in 2011 and 3 % of GDP in 2012. Pursuing such tight fiscal policy the Latvian government has a limited capacity to raise debt financing for support of transport infrastructure projects including RPMP. This explains why in the Law on State Budget for 2010 national government or municipalities can undertake liabilities only in case if such liabilities are needed to co-finance

[20] The table is based on a total investment of 1,637 MEuro (economic value)

EU funded projects (an exception is PPP concession type agreements, but this case is most likely not appropriate to RPMP due to the reasons mentioned above).

The EBRD and EIB are the two main international financing institutions for Latvia. Also the Nordic Investment bank (NIB) plays an important role. Appendix XVI gives information on the NIB, EBRD and EIB in relation to provision of loans for infrastructure projects as well as information on various laws and regulations relevant to public loans and other liabilities such as PPP contracts. It can be concluded from this information that the municipalities have quite limited capacity to borrow or to increase their liabilities in general.

Financing by EBRD, EIB and NIB (in PPP) may not lead to lower costs of financing of the project:
- EBRD would apply the commercial banks rate level;
- EIB would apply its low rates up to limited loan size (in the magnitude of Euro 100 m) of structured finance portion. If EIB provides guaranteed tranche on top (but only up to 50 % of total costs) this would be provided assuming premium for the guarantee, which would be comparable with market rates of commercial banks for such premia. It is also possible that EIB may require sovereign guarantee in a PPP structure in which case the financing costs would be lower;
- NIB would be somewhere between EIB and EBRD.

7.7. PPP road projects and private funding

Appendix XVII gives information on recent experiences with PPP funding in road investment projects. This information leads to the following conclusions for the RPMP:
- PPP projects combined with EU-co-funding are unlikely to be realized in the short term, because this is a very complex set-up with very few successful examples. Therefore PPP projects should be either entirely private financed or private financed with co-funding by the public authorities. These options in most cases create a financial liability for the public authorities for the contract period. In the case of public co-funding of the project an additional funding requirement for the investment is created;
- when the capital and maintenance costs can be fully paid by the road users there will be no liability to the government. Due to the risks involved in measures to reduce traffic demand and lower traffic demands by a decline in the economical situation, investors are currently not willing to accept such a type of PPP project;
- the first priority for the public authorities should be to utilise the limited public funds to co-finance EU funded projects;
- in case after the full utilisation of EU funds some public funds for investments in transport infrastructure are still available, PPP transport projects could be considered. These public budgets can be used for covering liabilities after the infrastructure has been realised;
- in the aftermath of the global financial crisis it will be difficult for Latvia to interest private parties to invest in transport infrastructure, even more so because Latvia has no experience in these arrangements and the new PPP legal framework is at the early stage of implementation. This situation increases the initial cost and the risk of aborted negotiations makes investors even more careful. However, these judgments will be verified at the end of this year (the bid submission date is 30 September 2010) when bid evaluation will be completed for the first PPP roads tender in Latvia (Riga – Senite section of motor road E77/A2);
- PPP projects should be sufficiently large and long term in operation to allow for a return on investment including initial cost (advisory, banking). A 50 MEuro project is an indication for a minimum project size. On the other hand, in view of the scarcity of capital the project should not be too large (< 500 MEuro).
- A few advantages of PPP compared to loans have to be mentioned. Part of these advantages are related to the current difficult financial situation due to the economic crisis which is considered to be only temporary.
  - Latvia/ RCC currently find it extremely difficult to borrow on the commercial markets Therefore all available sources need to be examined carefully;

- Latvia's credit default swap rate indicates overall costs of raising state funds at 5-6 % for 5 to 10 year paper which is in itself, expensive;
- Generally speaking sovereign borrowing will always be cheaper than a PPP with a sovereign (or sub-sovereign) counterparty because of project risk, which applies for any country, so on its own it cannot be a reason for not proceeding with a PPP
- Procuring the project from private money after PPP evaluation may save on capital expenses and operational costs compared to traditional procurement..

7.8. Funding of the RPMP measures

Tables 7.5 and 7.6 present the project types in the RPMP, the investment amounts of these project types and the relation with the current EU programme 2007-2013. The projects are listed in order of planning for implementation and priority. The projects with annual investments and the long term projects have been included at the end of the table. The NTC is dominating (75 %) the total amount of 2,127 MEuro, however the cost of the NTC is still under review and it is probable that the costs can be lowered. Without the NTC the investments in public transport comprise 60 % of the investments.

With the exception of the RCC 'capital budget for transport investments', approximately 25 % of the total public budget is available for transport investments; all budgets relevant to RPMP investments relate to EU funds and policies. The potential for funding the various types of RPMP projects therefore mainly depends upon the EU policy for transport measures in the next programming period 2014-2020 (see below). Since these funds and its transport policies have not been defined yet, it is not possible to conclude which type of measure can be funded from which source. It is recommended that in the negotiations for the next programming period the authorities ascertain that RPMP activity types with the highest investment amounts will become eligible for funding. This concerns particularly constructions of roads, railway stations, tramline to the airport and tram extensions in Riga. The funds from the RCC capital budget can be allocated without restrictions to any transport investment. It is therefore recommended to allocate these funds to priority projects which will not be eligible for EU funding.

Other factors in relation to the funding of RPMP projects are:
- the total size of the transport budget for the RPMP. This is calculated in the middle scenario at approximately 120MEuro per year;
- the phasing of the RPMP projects. In the appendices IV and V a phasing of RPMP road projects is presented for the short, middle and long term of respectively 45 %, 28 % and 27 % (without NTC). However, considering the large amounts involved especially the investments in the NTC (appendix IV) and public transport (appendix VI) are relevant to the phasing. A more or less equal distribution in time for the RPMP investments therefore can be assumed.

Based on the available budgets, the fairly equal distribution of investments in time and the anticipated eligibility of most RPMP projects for EU funding it can be concluded that at least the RPMP projects excluding NTC can be funded in the next 10 years from 2014 onwards. Some projects could already be funded from 2011 onwards from the RCC capital budget for transport infrastructure (approximately 25 MEuro per year).

table 7.5. Investments in roads and streets for the preferred variant[21]

measure number	project name	description	total investment amount (x € 1,000)	eligible for funding in current programme	fund
RD1s	Stage 3 of Southern Bridge	2x2 lanes, 70 km/h on West bank till A7	23.000	yes	CF
RD6m	Connection ring structures (part of eastern arterial design)	connection between city ring and city centre ring	2.000 in budget of eastern arterial completion	yes	CF
RD10s	Reconstruction of Daugavgrivas iela - K. Valdemara iela junction Construction of the Ranka Dambis tunnel	Total reconstruction of junction Construction of tunnel	34.000 70.000	yes	ERDF CF
RD4m	Northern Transport Corridor	stage 1 in the first RPMP period, the other stages after 2017, lowering of investment amount is currently studied	1.561.000	yes	CF TEN-T
RD2s	Reconstruction of A. Caka and Brivibas to one way	change of road layout to support one-way system, 3.7 km	1.575	yes	ERDF
RD3s	Reconstruction Terbatas iela and K. Barona iela to NMT/PT only	total reconstruction of 4.3 km to NMT/PT only	903	yes	ERDF
RD9m	Western Arterial: connection Kurzemes Prospekts - Jurkalnes iela including tunnel	2x2 lanes, 50 km/h, 1.7 km tunnel	5.100 25.000 total 30.100	yes yes	CF / ERDF
RD5m	Bypass for Valmiera iela in City Centre Ring between Pernavas iela and Satekles iela	1x2 lanes, 50 km/h, 1,7 km upgrade and 1,7 km new	2.550 5.100 total 7.650	yes yes	ERDF ERDF
RD7m	Downgrading of Akmens bridge	from 2 x 2 to 2 x 1, investments for NMT and PT infrastructure, 0.6 km	300	possibly	ERDF ')
RD8m	Reconstruction of connection to Vansu bridge	reconstruction connection to the north, closure connection to the south	500	yes	ERDF
RD18a	Traffic management upgrade	PT-priority at certain intersections, monitoring system	5.000	possibly	ERDF ')
RD17a	Reconstruction of city centre ring where necessary	upgrade to 50 km/h on the whole city centre ring	5.000	yes	ERDF
RD19a + RD29a	Additional budget for traffic safety measures	Extra budget for improving traffic safety mainly in Pieriga	5.000	possibly	ERDF ')
RD16a	Traffic calming city centre	change of speed limit and design to 30 km/h	5.000	possibly	ERDF ')
	total roads and streets		**1.751.028**		

') Where indicated possible there has to be further investigated whether the ERDF, CF or other programs like LIFE+ or JESSICA can provide financial contribution for these projects.

[21] The study projects and long term projects (for the period after the RPMP) have not been included in this table. Furthermore, also reference projects without complete finance are not included in this table. However, these projects are included in the action program.

table 7.6. Investments in public transport for the preferred variant

measure number	project name	description	total investment amount (x € 1000)	eligible for funding in current programme	fund
PT17	Central Station: Upgrade and rerouting of tramway for better connection of tram and train (from Akmens bridge, 13 Janvara iela, Marijas iela, Elisabetes iela to K. Barona iela)		10.000	possibly	ERDF ')
PT18	Reconstruction Gogola iela with separate PT lanes and new (trolley)bus stops		6.000	possibly	ERDF ')
PT23	extend the trolleybus network from Pilsonu iela (Kliniska Slimnika) to Marupe (Sejas iela or Brueklenu iela) (2700 meters); eliminate diesel-buses on this route.		1.755	possibly	ERDF ')
PT24	extend the trolleybus network with 1400 meters from Ziepniekkalns to Ziepniekkalns DP while eliminating diesel buses on the same route.		910	possibly	ERDF ')
PT25	extension of trolleybus from Sargandauva to Aldaris, including improvement of street, new terminal in Aldaris and at Brasa		1.200	possibly	ERDF ')
PT1	P&R facilities at 50 % of all stations, including B&R facilities	35 stations, total of 1400 places in Pieriga	4.200	yes	ERDF
PT21	create a separate bus lane on Brivibas iela and A. Caka iela in the opposite direction of the one-way direction of cars;		1.000	yes	ERDF, CF
PT15	reform Barona iela into exclusive tramway domain including high quality pedestrian zone and bicycle lanes	tram Riga	4.000	yes	ERDF, CF
PT6	Upgrade of Riga central station, including new covered platforms, bicycle facility		25.000	yes	ERDF
PT16	transfer points to improve interchange between tram, trolley and bus		5.000	yes	ERDF, CF
PT20	Park and Ride facilities in Riga at 4 locations, new 1000 spaces in total, improvement of walkway to stops, information		3.500	possibly	ERDF ')
PT26	Separate bus lane for trolleybus line 18 in Dreilini		5.500	possibly	ERDF ')
PT26	changed route for trolleybus line 18 in Dreilini and extended in Mezciems to a new terminal		2.880	possibly	ERDF ')
PT13	tram Riga	new track (0,6km) and terminal (4 mln) in Dole at P&R (P&R not included)	8.800	possibly	ERDF ')
PT19	upgrade of bus station at Central Station, removal of minibus stops at Central Tirgus		2.000	yes	ERDF, CF

measure number	project name	description	total investment amount (x € 1000)	eligible for funding in current programme	fund
PT27	Separate bus lanes, priority measures on new trolleybus lines		20.000	possibly	ERDF ')
PT3	Elimination of speed restrictions on track		27.000	possibly	ERDF ')
PT4	Repairs, new sleepers and/or ballast, total	35km	14.000	possibly	ERDF ')
PT10	shelters providing waiting comfort on 100 % of tram-way stops towards city centre and 80 % in opposite direction	tram Riga	2.000	yes	ERDF, CF
PT7	upgrade the tramway network by renewal of old tracks	tram Riga	115.000	possibly	ERDF ')
PT8	remove old tracks of tramline 2 between Tapesu iela and Lielirbes iela, line 5 between Eksporta llea and Milgravis; line 10 between Bisumuiza and Ziepniekalna iela	tram Riga	1.030	possibly	ERDF ')
PT11	dynamic displays showing actual departure times or waiting times, including hardware and software in vehicles	tram Riga	2.000	possibly	ERDF ')
PT5	Upgrade of small stations: platforms of 55 cm, clocks, information, shelters, safety of railway crossings to platforms	approx. 43 small stations, 24 larger stations	23.125	yes	ERDF
PT5	Upgrade of larger stations: platforms of 55 cm, clocks, information, shelters, safety of railway crossings to platforms		25.650	yes	ERDF
PT28	improvement of comfort and safety of bus stops in Pieriga	regional busses	3.000	yes	ERDF, CF
PT9	tramway platforms for easy access to passengers, in combination with introduction of new low floor trams, reconstruction works of roads	tram Riga	5.000	yes	ERDF, CF
PT12	tram connection to the airport	shortcut 0,7 km via Barinu iela, shortcut 0,6 km via Maza Nometnu iela, 5 km new tracks; 2 viaducts	80.400	possibly	CF ')
PT14	tram Riga	new terminal of tramline 5 at Andrejsala	1.000	possibly	ERDF ')
PT2	New station at Urban Development West bank (replacement of Tornakalns station)		20.000	yes	ERDF
PT22	extend the trolleybus network from Petersala iela to Andrejostas iela (Andrejsala)		650	possibly	ERDF ')
	total public transport		**421.600**		

') Where indicated possibly there has to be further investigated whether the ERDF, CF or other programs like LIFE+ or JESSICA can provide financial contribution for these projects.

All investments mentioned in tables 7.5 and 7.6 are included in the cost-benefit analysis (CBA, section 3.6 and Appendix III), with the exception of measure RD10s Reconstruction of Daugavgrivas iela - Valdemara iela junction and construction of Ranka Dambis tunnel, which were added in a later stage. Besides this, a few investment amounts have been lowered based on recent information. The total effects on the CBA of these changes are very small.

The investment amounts of tables 7.5 and 7.6 are excluding costs of land acquisition for new constructions and excluding a risk percentage for unforeseen costs. The costs of land acquisition are in fact restricted to investments in new constructions on land which is owned by private people or companies. The square metres for new constructions have been quantified and prices per square metre have been valued, separately for areas in the city centre, outside the city centre, in the outskirts or suburbs of cities and in rural areas. The majority of these costs are needed for new road constructions, especially the NTC and for the construction of the tramline to the airport. In the Action Program the land acquisition costs for the first seven years have been included in the total investment amount.

ongoing projects
Apart from the projects mentioned in table 7.5 and 7.6, Latvian State Roads has recently reviewed four feasibility studies on possible road projects. These are:
- Cohesion Fund project E22 (Riga bypass A4 - Tinuzi - Koknese; this project is currently under construction);
- reconstruction of E77/A2 Riga bypass - Senite;
- construction of E67/A7 Kekava bypass;
- reconstruction of E67/A4 Riga bypass.

The total investment amount of these projects is expected to be around 380 MEuro (explanation of cost estimates in appendix III, table III.2)[22]. Furthermore, several reference projects have not been completely financed before the start of the first implementation period of the RPMP. The necessary investments have been included in the action program.

loans
Loans can in principle be used for any type of RPMP project/measure, and are likely of particular importance in relation to the financing of NTC. Both the national and municipal authorities are currently severely restricted in their borrowing capacity (see appendix XVI). Like in the current programming period the borrowing capacity can be sufficient to co-finance transport sector projects if financing terms for the new EU funds programming period 2014-2020 will be similar to those of the current programming period.

7.9. Financing of the Northern Transport Corridor
As shown in table 7.5, the NTC requires the main part of the total investment amount of the RPMP. Therefore financing of the NTC requires special attention. From earlier studies the most capital intensive option, leading to the investment amount of 1,561 MEuro in table 7.5, is being preferred from options examined and analysed. The consultant AECOM is currently carrying out a study on possibilities to lower the NTC investment costs. The results will probably be available by the end of 2010. Lower costs of the NTC can be expected: for instance a submerged tunnel instead of a bridge leads to a reduction of approximately 150 MEuro (see NTC factsheet in appendix I).

RCC has commissioned the consultant Price Waterhouse Coopers (PWC) to investigate the possibilities of financing the NTC. The results of this study are expected not earlier than Autumn 2010. Based on a meeting with officials of PWC in the beginning of August 2010, only a few preliminary conclusions can be mentioned; it has to be emphasised that these conclusions may be adjusted during finalisation of the study.

[22] The estimation of 380 MEuro has been based on the information received till August 2010.

PWC distinguishes different financing options in a roster of options:

- PPP financing – equity, commercial and multilateral debt;
- multilateral sovereign/ sub-sovereign debt (EBRD, EIB, NIB loans);
- bond financing;
- sovereign financing;
- budget financing (sovereign and sub-sovereign);
- EU financing.

Considering the size of the investment of the RTNC it is clear that most if not all of the required budget has to be financed outside the RCC budget.

The results of the PWC study will probably be based on a certain combination of different forms of funding and financing. Because of limited financial resources this combined financing will have to be phased in time (see below under 'mixed financing'). More detailed analysis of financing of the RPMP will be possible only after the results of the PWC study are available.

loans

PWC has contacted several banks and EU-funding institutions to discuss their willingness and conditions to partially finance the NTC.

The multilateral banks typically individually lend up to 50% of the project costs, but subject to a range of different criteria which could lower this percentage. Lending from these institutions to RCC could be individually in the indicative range of 50 - 100 MEur, currently however likely subject to provision of sovereign guarantees (national government guarantee of repayment). However the ability to borrow by RCC is now very limited and this may remain the case at least in the medium term. The EIB and EBRD have indicated that the total estimated investment amounts are unusually high compared to Latvia's GDP. The amount which can not be funded from the banks needs to be funded from EU-funds and from the authorities (the State and RCC).

PPP

PPP is in the current market situation not allowed in Latvia and is expected to remain postponed for the coming years. Consultation of investors has learned that the traditional model of toll roads or toll bridges is not popular anymore due to the risks of reduction of traffic by traffic management measures or economical decline. Instead, investors favour an availability fee paid by the government. It is questionable if this way of financing will be competitive with loans.

congestion charging

Introduction of congestion charging or road pricing is expected to generate limited revenues. Besides this, a substantial part of the revenues is needed for funding and maintaining of the system itself. From mobility point of view it is doubted if Riga is ready for congestion charging or road pricing since there are no good alternative routes available and there is not a fast and modern public transport system which is able to provide a good alternative (see also 5.3).

sale of property

Selling of property or utilities to private companies in order to raise funds for infrastructural projects has to be studied. Due to decrease of the role of the state, decrease of the size of railway and public transport operations and privatisation of state-owned companies in the past two decades there may be real estate or other properties which are not (fully) utilised and which are interesting for private investors..

mixed financing

PWC may propose to study a structure with a combination of maximum use of EU funding, State/ municipal funding and loans from investment banks. For maximum use of EU funding, the project has to be

phased for the next funding period 2014-2020 and the period thereafter. The phases need to have their own necessity as stand-alone projects to be eligible for funding. For phase 1 (right bank) this is undoubtedly true since it will provide better port connections and a better connection with the Eastern Arterial. For phase 3 and/or 4 however, this can be questioned. Therefore it might be considered to change to phasing of the existing phase 1 and a new phase 2 consisting of the existing stages 2, 3 and 4. The investment amounts of the stages 3 and 4 are relatively low compared to stage 2 (which includes the river crossing). For road maintenance, contract management, etc, it should be prevented to have too small sections with different operators.

7.10. Current and future budgets

Based on the assumptions in the previous sections of this chapter table 7.7 presents the expected budgets for RPMP financing in the middle scenario.

table 7.7. Expected public funding sources for RPMP in the middle scenario (x 1,000 Euro)

Middle scenario	Priority 3.3 and 3.2.1 of national strategic reference framework	LSR EU co-financed projects	RCC Transport infra invest- ments	RCC EU financing for transport	Total budget for Riga and Pieriga transport investments
2011	0	0	20,400	0	20,400
2012	0	0	20,900	0	20,900
2013	0	0	21,400	0	21,400
2014	33,200	26,800	22,000	7,800	89,800
2015	33,200	27,500	22,600	5,700	89,000
2016	33,200	28,200	23,100	6,700	91,200
2017	33,200	29,000	23,700	7,200	93,100
2018	33,200	29,700	24,200	7,700	94,800
2019	33,200	30,400	24,700	8,200	96,500
2020	33,200	31,100	25,200	8,700	98,200

RPMP projects cannot be funded from current EU related budgets alone. The state budget for LSR and RCC EU co-financing budgets for the 2007 - 2013 period have already been allocated to specific projects as set forth in Operational Programme 'Infrastructure and Services' of the National Strategic Reference Framework and following Regulations of the Cabinet of Ministers for each activity. It is unlikely that this money will be reallocated. This would be a political decision, which has to be supported by the MoT and the MoF and further approved by the Cabinet of Ministers. In addition, such changes have to be in line with the Operational Programme 3, which is signed between the Latvian government and the EC.

When comparing the RPMP projects with the transport policy in the current programming period 2007-2013, it can be concluded that many of projects(types) currently listed are eligible for funding (see tables 7.5 and 7.6). In the current programming period, projects could have been funded especially from Activities 3.3.1.5 'City infrastructure improvement for a linkage with the TEN-T' and 3.2.1.3.2 'Traffic safety improvement in Riga'. RPMP projects can however also be eligible from other activities in the programme, among other to TEN-R rail (3.3.1.2), port infrastructure (3.3.1.3), airport infrastructure (3.3.1.4), and sustainable public transport system (3.3.2.1). Whether a type of activity is eligible is sometimes debatable. It seems that some of the listed RPMP activities may have difficulty in funding within the current program, which has to be further studied. An overview of the (sub)activities of the EU funds in the current programming period is included in appendix XVIII.

7.11. Revenues of the transport system

This section briefly elaborates on the following potential revenues of the transport system:

- revenues from parking;

- revenues from public transport;
- road pricing;
- rail infrastructure charging.

parking revenues
In 2009 Rigas Satiksme has managed 3,864 parking places, which generated a revenue of 4,4 MEuro[23]. The paid parking regime is operated six days per week throughout the year. Based on information provided by Rigas Satiksme, the average daily revenue per parking place is 3.65 Euro. The average number of customers per parking place per day is 3.0. These figures include all kinds of possible payments like paid parking at parking meters, resident cards, monthly cards, reserved parking etc. The total revenue for parking is approximately 130 % higher than the costs. The number of paid parking places inside the Riga Centre will increase this year and in the coming years. This will most likely increase the income generated by paid parking as well.

According to existing policy, 40 % of the yearly income generated by paid parking is available for Rigas Satiksme for new investments and maintenance. The other 60 % of the yearly income generated by paid parking is used to subsidize the operation deficits of the public transport part of Rigas Satiksme. The parking policy described in the RPMP accounts for a little increase of paid on-street parking places under strict regulations in the Riga City Centre. The majority of increase of parking places should take place at the Park and Ride locations and the necessary amount of parking places at new developments according to the building regulations. The additional income earned from paid parking should be used to partially finance the Park and Ride system.

revenues from public transport
The revenues for 2020 are estimated with data of Rigas Satiksme for 2008 and are based on the 2008 price level. This means that the revenues without correction for decreased passengers number would be 72.0 MEuro. In 2020 the expected revenues however has been decreased because of lower passenger volumes due to increasing car-use. The NEA transport model estimates a drop of 27 % until 2020 if no measures would be taken (reference). This would lead to revenues of approximately 52,5 MEuro. With the measures as proposed in the RPMP the number of passengers will rise by 18 % compared to the reference situation. The revenues then will be 60.4 MEuro. For train and regional buses no differences in revenues between 2010 and 2020 have been calculated.

A remark can be made on the subsidising system. The operational deficits of Rigas Satiksme and Pasazieru vilciens are compensated by the authorities on the basis of the actual costs and revenues of the annual accounts. This system does not provide incentives for the companies to save costs or to boost the revenues, for example by improving the efficiency or the quality of the operation. It would be better to introduce such incentives by applying a system of norms for the cost level and the revenue level related to a certain level of supply of the transport.

road pricing
No decision has been made on the implementation and on the eventual system of road pricing. Therefore no indication of revenues can be presented. The implementation of such a system will also affect the transport forecast, and thus the economic analysis.

rail infrastructure charging
Reorganizing the structure of the public transport organisation in Riga and Pieriga should include a change in the existing financial conditions for railway transport. Currently the railway operator Pasazieru vilciens has to pay a fixed fee for using infrastructure tracks and stations, without taking into account for example the length or the number of axes of the trains. It would be more fair to apply a flexible fee which is based on the capacity of each train. Besides this, the fees for passenger trains may be differ-

[23] Extrapolated from the first nine-month in 2009.

ent from the fees for freight trains, because the markets for passengers and freight rail traffic are separated and the operating conditions are different. Both aspects will improve the market conditions for railway transport and can make railway transport more competitive. The system of charging for the use of rail infrastructure cannot be restricted to Riga and Pieriga but has to be applied for the whole country.

APPENDIX I RPMP factsheets

Appendix I
fact sheets

The following fact sheets are included in this appendix:

1. One way system Brivibas iela and A. Chaka iela;
2. Brivibas iela crossing the railway;
3. Barona iela and Terbatas iela priority NMT/PT;
4. Traffic Calming: Bicycle lanes and suggestion strips;
5. Traffic Calming: Narrowing of streets and intersections;
6. Traffic Calming: physical speed reducing measures;
7. Traffic safety measures – quick wins;
8. Adaptive traffic lights and monitoring;
9. PT-priority and facilities operational transport;
10. Improved public transport system for the municipalities of Pieriga;
11. Railway stations;
12. The Central Station Area;
13. Park and ride in Pieriga;
14. Akmens bridge and 11. novembra krastmala;
15. Eastern connection City ring - City Centre ring;
16. Reconstruction of public transport stops in Gogola iela;
17. Development of the Northern Transport Corridor;
18. Transport value of a new A4-A5 connection;
19. Transport value of a new A7-A8 connection;
20. Road transport over the network.

factsheet 01

one way system - Brivibas iela and A. Caka iela

Description of the project

Turning the Brivibas iela (between Lacplesa iela and Pernavas iela) and A. Caka iela (between Lacplesa iela and Pernavas iela) into a one way system.

Refers to specific measures

RD2s, PT21, PT10

Objectives of the project

Improving traffic flow and creating space for a dedicated **public transport** lane.

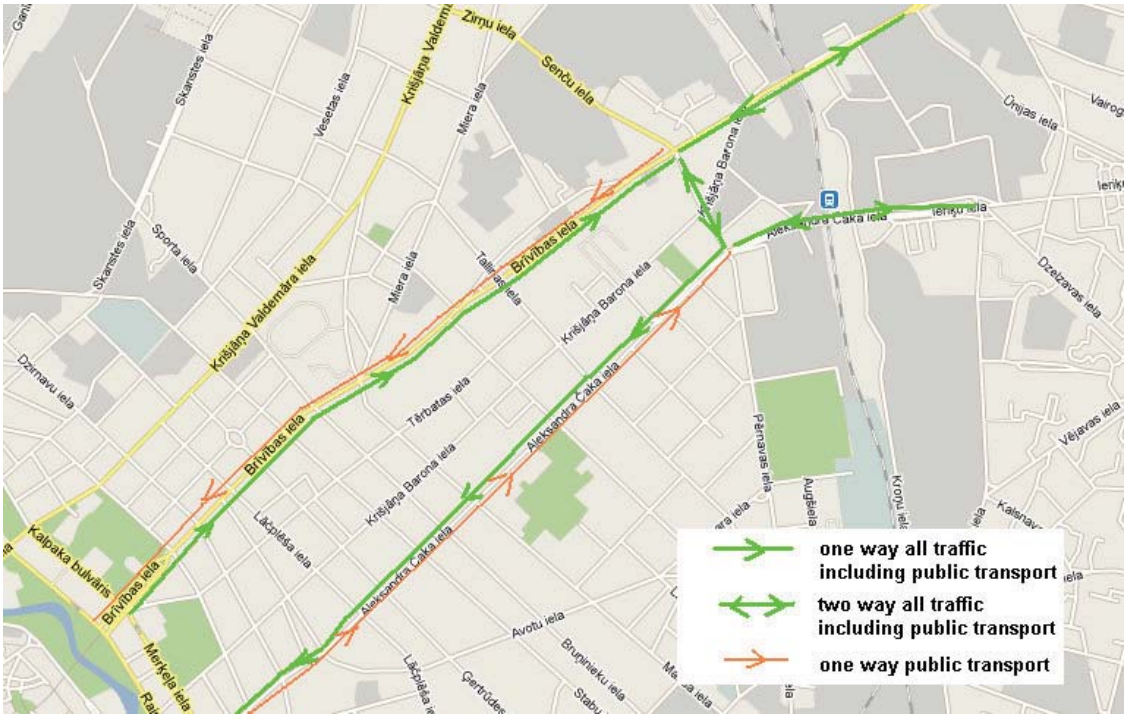
Dependencies

Both existing roads serve as main entrance road to Riga. Therefore closing down these roads for reconstruction will probably cause severe traffic delays. Also rerouting of existing connection roads is necessary to ensure a proper and understandable road structure. Furthermore this project is related to the traffic calming measures at the K. Barona iela and the Terbatas iela (see corresponding fact sheet).

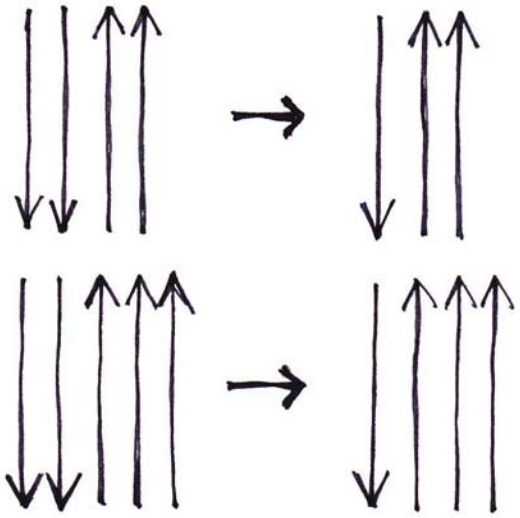
Design issues

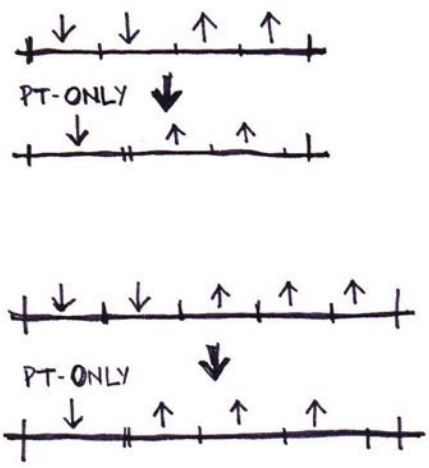
Basic principle of the road design is to reduce the number of lanes on the Brivibas iela and A. Caka iela to create space for a dedicated public transport lane. Where there are four lanes (two in both directions) in the existing situation, there will be three lanes (two for all traffic in one direction and one dedicated for PT in the other direction) after implementation of the project.

The same for locations with five lanes available in the existing situation which will be converted to three lanes in one direction and one public transport lane. This choice is made to make sure that in case of queuing vehicles, buses in opposite direction will have enough space to maintain a proper travel speed between intersections in a safe way.

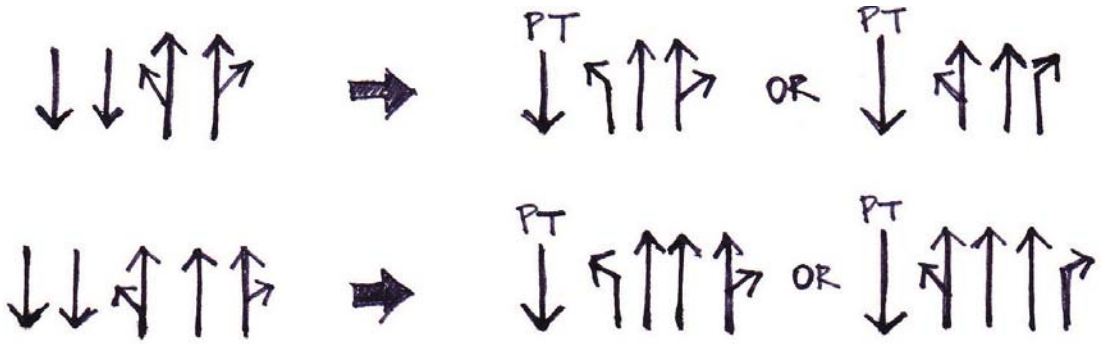


At intersections basically the current number of lanes is kept the same; only the intersection layout will be redesigned to add exclusive lanes for right or left turning traffic only. This shall be based on the local situation and will improve traffic safety and traffic flow.





The new situation is mainly realised by 'soft' measures like changing road markings, road signs and traffic lights. With renovation or major maintenance, the new road design can be more tailor-made for example with physical barriers between bus lane and other lanes if found necessary. Where there is a median strip or shoulder in the middle of the road, lane width is not changed.



Measures included

1. PT priority at traffic lights;
2. upgrade of existing public transport stops;
3. expanding of one way system.

Stages (short, medium, long term)

Short term — design study, intersection capacity calculations and traffic light controller programming;

Medium term — construction works/amendments to the road profile;

Long term — after completion of the NTC there will be lesser traffic on both streets; as a result traffic light controllers probably need to be reprogrammed.

Side effects

The one way system causes a shift in routes in especially the area between the Brivibas iela and A. Caka iela. Therefore the Tartabas iela and the Barona iela need to be reconstructed at the same time to prevent from a shift of traffic to these roads.
Creating PT-lanes gives operational transport vehicles more opportunities to rapidly reach their destination in case of emergencies.

Cost category

EUR 2.775.000,-- excl. VAT and design study.

Stakeholders involved

Riga City Council Traffic Department, Rigas Satiksme.

Recommendations

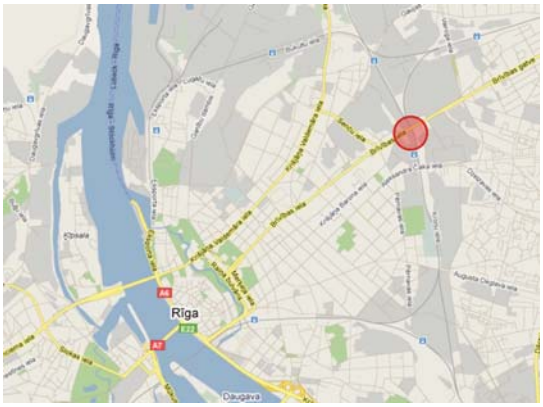
Specific study for redesign of existing system with turn prohibitions.

factsheet 02

Brivibas iela crossing the railway

Description of the project

Improving traffic flow and traffic safety on the bridge over the railway at Brivibas iela.



Refers to specific measures

RD2s.

Dependencies

None.

Objectives of the project

The railway bridge in the Brivibas iela is a well-known bottleneck in the traffic flow at Brivibas iela. The main objective of this project is to widen the traffic lanes and add a lightweight NMT crossing facility to the existing bridge.

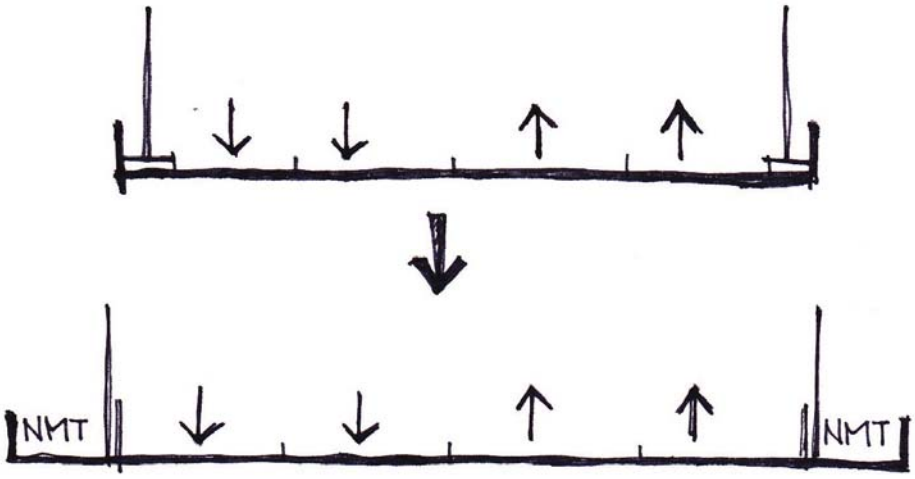
Design issues

The current bridge is not fit for the actual number of lanes. This results in a reduced flow and probably unsafety. During observations it was well visible that in the current road profile it is possible for passenger cars to drive next to another. When trucks or buses pass the bridge, there are no or hardly any passenger cars who dare to overtake them due to the narrow lanes.

Space for four full size lanes can be created by placing both sides of poles supporting overhead cables at the outside of the current construction with a new connected lightweight NMT bridge. This will improve both traffic flow and traffic safety. Besides this, the bottleneck in the NMT routes will be solved as well.

Measures included

None.



Stages (short, medium, long term)

Short term	design study and construction works;
Medium term	-
Long term	in a longer term it is advisable to replace the old bridge with a new and wider bridge.

Side effects	Cost category
None.	Low.

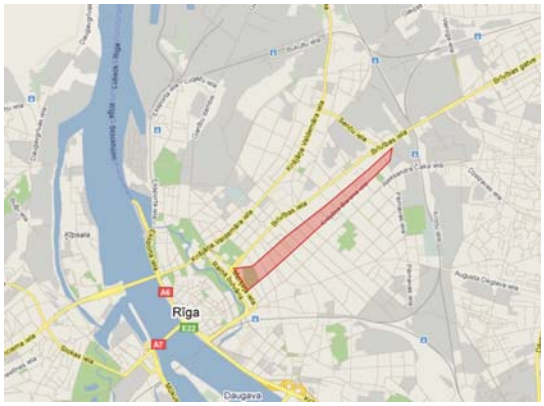
Stakeholders involved	Recommendations
Riga City Council Traffic Department, Rigas Satiksme.	Specific study for design.

factsheet 03

Barona iela and Terbatas iela - priority NMT/PT

Description of the project

Priority measures for public transport and non-motorized transport at the Barona iela and the Terbatas iela and supporting measures for one-way system at the Brivibas iela and A. Caka iela.



Refers to specific measures

RD3s, RD16a, PT9, PT15.

Dependencies

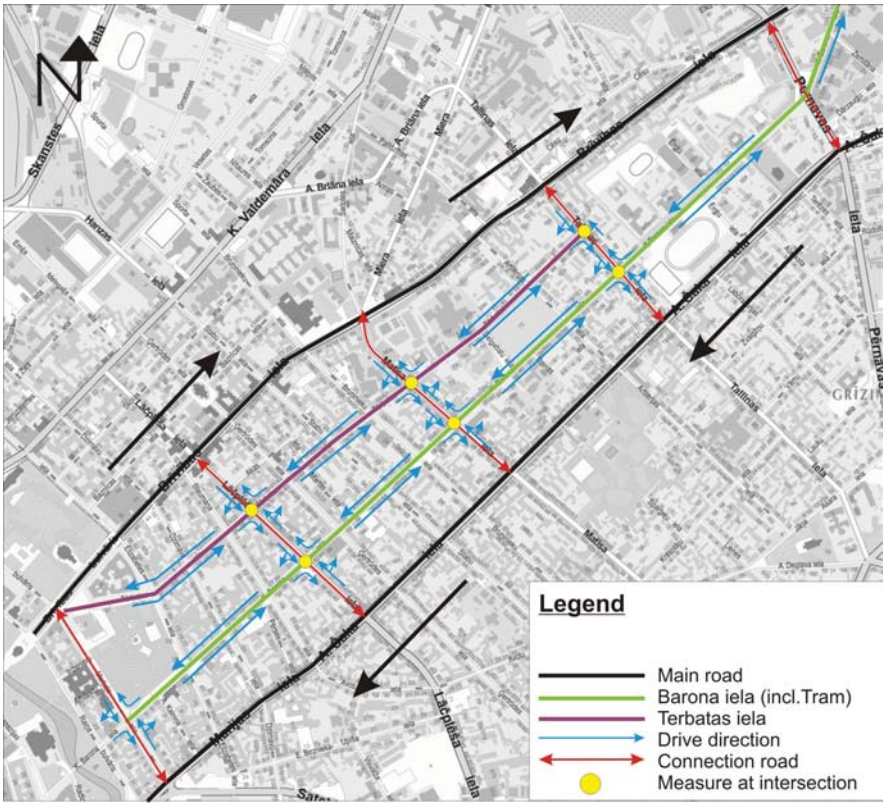
1. Both reconstructions are linked to each other to achieve optimal success.
2. Review of current one-way system in the area between the A. Caka iela and Brivibas iela for optimal functioning.
3. Preferably in combination with one-way system at the Brivibas iela and A. Caka iela.

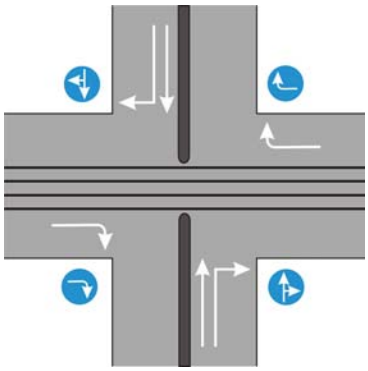
Objectives of the project

1. Turning the Barona iela into a tram corridor with priority measures at traffic lights and create a traffic calmed area which favours cyclists in stead of passenger cars by measures to discourage transit traffic.
2. Turning the Terbatas iela into a similar traffic calmed area as the Barona iela, but without exclusive tram lanes.
3. Improvement of liveability at the Barona iela and Terbatas iela and surrounding streets.

Design issues

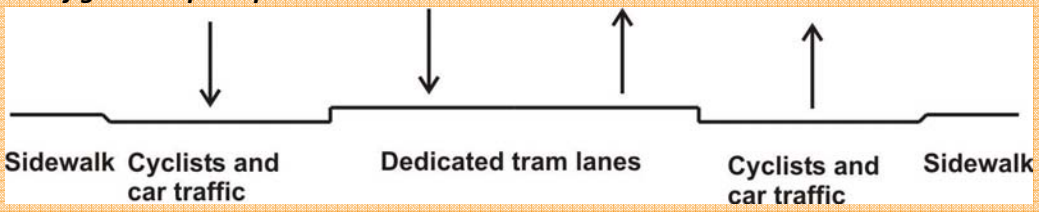
Basic principle for this project is to achieve a traffic calmed area by eliminating possibilities for transit traffic to use these streets as alternative route for the Brivibas iela and A. Caka iela. To achieve this, tram lanes at the Barona iela need to be elevated to block passenger car traffic crossing the tram lanes even at some of the existing intersections. A similar approach is proposed for the Terbatas iela where the lane separation is proposed by a concrete barrier of at least 20 cm high. Apart from discouraging transit traffic to use these streets, it also helps to increase the travel speed of the trams. See figure on the next page for the basic principle for both streets.



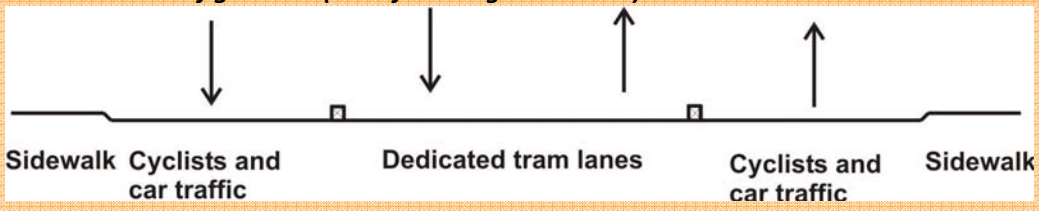


Intersection configuration principle for yellow dotted intersections.

Lane configuration principle:



Alternative lane configuration (use of existing tram track):

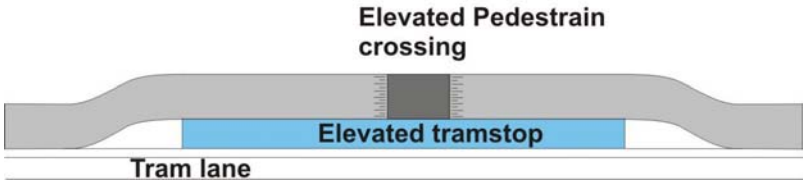


Furthermore several intersections need to be reconstructed with barriers to block transit traffic. The width of the passenger car lane will be narrowed to approximately 3.0 - 3.5 meters to serve as mixed lane for cyclists and necessary passenger car traffic in a so called bicycle street. See example picture.

Example picture of a bicycle street with adjacent parked cars

At tram stops / platforms at the Barona iela the road will be elevated to provide an optimal road crossing for pedestrians and to alert passenger car traffic to be careful for crossing tram passengers. This has a positive effect on traffic safety, also by providing a tram stop with shelter facilities adjacent to the tram track. While reconstructing the Barona iela the current location of the tramway stops might have to be reallocated to nearby locations where there is enough space available to create the adjacent tram stops. See figure below for a principle drawing of an adjacent tram stop.

Adjacent tram stop principle



Measures included

1. Traffic calming measures
2. PT priority at traffic lights
3. Upgrade of existing tram stops
4. Improvement of traffic safety

Stages (short, medium, long term)

Short term design study and construction works;

Medium term installing public transport priority system at traffic light controllers, installing Passenger Information System at the tram stops;

Long term -

Side effects

Turning the Barona iela and the Terbatas iela into a traffic calmed area might lead to some extra kilometres to travel to and from destinations near these roads.

Cost category

EUR 5.000.000,-- ex. VAT and design study.

Stakeholders involved	Recommendations
Riga City Council: City Development Department, Traffic Department, Rigas Satiksme	Specific study for redesign of existing system with turn prohibitions at surrounding streets. Communication with residents and companies whom are affected by this project at an early stage.

factsheet 04

traffic calming: bicycle lanes and suggestion strips

Description of the project

The introduction of bicycle suggestion strips or even specific bicycle streets where passenger cars are 'guests' are traffic calming measures and can also be used to create a bicycle network.

Objectives of the project

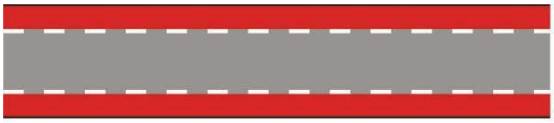
Bicycle suggestion strips are aiming at reducing speed by a visual narrowing of the traffic lane. The underlying idea is that passenger car drivers recognize the street as a street for origin or destination traffic and not for transit traffic. Therefore, creating bicycle suggestion strips at main routes in the bicycle network will support a clear road hierachy.

A recent development in the Netherlands is the introduction of bicycle streets. A bicycle street is a street where cyclists are the main users and passenger cars are seen as 'guests'. This type of traffic calming measure and bicycle supporting measure has become popular in the Netherlands at main bicycle routes where constructing dedicated bicycle paths is not possible. The best results can be achieved when passenger cars travel in one direction and cyclists in two directions. In both situations parking is preferably situated adjacent to the road or street.

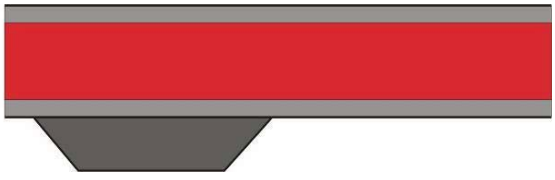
Bicycle suggestion strips

Bicycle street

Bicycle suggestion strips top view



Bicycle street top view



factsheet 05

traffic calming: narrowing of streets and intersections

Description of the measure

Narrowing of roads and intersections to reduce speeds by forcing traffic from two directions to wait for the other direction at the narrow sections.

Objectives of the measure

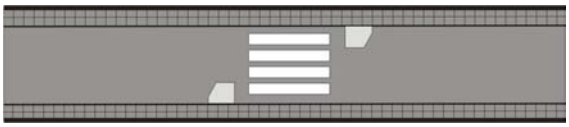
Narrowing of roads and intersections is commonly used to reduce travel speeds and improve visibility of intersections. For traffic calming projects this measure is a quite easy to implement, cost-effective measure with a guaranteed success. When installed at locations where the traffic volumes are high, this measure will create queues which make the route less attractive to unwanted transit traffic. Commonly this effect will disappear after a period of time when transit traffic uses another route and a new balance is set.
Compared to the well-known speed bump, these measures are more friendly for the surrounding residents since they cause no soil vibration.

Design issues and images

Three basic principles for narrowing of streets are:

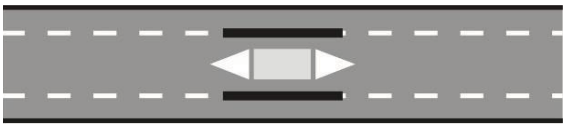
- ***alternately blocking one lane;***
- ***narrowing to one lane in the centre of the road;***
- ***narrowing at intersections.***

Examples of measures to alternately blocking one lane

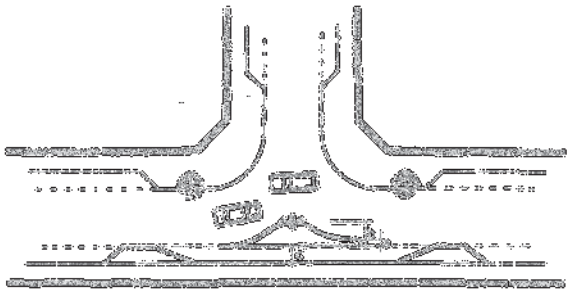


As the examples show, these measures can be integrated in a pedestrian crossing or can be used at streets with bicycle facilities. The same is applicable for the narrowing of the lane in the centre of the road as the example on the next figures shows.

Example of narrowing in the centre of the road

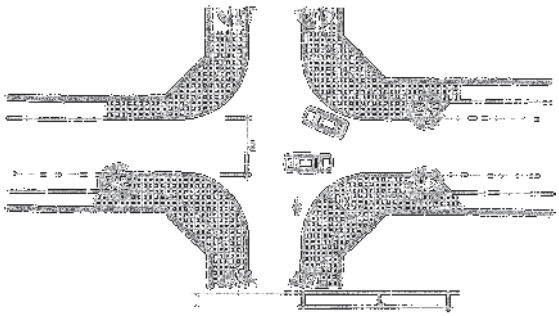


Example of narrowing at intersections



Like the example on the right shows, narrowing at intersections can be supportive to parallel parking places at the streets.

An alternative for narrowing of an intersection is given in the sketch drawing below. This type of narrowing decreases the area covered by the intersection which helps to reduce speed at the intersection and improves visibility and traffic safety.

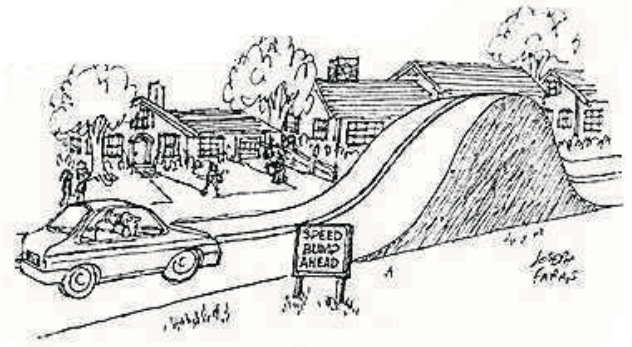


factsheet 06

traffic calming: physical speed reducing measures

Description of the measure

Measures to reduce speed on an intersection or road section.



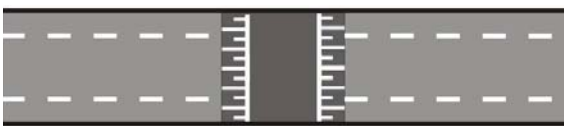
Objectives of the measure

Objectives for physical measures are obviously speed reduction but also improving visibility or attention at intersections or road crossings for pedestrians and/or cyclists.

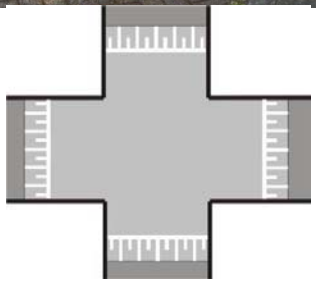
Design issues and images

Speed bumps and the plateau (type of speed bump for application at intersections) are widespread speed reduction measures and can be found all over Europe. They have been proven to be successful but are not very popular amongst nearby living residents, public transport companies and travellers with e.g. back problems. See example pictures and sketch designs below.

Example of a speed bump

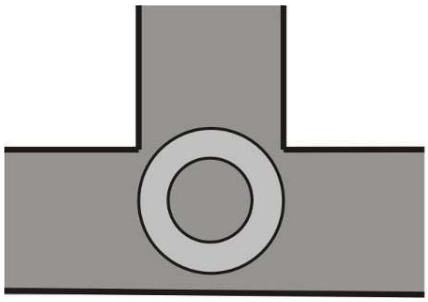


Example of a plateau at an intersection



The downside of constructing speed bumps and especially plateaus is that these are quite expensive compared to the non physical measures like the narrowing of streets. The main reason is the amount of foundation material and labour costs needed to construct a speed bump or plateau. This downside has led to a number of cheaper solutions to achieve similar objectives but which are not as costly. An example is the pushpin which is frequently used at intersections in residential areas. The next figures show an example of a pushpin.

Example of a push pin



factsheet 07

traffic safety measures - quick wins

Description of the project

Quick wins for improvement of traffic safety.

Refers to specific measures

RD19a, RD29a.

Objectives of the project

Improvement of **traffic safety** not always depends on large investments in upgrading of infrastructure. In this factsheets several quick win measures are given (in order of costs):

1. Placement of warning signs at dangerous locations and or radar speed indicating signs;
2. Improving visibility of intersections by removing blocking objects and installing lighting;
3. Upgrade of common used pedestrian crossings with lighting, speedreduction and warning signs as intermediate step towards split-level pedestrian crossing;
4. Adding exclusive left turns at intersections with traffic lights;
5. Installation of traffic lights or roundabouts at dangerous intersections.

Examples

1. Warning signs at dangerous locations and / or radar speed indicating sings

A low cost measure to point out a dangerous location can raise awareness of road users for the location they are approaching. When speeding at the intersection has proven to be (one of) the main causes of accidents placing a radar operated speed indicating sign can inform road users and influence their driving speed. Examples of these signs are given next.

Dangerous intersection

High accident zone reduce speed now

Both way's of signing or variants of these are commonly used all over the world. Study results show these measures have some positive effects, especially shortly after placement. After a while these measures have limited or no lasting effects on daily users.

2. Improving visibility of intersections by removing blocking objects and installing lighting

In many accidents visibility of the intersection itself or of other road users plays an important role in the cause of the accident. Improvement can be made by removing or relocating blocking objects (like trees or bushes but also commercial sings) and if located in the countryside also installing lighting system to give road users a better view. The example pictures on the next page are taken from a recent traffic safety project Witteveen+Bos has carried out in the Netherlands. The lighting and barrier were already placed at the site after a couple of serious accidents. Still accidents occurred caused by traffic related to the access road on the right side of the picture, mainly caused by the limited view from traffic coming out of the access road towards the main road.

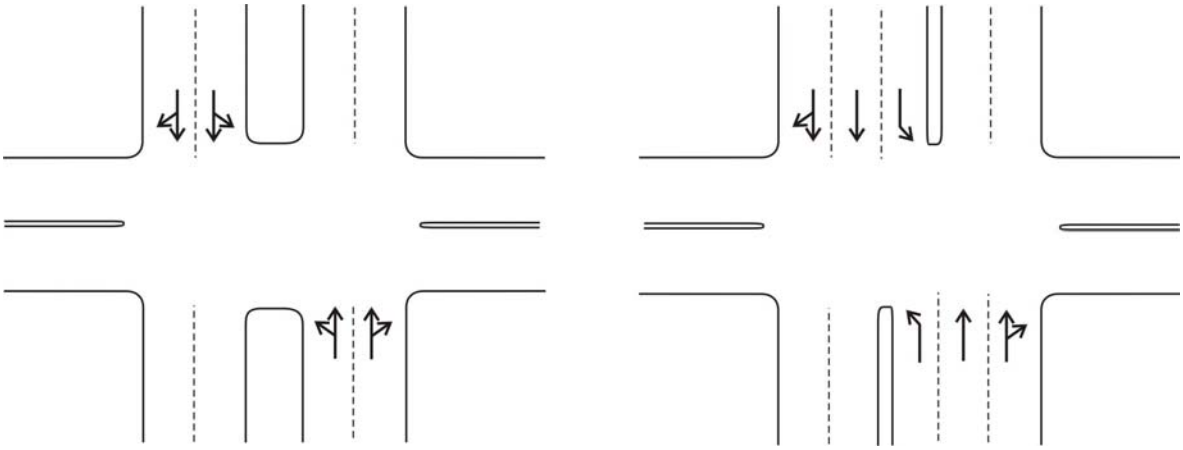
The red marked circles or ovals indicate elements which block the road user's view and have to be removed or replaced (the sign indicating a touristic attraction will be placed 50 m ahead of the intersection where it blocks no view).

3. Upgrade of pedestrian crossings with lighting and warning signs as intermediate step

The survey amongst Pieriga municipalities called pedestrian crossings at main roads a main concern in Pieriga traffic safety. For crossing a 2 by 2 lane main road, the only safe crossing is a split-level crossing (bridge or tunnel). Many main roads are still in a one lane per direction configuration. For this type of roads a progress can be made by turning the existing dangerous zebra-crossings into lighted zebra crossings with a warning system or controlled pedestrian crossing with traffic light controllers.

4. Adding exclusive left turns at intersections with traffic lights

Non-exclusive left turns cause delays in the traffic flow and are in many cases also responsible for blocking view at upcoming traffic in the other direction. The situation where two approaching vehicles both turn left is considered as the most dangerous situation, since it is not possible to see whether there are vehicles going straight ahead on the other lane travelling at a high speed. This situation is common in Riga, but is also found outside Riga.



Adding exclusive left turns will mean an extra phase in the traffic controller's signal plan, causing the cycle time to increase with a minimum of approximately 10 seconds. This means, the measure can only be implemented after traffic counts and capacity calculations proving it is possible to add exclusive left turns to the intersection for capacity's point of view.

5. Installation of traffic lights or roundabouts at dangerous intersections

Installation of traffic lights or a roundabout can be considered when the majority of accidents is caused by entering our leaving the main road in combination with relatively high volumes. Road type, traffic distribution (passenger cars, buses, freight traffic) and intensities are main items which influence the choice between roundabouts and traffic lights. Roundabouts are proven to be safer then traffic lights, but capacity is limited to intensities of about 20.000 - 30.000 passenger car units (pcu) per day in all directions together.

factsheet 08

adaptive traffic lights and monitoring

Description of the project

Implement vehicle detection to adapt green times to the actual amount of traffic. With the same detection monitoring can be started to improve traffic models.
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Refers to specific measures

RD18a.

Objectives of the project

Optimize traffic control, gaining extra capacity. Set-up a monitoring system to improve traffic modelling and research.

Dependencies

Adaptive traffic control benefits can only be realized if there is no extreme overload and the actual schedule is fit for it. So for example adaptive control can not solve the problems at K.Valdemara iela near the old town during peak hours. This is because of the extreme overload and because the actual schedule is only two phases with minimal time for the crossing phase. Then green adaption only can be green time extension at the main street which will worsen the waiting time for crossing traffic.

Design issues

There are diverse systems which can provide the detection of the presence of vehicles. Related to monitoring it is preferred to use systems which can at least count with acceptable **reliability**. First tests are already in progress with the counting systems on the bridges in Riga.
Already different kinds of systems have been tested in Riga. Because of diverse problems with each kind of system till now (infrared, inductive loop, video), no effective system to count vehicles in an accurate way has been found. This reflects the situation in other countries where inductive loops are still the most common detection system. Despite of the costs no other system has achieved a substantial market share.
Experiences with inductive loops in Latvia are not positive because these ask for a lot of maintenance and repair due to the different weather conditions all year round. Because of this it is recommended to use only systems with no or at least small in-street parts preferably without cables. Current developments show it is possible to detect vehicles with minor impact on road surfaces and more robustness than conventional inductive loops.

To be able to use detection it will be necessary to connect the detection systems to the controllers. It is probably possible to make adjustments in currently used controllers but that will be relatively expensive. In general it is more cost-effective to select controllers with built-in detection facilities and hardware for inclusion in a central control system. Because of this there two cost-effective ways to implement detection systems:

- *wait till controllers have to be replaced due to end of economic life cycle of technical malfunctioning;*
- *replace current controllers with new controllers fit for detections, old controllers can be used at new intersections (or renewed intersections) where there is less need for detection or can be used as a source of spare parts.*

*Examples of possible use of detection are given in the **third interim report**.*

Note: it is important to realize that investments like this ***alone*** will not solve the major traffic problems in and around Riga. The main goal should be to make ***better*** (some more capacity), ***more acceptable*** (no waiting for no reason) and ***safer*** (less accidents) controlled intersections.

Together with investments in detection at traffic lights a central control system can be implemented with monitoring capabilities. Input for this system is gained from the above-mentioned vehicle detection and additional strategic important locations (e.g. bridges and railway crossings). Additional to counting, measurements of travel times give information about the quality of traffic flow.
In the first project implementation program 2011-2017 the main focus lies on investments in new adaptive traffic controllers with vehicle detection systems and setting the basis for a central control system. Benefits of a central control system can be providing additional information to local controllers to switch green plans or green waves according to the expected traffic load. A central traffic control system also provides better information about the status of the network like earlier or later starts of rush hours, incidents or special situations which can be a reason to select a different control plan. Successful examples of such systems are SCOOT and Utopia/SPOT. Central control systems are rapidly developing. In the past these systems were sold as powerful solutions without the need for an expensive wide spread detection network. The current trend in central control systems however is they rely more and more on vehicle detection systems to organise traffic flows in a more accurate way.
The actual network without NTC is not fit for a network control system due to unequally spread traffic volumes. For extremely overloaded intersections it is more important to strongly keep control over the local situation than relying on the results of a network control system.

Measures included

1. PT priority at traffic lights
2. Upgrade of existing public transport stops

Stages (short, medium, long term)

Short term	design study, intersection capacity calculations and traffic light controller programming, tender procedure;
Medium term	after completion of the NTC there will be lesser traffic on both streets; as a result traffic light controllers probably need to be reprogrammed;
Long term	maintenance and further expanding of the system.

Side effects

Using adaptive traffic control gives opportunities for easy implementation of operational transport priority.

Cost category

Indication of costs per intersection for quick implementation:
EUR 15.000 - EUR 20.000 depending of the number of detectors and additional units. If combined with replacement of the controller additional costs can be kept lower, EUR 5.000 - 10.000 per intersection.

Investments in the first seven to ten years:

- setting up a international procurement procedure with assistance of a specialised consultant: EUR 125.000,--;
- implement vehicle detection for monitoring and adaptive control: EUR 15.000,-- - EUR 20.000,-- per intersection;
- implementation of a central control and monitoring system based on vehicle detection at traffic lights and additional travel time measurement: EUR 350.000,--;

Note: As the number of adaptive controlled intersections *increases* and the central control and monitoring system becomes *more useful*, the number of traffic engineers need to increase as well. Tasks of those engineers will be: preparing traffic control plans; traffic control maintenance (regular evaluations and parameter updates); storage and analyses of monitoring data. But also operator function at the central traffic management system.

Stakeholders involved

Riga City Council Traffic Department, Rigas Satiksme, Latvian State Roads.

Recommendations

As said before, since the experiences with some detection systems in Riga, the adequacy of detection systems in the Latvian climate is very important for the success. Therefore it is recommended to set up the procurement documents with an international traffic management expert to set the specifications for these systems in the procurement documents.

factsheet 09

PT - priority and facilities operational transport

Description of the project

Implementing selective detection at traffic lights makes it possible to reduce time lost for PT-vehicles and operational transport.

Refers to specific measures

RD18a, PT 27.

Objectives of the project

Achieving higher performance of PT with less differences in travel time and less vehicles necessary to operate a PT-line.
In combination with the use of free PT lanes operational transport can use the same selective detection to receive priority at an intersection. Regarding the existing situation in 2010, the main benefits for operational transport are gained with special PT-lanes. Selective detection can only supply additional gain of time and can not solve problems at overloaded intersections.

Dependencies

The largest improvements can be achieved at intersections which are not overloaded. Because at these intersections traffic control can be the most flexible and will give less delay to the other vehicles.

Design issues

There are diverse systems which can provide the selective detection of PT and operational transport vehicles. To be able to use selective detection it is necessary to connect detection systems to the controllers. It is possible to make adjustments in currently used controllers but that will be relatively expensive. In general it is more cost-effective to select controllers with built in detection facilities. For this reason there are two cost-effective ways to implement detection systems:

1. *wait till controllers have to be replaced due to end of economic life cycle of technical malfunctioning;*
2. *replace current controllers with new controllers fit for detections, old controllers can be used at new intersection (or renewed intersections) with less need for detection or can be used as a source of spare parts.*

*Examples of possible use of detection are given in the **third interim report**.*

Note that PT-priority will not be automatically absolute priority. Absolute priority, with high PT-frequencies, like on most lines in Riga, lead to too much hindrance for other vehicles. Economic gain is there in two ways:

- *need for less PT-vehicles to perform a schedule;*
- *improvement of reliability and travel speed of the public transport which will attract more passengers.*

Different techniques can be used to detect vehicles with priority. The basic requirement for the system is the ability to send vehicle information to the controller like direction, line number and vehicle identification. On a longer distance this can be done by sending the information to a receiver with infrared or short distance radio. Bluetooth or RFID tags can be used as alternative at a short distance. For checking in, the system needs to provide accurate position data of the vehicle with a small measurement error. Checking out can be used but is not necessary for the commonly used fixed time traffic control strategy in Riga. The location of checking in should be checking in at a distance of 150 - 200 metres before the stop line.

Using infrared or other longer distance communication systems has the advantage that there is, besides the controller, no extra system necessary at the roadside. But it will be necessary to know the exact location of a bus, in order to prevent checking in too early (with negative impact on intersection capacity). This can be realised by using GPS and/or odometers. This means extra costs inside the vehicle, actually depending on the quality of the positioning system of the current on-board computers.

With systems based on Bluetooth or RFID-tag it is possible to detect a vehicle at a check-in point where a roadside system is placed. Disadvantage of these systems are the roadside units which result in extra costs. Regarding this it is expected that with carefully formulated requirements also new companies can develop a robust system, as a system integrator of parts of proven technology.

Measures included

1. Adaptive traffic control;
2. Upgrade of existing public transport stops.

Stages (short, medium, long term)

Short term

Setting up an procurement procedure for implementation of PT-priority systems with assistance of an international specialised consultant;
after proven successful, further implementation of selective detection systems;

Medium/ Long term

Maintenance and further development

Side effects

- Using selective detection gives opportunities for easy implementation of operational transport priority;
- Numerous priority requests at an intersection can lead to blocking the normal traffic flow (at peak hours).

Cost category

Basic indication of costs of equipment (based on Dutch experience with short distance radio):

- *per intersection: EUR 5.000,--*
- *per vehicle: EUR 5.000,--*

Investments in the first implementation period 2011-2017:

- setting up a international procurement procedure with assistance of a specialised consultant: EUR 100.000,--;
- implementation of selective priority systems at approximately 100 intersections and 160 vehicles: EUR 1.500.000,-- (major PT lines)

Note: the investments in the first project implementation period are relatively high. This is due to the situation that actual standards for equipment (e.g. on-board computers with an automatic positioning system) will be more usual after this period. In the first period investments have to include (partial) update or purchase of systems to meet the actual standards.

Stakeholders involved

Riga City Council Traffic Department, Rigas Satiksme.

factsheet 10

improved public transport system for the municipalities of Pieriga - example Tukums

Description of the project

Improving of existing public transport system in municipalities of Pieriga region, what will make easier and more effective access to Riga by PT. Changing schedule and improving ticket services for PT are the main activities.

Objectives of the project

Create a public transport system in each municipality of Pieriga region in addition to the railway network and fast buses to Riga, what will provide easy, effective and attractive access to Riga by public transport and also getting back from Riga for employees and students.
Decrease the use of private cars, what causes decrease of CO2 emissions, congestion and other externalities.

Dependencies

Existing PT services and travel times in Tukums region are not attractive for local citizens who live in rural areas for travelling to Riga for work or studies. Meaning that many people find prices too high and time schedule of PT does not let them get till Riga before 8am or 9am. Also arriving from Riga after 5pm or 6pm (departure time from Riga) till rural areas by PT is not possible. Need to improved after research how many inhabitants actually need it.

Design issues

Tukums central bus and train station must become a transfer point with P+R facilities for traveling from rural areas and Tukums town to Riga city and back. Weakness of existing PT(bus and train) from Tukums till Riga and back is the travel time (from 1:10 till 1:30hours) and also the price of tickets (they are from 1.39Ls till 2.70Ls).

The table on next page shows that living in rural areas, working in Riga and traveling by PT is not possible. Existing public transport system is oriented to pupils and employees who work in Tukums and other citizens who are going to Tukums to get necessary services (hospitals, banks, state land services and others).

Table 01 - Existing availability of public transport in Tukums region for getting to and back from Riga

			Zentene	Sēme	Pūre	Jaunsāti	Irlava	Lestene	Džūkste	Slampe
Work time in Riga										
8.00-17.00	train leaves from Tukums 5.53,bus 6.15	first bus arrives in Tukums	7.47am	7.47am	6.30am	7.40am	7.27am, 7.41am	7.48am	7.19am, 7.26am	7.21am
	arrive in Tukums from Riga 18.48 by train, 19.05 by bus	last bus leaves from Tukums	17.30	17.30	23.45	17.20	18.38	17.20	17.30	19.25
9.00-18.00	train leaves from Tukums 6.33,bus 7.30	first bus arrives in Tukums	7.47am	7.47am	6.30am	7.40am	7.27am, 7.41am	7.48am	7.19am, 7.26am	7.21am
	arrive in Tukums from Riga 20.16 by train, 19.38 or 20.11 by bus	last bus leaves from Tukums	17.30	17.30	23.45	17.20	18.38	17.20	17.30	19.25
	price for PT during one month (21 working day)	by train	130,20Ls	98,70Ls	119,70Ls	142,80Ls	111,30Ls	119,70Ls	126,00Ls	108,15Ls
		by bus	144,90Ls	113,40Ls	100,80Ls	157,50Ls	126,00Ls	134,40Ls	140,70Ls	122,85Ls
	can or can not travel till and back from Riga for working or studies		**can not**	**can not**	**can**	**can not**	**can not**	**can not**	**can not**	**can if on morning uses car**

First step is to explore the demand for PT to and from the transfer points at stations with regional express train service (planned): what people could profit from shorter travel times when using this new bus-train connection?, Can this be integrated in existing bus lines by redirecting and connecting these lines on the trains in the station? If not what is the potential for new lines? And when there seems to be too few people for operating a bus line the use of private car or (in summer season) bike till transfer point Tukums central station is best solution (P&R).

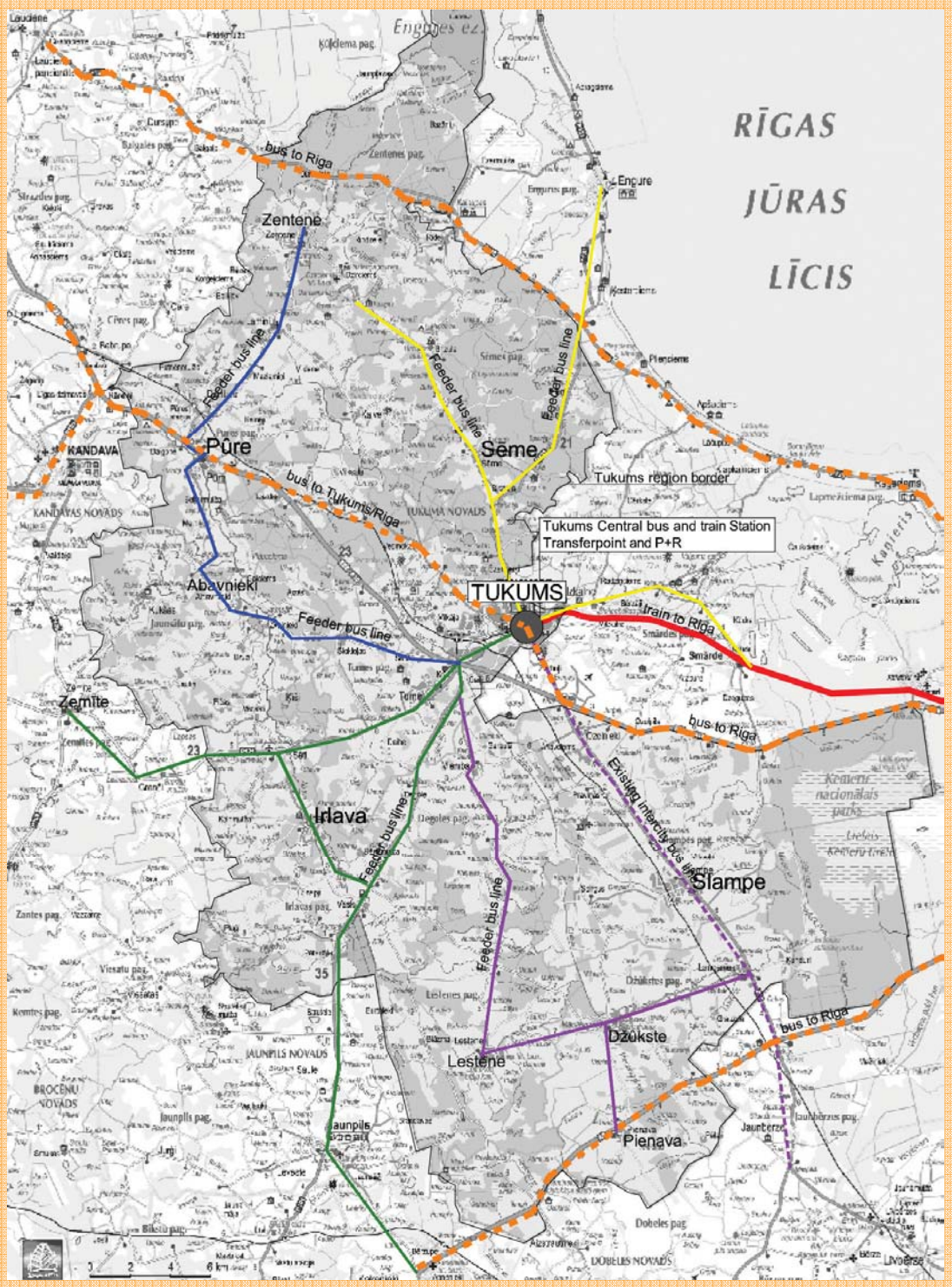
Second step is to create a fast regional express train (RE1). This will make it possible to shorten travel times to and from Riga significantly, already for existing passengers, but also to make it more attractive to others. In principle all stops of these RE1 train can be a new transfer point between bus, car and train. For Tukums travel time to and from Riga should be around 50-55minutes, the service should be at least operated in peak hours (arriving in Riga around 7.40am, 8:10 and 8:40) and in the evening (leaving from Riga around 17:00, 17:30, 18:00, 18.30), but better operated whole day as included in the train network as described in the RPMP. New services like WiFi, drinks or stands for bicycles could make the service even more attractive.

Third step is to create new lines that will provide availability by PT for working and studying in Riga. An idea of this network for the Tukums Region is shown in the ***map on next page***.

A precondition for success is that there is no need for people to buy several separate tickets. Therefore the ticketing systems must be transformed in an integrated ticketing system that makes it possible to use one ticket for: local/regional bus till Tukums, train or bus till Riga, PT in Riga. That will make traveling by PT easier and cheaper.

The demand for local PT should be evaluated on a regular basis, with the help of an audit and/or a short survey among users. Also, among the public, information and education about PT advantages and long term effects on environment should be provided.

Map of possible feeder bus lines for reaching Riga by PT.



Measures included

1. Survey about need for travelling to Riga by PT from rural areas;
2. Creation of new PT feeder bus lines, preferably based on adapted existing services;
3. Making shorter travel time from transfer point Tukums I bus and train station till Riga;
4. Implementing of new services on trains;
5. Changing ticketing.

Stages (short, medium, long term)

Short term survey about need for travelling to Riga by PT from rural areas, evaluation of PT schedules and available services, proposal of improvements;

Medium term creation of Regional Express train (RE1), creation and implementation of new feeder bus lines, changing ticketing, optimization of travel times, implementation of new services on PT;

Long term implementation of complete PT system in all municipalities of Pieriga region.

Side effects

More effectiveness of investments in train system, more revenues due to more passengers.
It will cause centralisation of economics of Latvia, meaning everybody will travel for work to Riga. But in existing situation is better than increase of unemployment.

Cost category

Survey – EUR 50 000,--
Detailing new feeder bus lines – EUR 10.000,-- per line
Improved train services and changing the ticketing system are already part of other projects in the RPMP.

Stakeholders involved

Regional municipalities, Public transport operators

Recommendations

Describe the areas that could profit from the reformed regional train system, offering more and faster train connections to and from Riga. Involve the consequences of the proposed closing of some stations in Pieriga in the survey for improved PT in rural area's in Pieriga.
Survey about the demand for PT (from rural areas till Riga and back) is the first thing to be done in all municipalities of Pieriga region.
Only on results of this survey any activities can be started for changing existing system.
Municipalities have to concentrate on P+R at their central stations if survey shows no demand for new PT lines for rural areas.

factsheet 11

railway stations

Description of the project

Upgrade railway stations focused on accessibility (Measure PT5).

Objectives of the project

1. Create a passenger-friendly and safe environment at train stations;
2. Improve the overall quality of stations;
3. Improve the accessibility of stations for elderly / disabled people;
4. Enable a shorter waiting time at stations and faster links with Riga;
5. Offer better accessibility of trains from higher platforms.

Dependencies

1. Purchase of new rolling stock, offering direct access from the platform without any steps;
2. Closure of stations not to be upgraded.

Design issues

1. Improving the overall quality of the stations makes it more attractive to use the train;
2. Accessible trains makes it attractive for new target groups to travel by train;
3. The trip time can be shortened because boarding time is shorter;
4. Some new elements are necessary, some are desirable.

Measures included

Lifted platforms, improved information signs, new shelters at platforms, clearly visible alignments, better illumination of platforms and access routes, barrier-free access routes, benches and seats at platforms and in shelters, ticket vending machines at all stations and staffed booths at larger stations (for tickets, snacks, newspapers, safety).

Examples of accessibility improvement measures.

Stages (short, medium, long term)

Short term define the necessary measures in detail;

Medium term upgrade of 50% of 43 smaller stations and 100% of 24 larger stations within 7 years;

Long term upgrading of 50% of 53 smaller stations.

Side effects

Although accessibility primarily is intended for disabled people, an important side-effect is a shorter travel time and safety improvement. because it is more difficult to step off the platform for illegal crossing of the track.

The upgrade of stations only is cost-effective for stations with enough passengers that can benefit from the upgrade. Therefore, the upgrade of stations with less than 30.000 passengers per year is not included in the investments costs of the RPMP. It is recommended to close these stations in the next 7 years and to offer a bus alternative to the next station when not yet available. The benefits of the closure of these stations are:

1. *Less investments needed for upgrade of stations;*
2. *Higher travel speed for all other passengers;*
3. *More competitive travel times of train with (private) bus and minibus operators.*

Based on data on the amount of passengers per year in the DE-Consult study the stations in the table below can be considered to be closed. Travel demand for these stations should be studied on the short term and afterwards decisions on closures can be made.

Line	Stations with too few passengers for cost effective use			nr of stations
Tukums - Riga	*Priedane, Jaundubulti, Pumpuri, Kudra, Smarde, Milzkalne, Tukums2*			**7**
Skulte - Riga	*Incupe, Vecdaugava, Garupe*			**3**
Aizkraukle – Riga	*Muldakmens, Drendarijs, Kaibala, Darzini, Rumbula*			**5**
Jelgava - Riga	*Cena, Dalbe*			**2**
Sigulda - Riga	*Silciems, Vangazi, Krievupe, Baltezers*			**4**
Total nr of stations to be considered for closure				**21**
Number of stations to be upgraded				**67**
Smaller stations	*< 500.000 /year*	*platform*	*120 m*	**43**
Busier stations	*> 500.000 year*	*platform*	*120 m*	**24**

Cost category

EUR 21,5 mln for 43 small stations, EUR 24 mln for 24 larger stations, EUR 15 mln for basic upgrade of Riga central station.

Stakeholders involved

PV, LDZ, city/municipal councils in Pieriga and in Riga.

Recommendations

Clear communication in project progress. List the upgraded stations that have a good accessibility to disabled people in the time table.

factsheet 12

the central station area

Description of the project

Redesign of tramway layout in front of the Central Station.

Refers to specific measures

PT17

Dependencies

Creation of transversal tramlines (no ending tramlines at Stacijas Laukums and Central Tirgus).

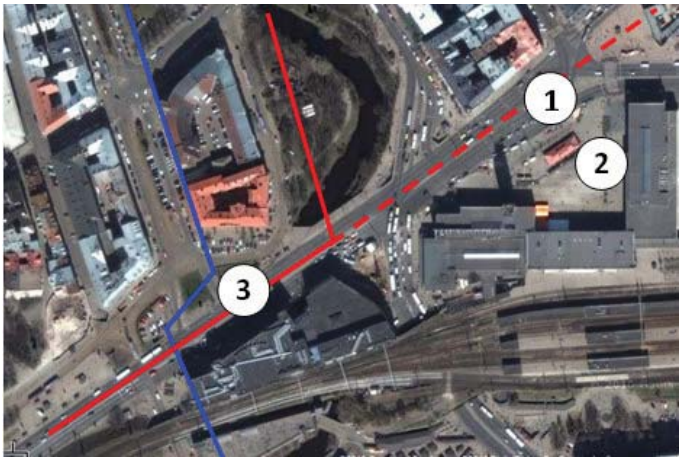
Objectives of the project

1. improve connection between tram, bus and train;
2. minimize distance between the train station and the tramway stops;
3. centralize stops of all tramlines at one easy to recognize location;
4. safe and easy pedestrian crossings between train station and tramway stops;
5. tramway platforms giving easy access to the new low floor trams;
6. acceptable (low) impact on traffic flows;
7. possible to realize within 5 years with acceptable costs.

Design issues

Three possible variants have been explored for the RPMP:

1. *stops in Marijas iela next to station*
2. *stops on station square*
3. *stops next to Stockmann*



Near to the Central Station tramlines in east-west (red in figure) and north south direction (blue in figure) come close to each other. In the philosophy of creating a transversal Public Transport system and given the forecasted demand for intermodal shifts from train to tram and vice versa, the creation of a tram to tram connection is of more importance then a tram to train connection. This is why location number 3 is preferred in comparison to the locations number **1** and **2**. Besides this, the locations number **1** and **2** will have a large impact on traffic flows and need much more infrastructural works both for roads and tramway. This means that realization costs will be very high and will provide a solution only in medium or even long term, while the need for a tram stop near the central station is already there in the short term.

Variant **3** lies on a larger, but still acceptable distance from the station. It creates a visible stop of all tramway lines at one very recognizable place situated between station and bus station (Autoosta), near Stockmann and Central tirgus and between the old city centre (Vecriga) and the train station. It is also easy to realize because it offers a maximum use of existing tram tracks. Only a relatively small reconstruction of the tracks, building of new, 70m. long tramway stops and redevelopment of a small parking lot is necessary. It is therefore recommended to redevelop this area to a tram stop as shown in the figure on the next page. Depending on the chosen track layout it would even still be possible to end tramway lines 6 and 11 here when desirable and to create a turning facility.

The new tramway stops are located at the entrance of the old city and should be preferably created as a well visible and recognizable tramway stop. An architectural designed tramway stop combined with an attractive design of the area around the tramway stop supporting the concept is advised. Good examples of this can be found in France (Strassburg, Homme de Fer, see photo) or in Munich (Munchner Freiheit).

Measures included

1. Improved visibility and image of central tramway stop;
2. Improved transfer between tramway lines;
3. Upgrade of tram shelter facilities and high ramps;
4. PT Priority at traffic lights.

Stages (short, medium, long term)

Short term detailed design and planning of infrastructure, architect design of central tramway stop, transport planning on rerouting tramway lines, realization of new stops. Compensating measures for lost parking places;

Medium term improved pedestrian tunnel under Marijas iela and 13.janvara iela, Priority at traffic lights.

Long term -

Side effects

1. Existing parking places need to be relocated elsewhere;
2. Increase of amount of passengers in the pedestrian tunnels underneath the 13 Janvara iela which might demand for an increase of capacity;
3. Connection Aspazijas bulvaris and 13 Janvara iela might be closed in order to create space for tramway stop. This has to be further studied in the design study.

Cost category

Medium.

Stakeholders involved

Riga City Council: City Development, Department and Traffic Department,
Rigas Satiksme,
Latvijas Dzelzcels and Passazieru Vilciens.

Recommendations

Design study for tramway stop;
Design study on pedestrian tunnel improvements;
Capacity study Aspazijas bulvaris and 13 Janvara iela.

factsheet 13

Park and Ride in Pieriga

Description of the project

Create ***parking areas*** beside existing regional public transport stations, and **increase** use of region ***public transport*** for daily trips to Riga.

Locations for short term implementation are Saulkrasti, Lielvarde, Sigulda, Ogre, Aizkraukle, Iecava and Tukums. For the longer term the following locations are nominated: Ādažu, Mārupes, Ķekavas , Carnikava, Lielvārdes, Mālpils, Krimuldas, Kokneses, Ikšķiles, Stopiņu, Skrīveru, Olaines, Ādažu, Baldones, Sējas, Limbažu ,Saulkrastu, Inčukalna, Līgatnes, Ropažu, Garkalnes, Ķeguma, Salaspils , Vecumnieku, Ozolnieku, Babītes, Engures regions, Jelgavas region and city, Jūrmala city.

Refers to specific measures

None.

Dependencies

Existing PT services and travel times are not attractive for Pieriga region citizens. This project is strongly connected with developing attractive PT system in Riga and Pieriga region.

Objectives of the project

Increase the attractiveness and ease of use of public transport and non-motorised forms of transport, so that they provide a genuine alternative to the use of the private car.

Decrease use of private cars, what causes decrease of CO2 emissions, congestion and other externalities.

Design issues

Create safe parking for cars and bicycles at the PT central stations of regions and develop attractive PT system (attractive by travel time, ticket prices and available services) in Riga and Pieriga region. For example by buying a ticket for regional transport at the P+R location you also get a free ticket for public transport in Riga, so that everybody can reach his destination by one ticket.

First step is to enlarge existing car and bicycle parking areas owned by municipalities beside public transport stations, where it is necessary already (see

locations for short term implementation). Second step is to select locations based on high frequencies of buses and trains and the attractiveness of the station area. At these locations P+R pilots can be established. If the pilot locations show good results after one year (more passengers on PT and full parking at stations), the locations can be upgraded and more locations can be selected.
When turning a pilot location into a definite **P+R** location, the following design issues should be addressed:

control. For feeling secure about leaving the car and avoiding encountering people hanging around, there needs to be some sort of control. If there are no buildings in the area, one can
think of camera's or an administrator;
lighting. This is of great importance for the feeling of safety and security. Use preferably white
lights and avoid dark sections;
clarity and comfort of the route to and from the station. Make use of low greenery and avoid masking effects. The route should be as short as possible (max 250 meter from station),
clarity and comfort of the route to and from the parking lot. Within 5 km the route should be signposted;
avoiding dangerous crossings, with proper pavement and without big height differences;
separating the area from the public domain outside. This gives the area more status and makes it harder for outsiders to cross the area. Make use of fences or low greenery, and mark refuge routes;
adequate routing to empty parking places;
concern. provide for several large spaces, for handicapped and persons with prams etcetera. Parking in 45 degrees is preferable;
maintenance. proper maintenance of the area (pavement, greenery, lighting, dustbins, advertisements
etcetera);
activities around the area. This will enhance the safety feeling in dark hours and makes waiting less annoying;
information. existence of (dynamic) travel information on the area;
partitioning in the case of large areas. This will ease the orientation;
security. campaign on the area for theft prevention;
cyclists. proper parking for bicycles, e.g. by installing bicycle lockers, close to the station.

The areas should be evaluated on a regular basis, with the help of an audit and/or a short survey among users. Also, among the public, information and education about P+R advantages and long term effects on environment should be provided.

Measures included

1. Building of parking places and decorating the area.
2. Changing PT schedules and available services.
3. Public educating.

Stages (short, medium, long term)

Short term enlarging informal P+R locations, design studies, evaluation of PT schedules and available services, public educating.

Medium term construction works , evaluating PT schedules and implementation of new services.

Long term implementation of P&R systems at all regional centres with substantial commuter flows to Riga.

Side effects

More cars in regional centres, less cars on main (A) roads and Riga city.
Change of PT schedule.

Cost category

Per P&R parking area for 20 cars and 20 bicycles (design, construction)~500m2: EUR 25.850,-- (open air parking) and EUR 105.420,-- (covered parking area)
Public information about P&R advantages in every municipality (commercials, brochures, billboards, lectures in schools) EUR 10.000,-

Stakeholders involved

Regional municipalities, Public transport operators

Recommendations

More detailed research should be done in each municipality:

- *about the size of parking area for Park and Ride;*
- *evaluation of most popular travel times for Park and Ride users.*

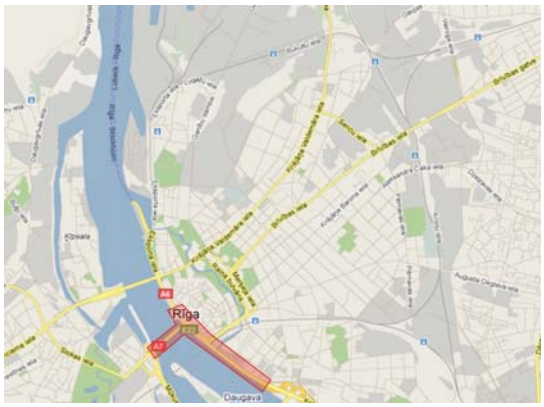
It is proposed to start with Park and Ride at a few locations and expand the network of Park and Ride locations gradually, when these primary locations turn out to be successful.

factsheet 14

Akmens bridge and 11. novembra krastmala

Description of the project

Downgrading the Akmens bridge and 11. novembra krastmala for car/truck traffic.



Refers to specific measures

RD7m

Dependencies

RD4m

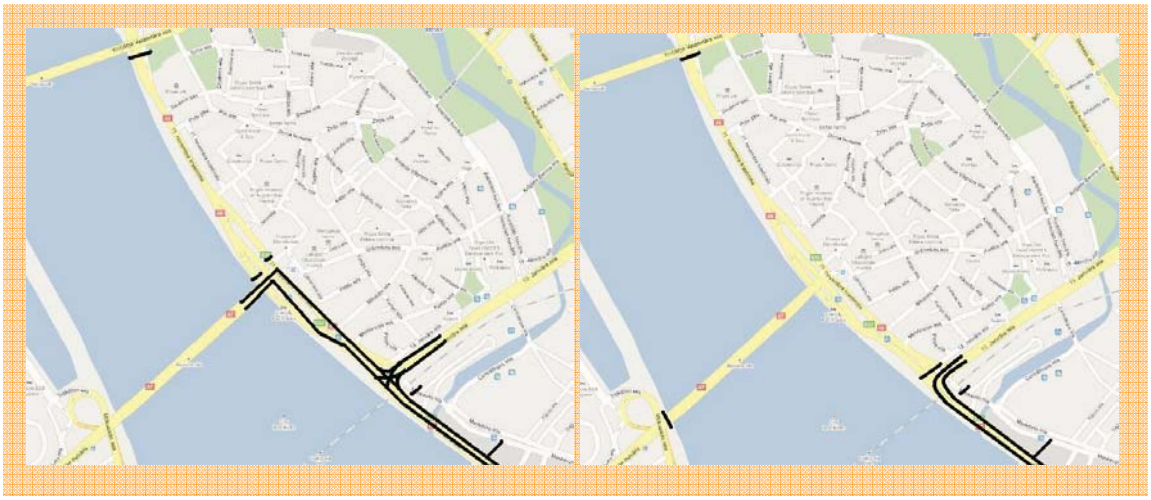
Objectives of the project

To improve the liveability situation in the centre, make NMT and PT more competitive, improve the traffic flow and enhance the options for new development on the east bank. Akmens bridge will become an important NMT link between the left bank (University) and the city centre.

Design issues

Depending on the extent of downgrading, there are several design options. In the case of limiting car traffic on the bridge together with a closure of 11. novembra krastmala (the northern part) a proper connection can be made between Akmens brdige and 13. Janvara iela. The junction krastmala - 13. Janvara iela can be reconstructed to make all directions possible in a direct way, controlled with traffic lights. This is possible when car traffic from Akmens bridge is limited and the access road of the market is closed. A new access road for the market can be built to the south of the junction, connecting with Krasta iela. This situation is depicted in the left panel of the Figure below.

The right panel depicts the situation that Akmens bridge is a dedicated bridge for PT and NMT only. This situation is only possible if a NTC river crossing is existing. It is now logical to also close krastmala and the junction becomes a bend in the route Krasta iela - 13. Janvara iela. Also in this situation the access road for the market is relocated. The situation can therefore be regarded as the final situation for the area.



Measures included

Optimisation of traffic lights, cycle lanes.

Stages (short, medium, long term)

Short term pilot with closure Akmens bridge for car/trucks;

Medium term downgrading Akmens bridge and closing 11. novembra krastmala;

Long term reconstruction Akmens bridge and junction krastmala - 13 Janvara iela.

Side effects

Without a NTC crossing there will be more pressure on the other bridges and routes.

Cost category

EUR 300.000 ex. VAT for the short term

Stakeholders involved

Riga City Council Traffic Department, Rigas Satiksme.

Recommendations

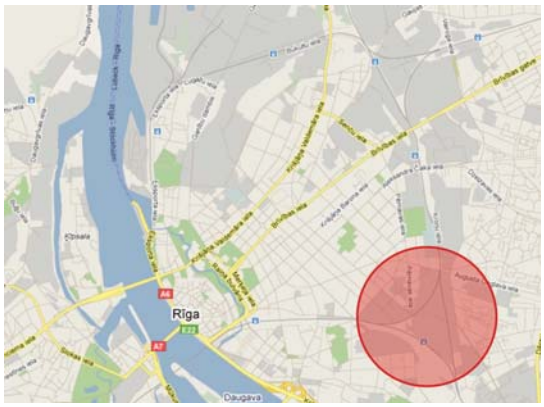
Piloting with closure of Akmens bridge in weekends.

factsheet 15

eastern connection city ring - city centre ring

Description of the project

Connecting the city ring with the city centre ring in the area around Valmieras iela.



Refers to specific measures

RD6m

Dependencies

RD17a, RD18a

Objectives of the project

To improve the functioning of the road hierarchy, diverting through traffic from destination traffic, connections need to be established between the Eastern magistral (part of the city ring) and the city centre ring. This will improve the usage of the rings according to their function.

Design issues

The current plan by RCC is to build a grade-separated interchange at A. Deglava iela. the left panel of the Figure below depicts this situation. Due to limited space between the connection and the railway bridge a cloverleaf solution is proposed. Though this is a relatively cheap solution, the pressure on A. Deglava iela and the A. Deglava iela - Pernavas iela triangle will increase, leading to congestion on the city centre ring. An alternative solution is depicted in the right panel of the Figure below. Here the grade-separated interchange is built on the connection with Vietalvas iela. In order to make a high level-of-service connection with the city centre ring the road will cross rail via two bridges, leading to a new junction, as part of the outplacement the city centre ring. The advantage of this option lies in the relation with the downgrading of Valmieras iela (Bs6). On the other hand, the solution is more expensive.

Measures included

Cycle lanes in case of connection via Vietalvas iela.

Stages (short, medium, long term)

Short term feasibility study;

Medium term construction of the interchange.

Long term -

Side effects

The pressure on the city ring and A. Deglava iela might increase.

Cost category

EUR 7.500.000 ex. VAT for construction of an interchange at A. Deglava iela.

Stakeholders involved

Riga City Council Traffic Department, Rigas Satiksme.

Recommendations

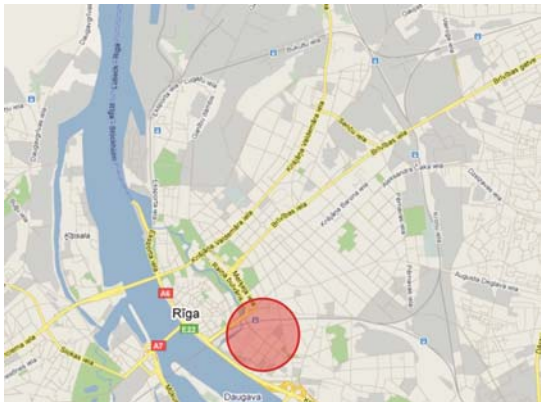
-

factsheet 16

reconstruction of public transport stops in Gogola iela

Description of the project

Reorganization and reconstruction of the bus stops on Gogola iela near station and central market. Through creation of transversal trolleybus lines the terminal in Gaizina iela can be reconstructed for other ending bus lines and minibuses. Minibuses should not stop at the stops along Gogola iela, but end in Gaizina iela or on the minibus station at Satekles iela. Redirecting the through car traffic to Dzirnavu iela and Turgeneva and Krasta iela will help making the area much more attractive for waiting passengers and less congested, but is not absolutely necessary. This also makes it possible to make another arrangement of the stops in Gogola iela.



Objectives of the project

Increase the safety, comfort and access of the bus stops for bus and minibuses in Gogola iela. Shorten stopping times and increase travel speed of public transport on Gogola iela between Turgeneva iela and 13. Janvara iela.

Dependencies

The reform of the minibus network and (trolley)bus network, focussed on increasing the electrified network and reducing the number of buses in the city centre will strongly influence the number buses stopping on these stops and the possibility to create stops in Gaizina iela.

Design issues

Create enough bus stops. **t**he number of stops has to be enough to accommodate all buses without any delay;
lighting. This is of great importance for the feeling of safety and security. Use preferably lower white lights and avoid dark sections;
clarity and comfort Stops should be easy to find for passengers and easy to reach both from the station and the market halls;
avoiding dangerous crossings, still a lot of buses are driving though: the underpass can still be useful, but also a level crossing in two parts can be considered;
create a public domain that is nice to stay gives the area more status and makes it pleasant to use for passengers and pedestrian between market hall and station;
routing Parking east of railway has still to be accessible;
maintenance. proper maintenance of the area (pavement, garbage, lighting, dustbins,

advertisements, outdoor furniture, shelters);
information. existence of (dynamic) travel information on the way out of the station and on the stops;
security. Assure the safety of passengers using these stops;
cyclists. proper parking for bicycles, e.g. by installing bicycle lockers, close to the station.

Stages (short, medium, long term)

Short term

Study on the effects of closing Gogola iela between Turgeneva iela and 13. Janvara iela for car traffic. Create transversal trolleybus lines. Redirect minibus lines. Determine the number of buses in the near future, according to the RPMP network measures. Design study on the stops and other design elements.

Medium term

Decision on closing Gogola iela for through traffic, construction works on new stops, including passenger information and displays, implement the new traffic routes.

Side effects

Better public space near the station, less environmental impact of cars, buses and minibuses on this place. Less traffic on crossing of Gogola iela with 13. Janvara iela. Possibilities of making more level crossings for pedestrians.

Cost category

Medium.

Stakeholders involved

Riga City Council, Public transport operators (RS, Minibus, Regional), Market Hall, Parking operator

Recommendations

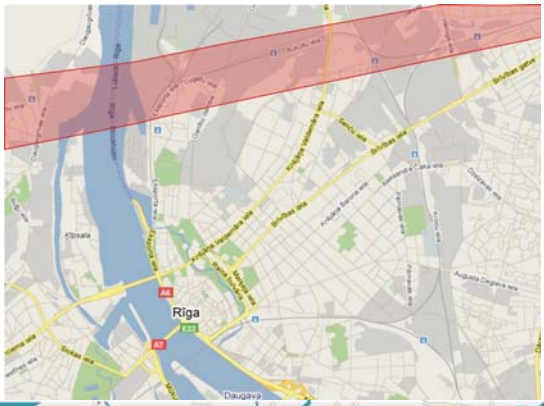
Start with better passenger information on these stops, even before the reconstruction.
Create transfer points for buses outside the city centre to reduce the number of buses.
Keep the Parking near the market halls accessible to create acceptance for this measure.

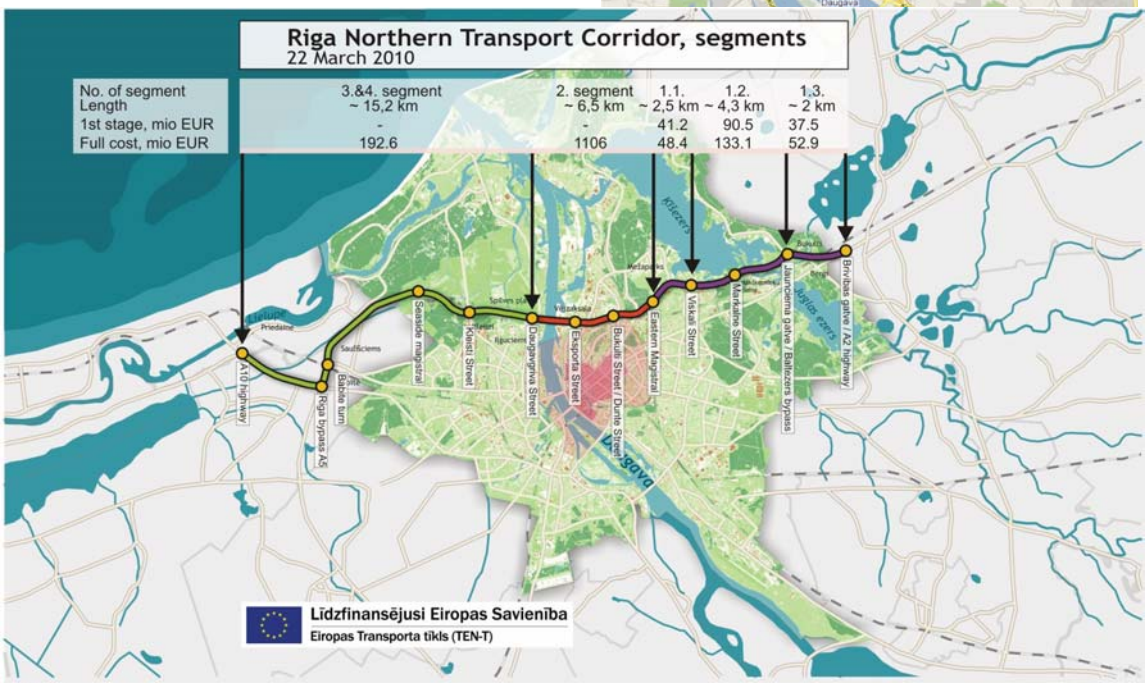
factsheet 17

development Northern Transport Corridor

Description of the project

Development of the Northern Transport Corridor between the A5 at Babite and the A2 at Bergi. The whole corridor consists of 4 segments., with segment 2 being by far the most expensive one. The design, necessary costs and phasing are subject of a RCC study.





Important:
a) costs of segment 1.2. include full solution with multi-level intersections in both ends. Respectively - costs of 1.1. and 1.3. do not include these junctions.
b) costs given in mio EUR, without VAT
c) for 2nd segment taken option 3 (tunnel/ high bridge)
d) for 3rd_4th segments taken option 2a from the report from 12th March 2010, full costs of option without land purchase and VAT

Refers to specific measures

RD4m.

Dependencies

RD7m, RD8m.

Objectives of the project

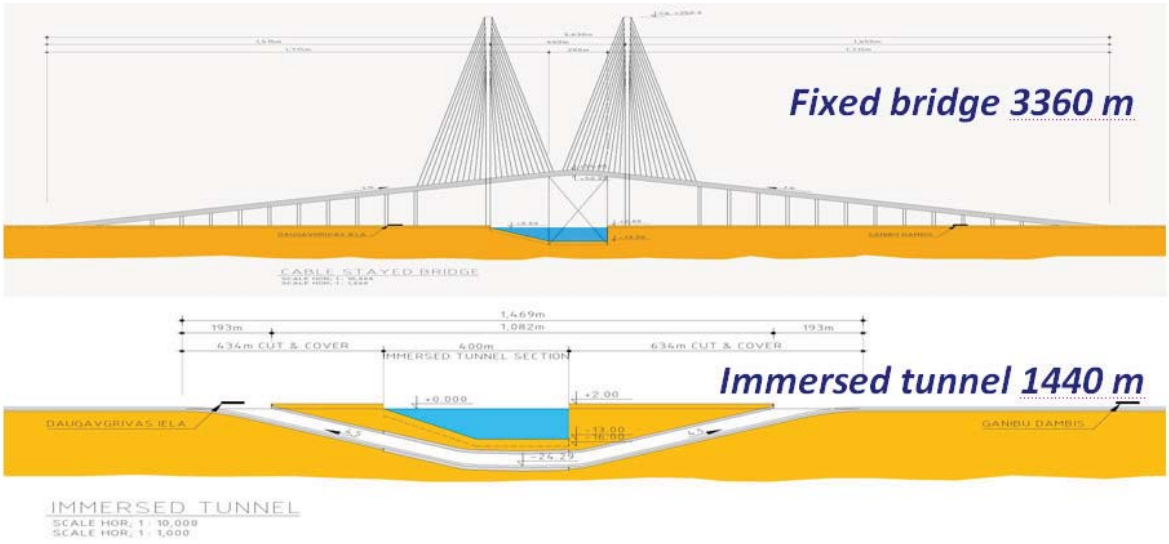
The Northern Transport Corridor is supposed to increase Riga and Pieriga accessibility, provide an adequate route for transit traffic, connect the port areas to the main network, solve liveability issues on the eastbank and structure further urban development of Riga.

Design issues

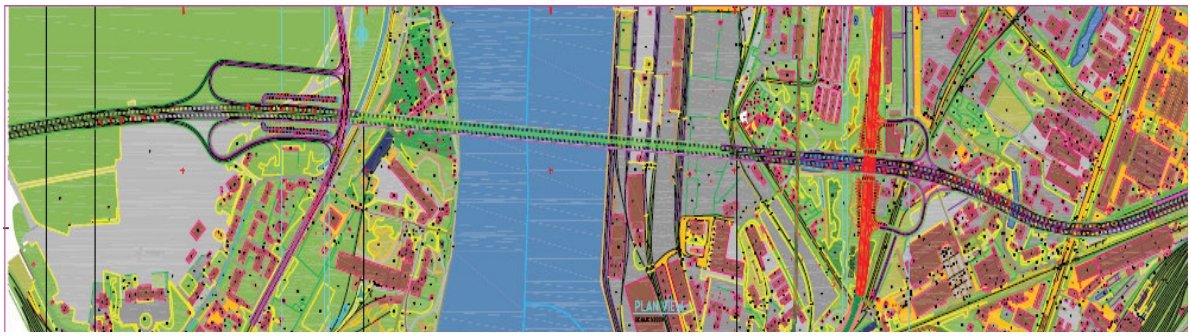
In the design process many choices have to be made. There is an ongoing study to determine where the design can be simplified to reduce on construction costs. This section focuses on segment 2, since this segment is by far the most expensive. Expensive elements are a tunnel underneath the graveyard Garnizona kapi and the crossing of the Daugava.

In principle it is possible to simplify the design between the river and the interchange with the Eastern magistral. Instead of a tunnel underneath the graveyard it is possible to stay at the south of this graveyard, using Gaujas iela and the height of the railway crossing at Brasa to construct a fly-over over the railway line Riga-Saulkrasti. Further west the fly-over can connect with Bukultu iela on ground level. The exchange with Duntes iela can be made with a big, traffic controlled roundabout. The next junction to the west is the connection with Ganibu dambis. In the original design there is no connection with this road, but with an extended Eksporta iela instead. It is an option to skip the connection with an extended Eksporta iela and to connect with Ganibu dambis on ground level, also with the construction of a roundabout or junction with traffic lights. In this option the so-called Kundzinsala link will not connect to the NTC and is therefore not feasible to construct. One can argue whether the NTC will remain its attractiveness if the design is simplified with junctions on ground level and curves in the horizontal alignment. In our opinion the NTC will still be attractive, because routes south suffer from bigger problems. The attractiveness is also related to the attractiveness of the eastern magistral. The latter route should act as a main feeder for the NTC.

For the river crossing two basic options are available: a high bridge and a tunnel. A bridge has the advantage of offering a solution to cross the railways at Eksportosta in a straight line, as an extension of Bukultu iela. The flyovers can be part of the on-ramp of the bridge. Another advantage is that all dangerous goods vehicles can use the bridge (although dangerous goods transport is currently quite marginal and can be transported by rail). The tunnel involves substantially lower investment costs, less loss of port area, is not vulnerable to weather conditions and environmental friendly with respect to noise and exhaust emission. The bridge option can be cheaper if it does not need to be a high bridge to overpass cruise ships. However, outplacement of the cruise ship terminal will be a loss for the city centre and needs closer consideration.



In the case of a tunnel, the best route will start just to the south of Maza Vejzaksala. The connections on both sides can be made with a half cloverleaf interchange.



Measures included

1. River crossing;
2. Connections with main road network;
3. Mitigating measures like noise barriers.

Stages (short, medium, long term)

Short term — Further investigation in design issues and the costs involved, completion of segment 1;

Medium term — Completion of segment 2 , 3 and 4;

Long term — Further optimisation.

Side effects

Loss of port area, liveability issues, degradation of country side.

Cost category

See the costs calculations in the first figure.

Stakeholders involved

Riga City Council, Civil organisations.

Recommendations

Further research on possible cost reductions, while maintaining a high level of service.

factsheet 18

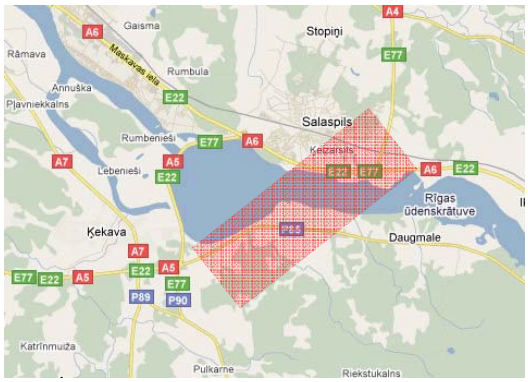
Transport value of a new A4/A5 connection

Description of the project

This fact sheet contains results of analyses that have been conducted to assess the demand value of a new A4/A5 connection and the importance of this connection for the transport network. This has been done by relating the demand to the other river crossings.

The conclusion is that a new A4/A5 connection does not contribute a great deal to enlightening the traffic loads on the other crossings (e.g. Vansu and Salu). This is as expected, since the majority of the trips crossing the river has origins and destinations located to the north of the connection. It can therefore also not play a role as a substitute for a new northern crossing. Following this conclusion, the new A4/A5 connection has not been included in the strategy for the coming 15 years.

For the longer term, however, a bypass for the A4/A5 dam might become quite desirable. Firstly, it would make it possible to reduce traffic on the dam, safeguarding the construction and limiting repair works. Secondly, it seems to have its own value in the traffic system, regardless the implementation of a new northern crossing



e.g. NTC or Hanzas). A new connection facilitates long distance west-east as well as north-south directed traffic (and vice versa), giving Pieriga and the areas further away better accessibility. It would also have future value for the TEN network and international traffic (Via Baltica), being able to accommodate fast growth in cars and truck traffic. Thirdly, regardless of the desirability of spatial developments in the vicinity of the A4 and the A5, the new connection can play an important role in facilitating new vehicle trips in Pieriga. For the reasons above a new southern river crossing has been adopted in the long term strategy.

Refers to specific measures

RD28l.

Objectives of the project

The objective of the analyses was to assess the importance of a new A4/A5 connection from a transport perspective.

Dependencies

RD21s, RD24m, RD27l.

Results

In table 1 the results of a set of model tests are summarized. Per test scenario the traffic volumes on the river crossings are presented as percentages of the total volume crossing the river in the morning peak. The first part of the table is related to car volumes, the second to truck volumes. In the test scenarios the influence of construction of a NTC crossing and a new A4/A5 connection is studied. It should be noted that scenario 1 and 2 are based upon the traffic volumes of the Reference scenario, while scenario 3 and 4 are based upon the traffic volumes of Variant 1 (which includes the Northern Transport Corridor).

Table 1 (first scenario) shows that a new A4/A5 connection will not attract a large amount of cars. Out of a total of 20.000 cars per hour around 1.200 cars (6 %) will use the new connection. By comparing scenario 2 with 1 it can be seen that a new A4-A5 connection leads to less cars on the Dam. It appears to have a little effect on the traffic volume on Vansu bridge and the Salu bridge.

In the case of an added NTC crossing a new A4-A5 connection will facilitate about 600 cars per hour (3 %), see scenario 3. Apparently, there is no strong relation, either directly or indirectly, between the NTC crossing and the new A4/A5 connection. In scenario 4 a closure of the Southern bridge has been modelled to see what the maximum usage of the new connection would be in the case of an incident on the Southern bridge. As can be seen in the table, with 1000 cars per hour (4 %) the usage of the A4/A5 connection is still moderate.

As for trucks, a new A4-A5 connection seems to attract some vehicles (5 %) from the Dam, the Southern bridge and the Salu bridge. With the addition of a NTC crossing (scenario 3) the importance of the new A4/A5 connection drops. This can be explained by long distance trucks taking their preferable route again. Closure of the Southern bridge, i.e. in the case of a major incident, would lead to a small rise in trucks on the A4/A5 connection as well as the dam (scenario 4 vs. 3).

table 1. Contribution of the river crossings to the total volume crossing the Daugava river in Pieriga in the morning peak 2020 (Akmens bridge has been downgraded in the scenario's 3 and 4)

	NTC cros-sing	Vansu	Akmens	Salu	Southern	Dam	A4/A5
For cars:							
1. Without NTC, without A4/A5 connection	0%	23%	18%	33%	20%	5%	0%
2. Without NTC, with A4/A5 connection	0%	22%	18%	32%	20%	2%	6%
3. With NTC, with A4/A5 connection	31%	15%	7%	27%	17%	1%	3%
4. Sub: No Southern bridge available	34%	17%	7%	36%	0%	2%	4%
For trucks:							
1. Without NTC, without A4/A5 connection	0%	0%	19%	39%	35%	7%	0%
2. Without NTC, with A4/A5 connection	0%	0%	19%	38%	33%	5%	5%
3. With NTC, with A4/A5 connection	24%	0%	5%	34%	32%	2%	3%
4. Sub: No Southern bridge available	27%	0%	6%	54%	0%	7%	6%

Stakeholders involved	Recommendations
Latvian State Roads.	Monitoring of the situation.

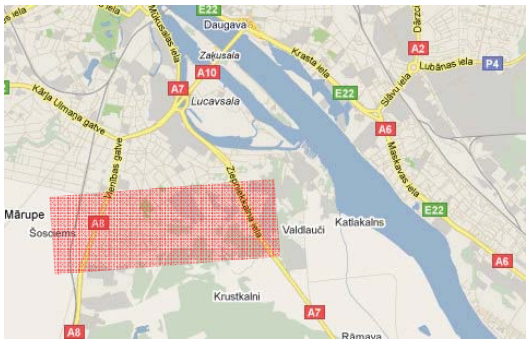
factsheet 19

Transport value of a new A7/A8 connection

Description of the project

This fact sheet contains results of analyses that have been conducted to assess the demand value of a new A7/A8 connection and the importance of this connection for the transport network. A new A7/A8 connection can form an extension of the route via the Southern bridge.

The conclusion is that the A7/A8 connection complements to the Southern Bridge, but not sufficiently. The infrastructure is not used up to its maximum, and the traffic volumes on the route Vienibas gatve - Salu/Akmens bridge are not reduced. For this reason the project has not been included in the RPMP program. However,



there can be other reasons for making the connection, like getting rid of rat run traffic through Ziepniekkalns. For this reason, a feasibility study has been included in the RPMP program.

Refers to specific measures

RD14l

Objectives of the project

The objective of the analyses was to assess the importance of a new A7/A8 connection from a transport perspective.

Dependencies

RD4m, RD28l

Results

The analysis has been based upon the reference scenario 2020. In this scenario the connection was added. The characteristics of this link are similar to the route to the Southern bridge (70 km/h, 3 lanes both directions). As can be seen in figure I, the absolute volume on the A7/A8 connection is limited. The number of vehicles in the morning peak is 350 from west to east and 650 from east to west. Given the total capacity (6000 vehicles per direction), the volumes are small. The figures do not rise if the connection is established in a more horizontal way.

The connection serves mainly for long distance traffic over the Southern bridge, as can be seen in figure II, which presents a selected link analysis of the A7/A8 connection. Traffic to and from Olaine as well as to and from Northwest Riga use this connection. The relation with Northwest Riga shows that the route via the A5 is more favourable than a route via Riga. On the east bank the figure shows that the eastern

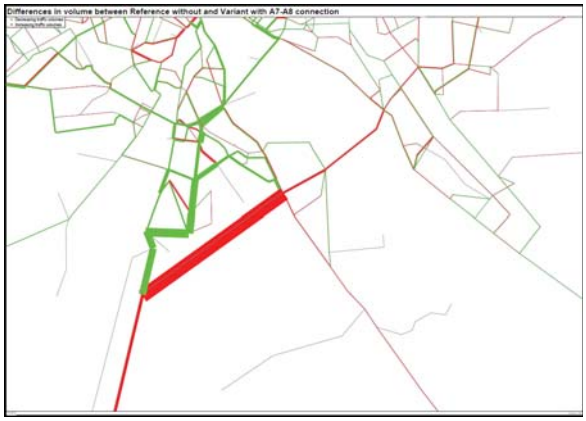
arterial as well as the ring road to Jugla are important routes for further travelling, as is in line with the desired situation.

The differences between the variant with the connection and the reference situation (in absolute terms) is shown in figure III. As can be seen the traffic volumes on the infrastructure north of the A7/A8 connection diminishes, while south and east of the connection an increase can be seen. The traffic between Southern bridge and the A8 was taking a route through Ziepniekkalns, but is now using the A7/A8 connection. The limited increase on the Southern bridge is related to rerouting. Apart from the new connection, the differences are relatively small.

Figure I. Relative volumes on the A7-A8 connection and surrounding routes

Figure II. Selected link analysis traffic on A7-A8 connection

Figure III. Volume differences between variant with A7-A8 connection and reference situation (red = increase, green = decrease)



Stakeholders involved	Recommendations
Riga City Council, Latvian State Roads	A feasibility study on the short term.

factsheet 20

Road transport over the network

Description of the project

This fact sheet contains results of analyses that have been conducted to examine the function of road network sections with regard to freight transport.

The conclusion is that almost all traffic on the roads in Riga has its origin or destination in Riga. Therefore, redirecting transit traffic will not solve the problems on the infrastructure in Riga. However, the results show that there is room for redirecting internal tangential traffic away from the central bridges.

Refers to specific measures

-

Objectives of the project

The objective of the analyses was to examine the usage of the roads by freight traffic.

Dependencies

-

Results

Figures I and II provide an overview of truck volumes in the morning peak by type of relation. The reference situation 2025 is depicted. The different colours show the type of relation:

- traffic within CBD (Central Business District, more or less the area within the railway loop on the eastbank, with the river as western border) or the rest of Riga (grey), which can be regarded as internal tangential traffic;
- traffic between CBD and the rest of Riga (yellow), which can be regarded as internal radial traffic;
- traffic between CBD and the rest of Latvia (orange), regarded as external radial traffic;
- traffic between the rest of Riga and the rest of Latvia (red), regarded as external tangential traffic;
- transit traffic from the rest of Latvia to the rest of Latvia (brown), regarded as through going traffic.

The CBD is less important for freight transport, which can be seen on the Akmens bridge and the Salu bridge. The broader view (figure II) shows that freight transport is partly directed towards areas outside Riga. The different radial roads are used for transport to the different parts of Latvia. Transit freight traffic exists, but the proportion of transit traffic is limited. The ring around Riga shows some transit traffic.

The figures for the Riga dam show that about 17% of all traffic is transit (in total approximately 170 vehicles per hour in the morning peak over both directions). The rest of the traffic has an origin or destination in Riga.

Figure I Relation types of freight traffic in the morning peak in Riga

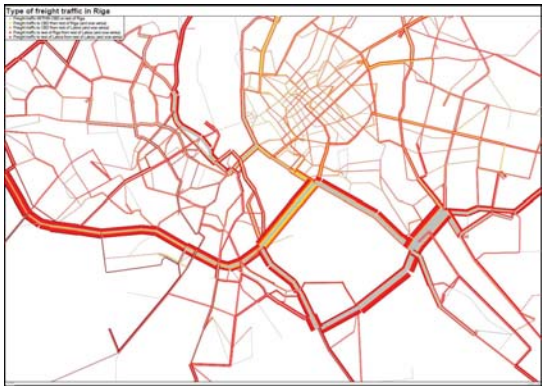


Figure II. Relation types of freight traffic in the morning peak in Pieriga

Stakeholders involved

Riga City Council, Latvian State Roads, Port authority, Airport authority.

Recommendations

Further development of the freight model in the future, on the basis of more detailed data.

APPENDIX II Meetings

table II.1. Working group and Steering committee meetings

No.	Date	Participants	Topic
1. (MoCI-04)	8th September, 2009	WG W+B	background, objectives, approach and organisation of the RPMP
2. (MoCI-08)	12th October, 2009	WG W+B	approval of the submitted Inception report, presentation of the progress, presentation of the planned approach
3. (MoCI-10)	10th November, 2009	WG W+B	presentation of 2nd Progress report and of 1st Interim report; presentation of the approach for Task III
4.	12th January, 2010	WG, Stakeholders, W+B	workshop on variant development
5. (MoCI-12)	14th January, 2010	WG W+B	approval of the 1st Interim report, discussion and analyses of the 2nd Interim report, discussion on workshop, SEIA procedure
6.	12th March, 2010	SC	approval of the RPMP objectives
7. (MoCI-15)	22nd March, 2010	WG, W+B	presentation of the 2nd and 3rd Interim reports, approval of the 2nd Interim report, discussion on 3rd Interim report
8. (MoCI-17)	16th April, 2010	WG, W+B	presentation and approval of the 3rd Interim report, progress on SEIA procedure
9. (MoCI-18)	18th May, 2010	WG, W+B	presentation of the improved 3rd Interim report, discussions, progress on SEAI procedure
10.	16th June, 2010	SC	selection of the preferred RPMP variant

table II.2. Core team meetings

no.	date	participants	topic
1. (MoCI-01)	7th July, 2009	MoT, Passenger train W+B	organisational aspects
2. (MoCI-02)	20th August, 2009	MoT, W+B	organisational aspects
3. (MoCI-03)	20th August, 2009	MoT, RCC, W+B	organisational aspects
4. (MoCI-05)	9th September, 2009	MoT, W+B	general remarks regarding the project
5. (MoCI-06)	9th September, 2009	MoT, W+B	institutional setting relation, financial investment schemes
6. (MoCI-07)	11th September, 2009	MoT, W+B	visit of EU representative to Riga, review of investments and measures on traffic and transport, planning
7. (MoCI-09)	14th October, 2009	MoT, Passenger train, Ministry of Finance, W+B	approach for evaluation of planned traffic and transport infrastructure investment projects, presentation, opinion EC
8. (MoCI-11)	16th December, 2009	Core team meeting	involvement of municipalities, sub-objectives, variant development
9. (MoCI-13)	27th January, 2010	MoT, Latvijas dzelzcels, RFPA, W+B	quick assessment of CF projects
10. (MoCI-14)	10th February, 2010	MoT, RCC City Development Department,	recently submitted documents (report on theme variants, modelling results)

no.	date	participants	topic
		W+B	
11. (MoCl-16)	22nd March, 2010	Core team members	recently submitted documents, planning
12. (MoCl-19)	18th May, 2010	Core team members	planning and comments concerning 3rd Interim report, SEIA procedure
13. (MoCl-20)	16th June, 2010	Meeting before SC	presentation to SC, comments on final 3rd Interim report

table II.3. Meetings with various stakeholders[24]

no.	date	participants	topic
1. (Mo3P-09)	7th September, 2009	Riga Geodetic Centre (Gunars Silabriedis, Vitolds Kvetkovskis, Evelina Budilovich, Dainis Mazkalkis); W+B (Dick Tensen, Arnaud Burgess, Jan Kiel, Bas Tutert)	EMME2 model for Riga
2. (Mo3P-10)	8th September, 2009	Latvian State Roads (Inara Pavlovska); W+B (Oskars Zivtins, Erik Jongenotter)	statistics of roads, policy and projects
3. (Mo3P-01)	8th September, 2009	RCC Traffic department (Daniels Liepins, Janis Laizans); W+B (Anke Rouwette, Reinoud Dirksen, Erik Jongenotter, Ed van Koppen)	institutional aspects local PT company, organisational aspects of minibuses, regional buses, marketing, traffic
4. (Mo3P-02)	8th September, 2009	RCC City Development Department (Andis Kublacovs); W+B (Adriaan Roest Crollius)	legal and institutional situation, financing review
5. (Mo3P-03)	8th September, 2009	JSC 'Pasazieru vilciens (Andulis Zidkovs); W+B (Adriaan Roest Crollius)	background of the project and institutional settings, planning
6. (Mo3P-11)	9th September, 2009	Rigas Satiksme (Andrians Lublins); W+B (Dick Tensen, Bas Tutert, Ed van Koppen)	planning and projects, operations, data for network analyses, data for financial performance
7. (Mo3P-04)	9th September, 2009	Riga Planning Region (Armands Puzulis); W+B (Adriaan Roest Crollius)	institutional processes accepting and integrating development plans
8. (Mo3P-05)	9th September, 2009	Ministry of Regional Development and local Government, Spatial planning department (Inguna Urtane); W+B (Adriaan Roest Crollius)	institutional setting relation MoT and municipalities
9. (Mo3P-12)	9th September, 2009	LDZ (Ivars Zalais, Sandis Austrums, Kaspars Berzins, Aigars Sinevics); W+B (Bas Tutert, Ed van Koppen)	general, services of LDZ, competition, data, new directions
10. (Mo3P-06)	9th September, 2009	LDZ (Maris Riekstins, Vladimirs Irishkovs); W+B (Arnaud Burgess)	rail freight developments
11. (Mo3P-08)	9th September,	CSB (Edite Miezite);	transport statistics for MP

[24] This table gives an overview of those meetings of which minutes have been prepared. Additionally various more informal meetings and discussions have taken place in Riga, by telephone and by e-mail

no.	date	participants	topic
	2009	W+B (Arnaud Burgess, Jan Kiel)	
12. (Mo3P-13)	9th September, 2009	RCC, Traffic Department (E. Kalvina); W+B (Anke Rouwette, Bas Tutert, Karin Sluis, Erik Jongenotter)	statistics, Intelligent Transport Systems and infrastructure, traffic policy
13. (Mo3P-15)	9th September, 2009	RGC (Evelina Budilovich); W+B (Arnaud Burgess, Jan Kiel, Bas Tutert)	transfer of data
14. (Mo3P-07)	10th September, 2009	Riga FPA (Leonids Loginovs, Vladimirs Makarovs); W+B (Albert Treffers, Oskars Zivtins)	port and RPMP, Daugava river crossing
15. (Mo3P-14)	10th September, 2009	RNTC (Andis Kublacovs, Nika Kotovica, Gatis Pavils); W+B (Dick Tensen)	planning and financing of RNTC
16. (Mo3P-16)	21st September, 2009	Jana seta; W+B (Oskars Zivtins, Carien Aalbers)	maps, online map of traffic in Riga
17. (Mo3P-17)	2nd October, 2009	Mikrokods; W+B (Oskars Zivtins, Carien Aalbers)	GIS map
18. (Mo3P-18)	12th October, 2009	Latvian State Roads (Gundars Kains); W+B (Dick Tensen, Martijn Akkerman, Oskars Zivtins)	E22 new section
19. (Mo3P-19)	12th October, 2009	RCC, Traffic department (Eva Kalvina); Riga Traffic (Ivars Zarumba); W+B (Dick Tensen, Martijn Akkerman, Oskars Zivtins)	parking policy and P+R facilities, public transport, NMT
20. (Mo3P-20)	14th October, 2009	Riga Traffic (Ervins Straupe, Eriks Mentelis); Riga Traffic, parking department (Egils Dirins, Irina Spiridonova); W+B (Martijn Akkerman, Oskars Zivtins)	role of Riga traffic in parking policy, development of P+R facilities, development of underground parking
21. (Mo3P-21)	14th October, 2009	Rigas GeoMetrs (Evelina Budilovich); W+B (Jan Kiel, Carien Aalbers)	car ownership next to employment and population, OD matrices
22. (Mo3P-22)	20th October, 2009	Latvian State Roads (Valdis Lauksteins): W+B (Adriaan Roest Crollius, I. Lacenberga –Rocena)	cooperation, capacity, problems
23. (Mo3P-23)	20th October, 2009	SJSC Pasazieru vilciens (Ivars Zalais) W+B (Adriaan Roest Crollius, I. Lacenberga –Rocena)	cooperation in general, in order to integrate railway public transport in PT system of Riga and Pieriga territory
24. (Mo3P-24)	20th October, 2009	RCC Traffic Department (Ivars Zalais) W+B (Adriaan Roest Crollius, I. La-	capacity, coordination and cooperation

no.	date	participants	topic
		cenberga –Rocena)	
25. (Mo3P-25)	21st October, 2009	Riga City Traffic Department (Maris Pekalis, Inara Briksne); MoT (Jolants Austrups) W+B (Adriaan Roest Crollius, I. Lacenberga –Rocena)	coordination and cooperation
26. (Mo3P-26)	26th October, 2009	RCC Traffic Department (Olita Sproge); W+B (Andre van Kuijk, Silvija Sile)	environmental approach
27. (Mo3P-27)	26th October, 2009	RCC Housing and Environmental department (Dace Danilane, Miervaldis Lacis); W+B (Andre van Kuijk, Silvija Sile)	environmental approach
28. (Mo3P-28)	27th October, 2009	Ministry of Environment, Environmental State Bureau (Arnolds Luksevics); W+B (Andre van Kuijk, Silvija Sile)	environmental approach
29. (Mo3P-29)	27th October, 2009	MoT (Jolants Austrups, Daiga Dolge); W+B (Andre van Kuijk, Silvija Sile)	environmental approach
30. (Mo3P-30)	11th November, 2009	Rigas Satiksme (Reinis Auzins, A. Logins); W+B (Ed van Koppen)	key performance model, performance and problems of operator
31. (Mo3P-31)	12th November, 2009	Road Transport Administration (R. Timma, I. Briksne); W+B (Ed van Koppen, Dick Tensen)	tasks and working procedure of institution regarding regional buses
32. (Mo3P-32)	14th December, 2009	Arhitektu birojs SZK (Andis Silis, Manten Devriendt); W+B (Martijn Akkerman)	central Station development project, relation to RPMP
33. (MoMu-01)	14th December, 2009	Adazi municipality (Silvis Grinbergs); W+B (Dick Tensen, Anke Rouwette, Oskars Zivtins)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
34. (MoMu-02)	14th December, 2009	Carnikava municipality; W+B (Dick Tensen, Anke Rouwette, Oskars Zivtins)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
35. (MoMu-03)	14th December, 2009	Garkalne municipality (Jelena Toca); W+B (Dick Tensen, Anke Rouwette, Oskars Zivtins)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
36. (MoMu-06)	15th December, 2009	Pinki municipality (Andrejs Ence); W+B (Martijn Akkerman, Anke Rouwette)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
37. (MoMu-08)	16th December, 2009	Jurmala municipality; W+B (Dick Tensen, Martijn Akkerman, Elmars Danisevskis)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
38. (MoMu-09)	16th December, 2009	Kekava municipality; W+B (Dick Tensen, Martijn Akker-	traffic and transport problems, plans, cooperation,

no.	date	participants	topic
		man)	general info, priorities for the RPMP
39. (MoMu-04)	17th December, 2009	Marupe municipality; W+B (Dick Tensen, Anke Rouwette)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
40. (MoMu-05)	17th December, 2009	Ogre municipality (Uldis Apinis, Maija Rinka); W+B (Dick Tensen, Anke Rouwette)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
41. (MoMu-07)	17th December, 2009	Jelgava municipality (including Ozolnieki) (Arnis Ozols, Gunita Osite); W+B (Dick Tensen)	traffic and transport problems, plans, cooperation, general info, priorities for the RPMP
42. (MoMu-33)	13th January, 2010	RCC Traffic department (Janis Lagzdons, Daniels Liepins); W+B (Reinoud Dirksen, Onno Pruis)	ownership surrounding of railway trucks, introduction of low floor rolling stock, relation between train and city transport, park and ride, development on West bank of Daugava river, connecting to airport, changes in operational services, cycling
43. (MoMu-35)	15th April, 2010	RCC Finance department (Roberts Remess); W+B (Albert Burgers, Daiga Dolge)	composition of budget, distributions of financing, loans, PPP, public transport
44. (MoMu-36)	5th May, 2010	RCC Traffic department (Eriks Sulcs); City Development Department (Andis Kublacovs, Gatis Pavils) W+B (Erik Jongenotter, Sebastian Tutert, Oskars Zivtins)	priorities of RCC, basic variants for MP, discussions about MP
45. (MoMu-37)	6th May, 2010	CSSD (Road traffic safety directorate) (Aldis Lama, Alvis Pukitis); W+B (Erik Jongenotter, Oskars Zivtins)	traffic safety issues, road safety auditing
46. (MoMu-38)	12th May, 2010	Latvian State Roads (Valdis Lauksteins); W+B (Adriaan Roest Crollius, I. Lacenberga –Rocena)	road maintenance, National development plan 2030; prioritization of the projects

APPENDIX III Results cost benefit analysis of the variants

investment and maintenance costs in CBA

The investment costs relate to the construction costs of the various measures in the variants. For projects in Riga and Pieriga which are studied before these costs have been retrieved from available feasibility studies. The investment costs for other measures of which no data were available has been established based on unit prices from various sources. In a few cases this approach was not possible, and a provisional sum has been established. In table III.1 the investments costs are summarised; details are presented in table III.1.

table III.1. Investment costs in EUR x1,000 (excluding VAT)

	variant A 'sparse, high capacity main street and road network'	variant B 'dense main street and road network'	variant C 'increase use of Southern Bridge'
bridges and their access streets/roads	1,561,000	125,000	0
new road and street infrastructure	65,130	33,030	83,030
reconstruction of roads and streets	7,978	34,258	33,758
other road measures e.g. traffic management	15,300	15,300	20,000
train infrastructure and stations	128,975	128,975	128,975
public transport new infrastructure (not train)	132,795	132,795	132,795
public transport reconstruction of existing infrastructure/stations/platforms	177,030	177,030	177,030
total amount of investments	**2,088,208**	**646,388**	**575,588**
conversion factor	0.784	0.784	0.784
economic value	**1,637,155**	**506,768**	**451,261**

For a part of the investment amounts terminal values have been taken into account in case the investment has a longer assumed technical or economic lifetime than the CBA period of 25 years. This is the case for the RNTC bridge or tunnel (assumed lifetime of 100 years), road (re)constructions (40 years) and new constructions of public transport infrastructure (40 years). The terminal value has been calculated on the basis of linear decrease of the value; if for example an investment has a lifetime of 40 years, the terminal value after 25 years is (40-25)/40 = 37,5% of the investment amount.

Excluded from the investment costs are:

- the cost of technical design, tender documents, etc;
- cost of land (acquisition). It is expected that the value of land increases during the projection period. As such the 'present value' of the land at the end of the projection period is assumed to be similar to the value at the start of the project;
- disruption of traffic during the construction period;
- operating costs. These can occur if functioning of infrastructure has to be managed or controlled, e.g. moving bridges, signals, railway switches and crossings, traffic control systems, etc.. This cost is assumed to be small and is therefore neglected.

Maintenance cost is calculated as 3 % of the investment cost for all infrastructure, with the exception of bridges for which 0.3 % maintenance cost is assumed.

Main road projects in Pieriga are projects of which Latvian State Roads has carried out separate feasibility studies. Some of these studies are somewhat outdated or are reviewed at present day. In the CBA

of the RPMP these projects have been excluded from the investment list since they have proven to be feasible as single project. In table III.2, the results of the single feasibility studies is given based on the information provided by Latvian State Roads in May 2010.

table III.2. Summary of CBA results of Latvian State Roads main road projects in Pieriga

project	discount rate used in study	costs in EUR x 1.000	NPV in EUR x 1.000	IRR
RD16s. Cohesion Fund project E22 (Riga (Tinuzi) – Koknese)	5,5 %	145.300	431.944	20,8 %
RD17m. Reconstruction of E77/A2 between Riga Bypass and Senite	6 %	89.042 (reduced to 56.000)	191.802	6,1 %
RD18m. Construction of E67/A7 Kekava bypass	5 %	60.362 (reduced to 55.000)	590	6,0 %
RD19m. Reconstruction of Riga Bypass E67/A4	8 %	267.456 (reduced to 127.000)	174.590	13,28 %

The feasibility studies of the Kekava bypass and the reconstruction of the E77/A2 are currently reviewed by Latvian State Roads. Redesign of the proposed alternative has led to cost reductions of these projects to MEUR 56 for the Senite project and MEUR 55 for the Kekava bypass. Furthermore, a cost reduction study of the reconstruction of Riga Bypass E67/A4 has led to a lowered estimation of MEUR 127. Taking into account the proposed cost reductions, the total implementation costs are lowered to 383,3 MEUR in stead of 562,16 MEUR.

In the reference variant, which was set in December 2009, the complete Eastern Arterial is included. This has also been used as reference variant for the CBA. Recently Riga City Council and the Ministry of Transport have concluded there is no budget available for parts of this project therefore these parts should have been left out of the reference variant. Changing the reference variant in this stage of the project would cause a delay in the process. For this reason the estimated investment for the segment Ieriku-Vietalvas in the Eastern Arterial being MEUR 40 (source RCC) needs to be financed as well and is not part of the CBA.

cost benefit analysis

The quantity of the benefits for each variant has been calculated by deducting the modelling results of the REF scenario from the different variants. It concerns differences in:

- trips;
- distance for the various modalities (km);
- travel-time (hours).

The tables below summarise these results of the difference between REF and the variants.

table III.3. Result of the modelling for variant A

	trips (million)		trip time (Mhours)		trip distance (Mkm)	
	difference		difference		difference	
car	- 8.5	- 2.0 %	- 15.5	- 8 %	52	1 %
public transp. [1)]	+ 31.8	18 %	+ 14	19 %	32.8	32 %
truck	0	0 %	- 1.2	- 8 %	- 8.2	- 1 %

1) for public transport in passengers, for other modalities in vehicles

table III.4. Result of the modelling for variant B

	trips (million)		trip time (Mhours)		trip distance (Mkm)	
	difference		difference		difference	
car	-10.5	-2.4 %	- 4.7	-2 %	-12.8	0 %
public transp. [1)]	+32.8	18 %	14.6	20 %	+ 342.2	33 %
truck	0	0 %	- 0.5	-3 %	-0.1	- 1 %

1) for public transport in passengers, for other modalities in vehicles

table III.5. Result of the modelling for variant C

	trips (million)		trip time (Mhours)		trip distance (Mkm)	
	difference		difference		difference	
car	- 10.6	-2.5 %	- 5.0	- 2 %	- 37	-2 %
public transp. [1)]	32.8	18 %	14.6	20 %	+ 342.2	33 %
truck	0	0 %	- 0.1	0 %	- 0.1	0 %

1) for public transport in passengers, for other modalities in vehicles

The incremental distance and time (plus or minus) are multiplied with the various values related to time and distance. The operating costs (eliminate some inefficient PT lines) are included as separate benefits.

The input for the CBA is (partly) retrieved from the transport model. The model has forecasted the future volumes (per variant) for car and public transport. However, only measures that have effect upon travel time and distance are included in the transport model. At the same time several public transport soft measures are included in the variants which improve the comfort of public transport and lead to extra trips. These are not accounted for in the transport model. In order to express the effectiveness of these measures it is assumed that these result in an (additional) reduction of car use. The below tables present the results in which a 3 % reduction of car use resulting from soft measures has been assumed.

The economic analysis of the variant A demonstrated a quite high rate of return of 11.4 %. This result is mainly explained by the decrease in car travel time (8 %) and the value attributed by travellers to time. Variant B and C have in IRR in the range of 6-8 %. The IRR of variant C is slightly higher, among others due to a shorter trip distance of cars.

table III.6. Economic cost benefit analysis for variant A (selected years, in MEur)

Variant A	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2040
COSTS (MEuro)													
NTC bridge	0	0	0	0	1.249	0	0	0	0	0	0	0	0
NTC access road	0	0	0	0	312	0	0	0	0	0	0	0	0
new road infrastructure	19,5	5,1	5,1	5,1	5,1	5,1	5,1	5,1	5,1	5,1	0	0	0
reconstruction of roads	2,4	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0	0	0
other road measures	4,6	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	0	0	0
train infrastructure and stations	38,7	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	0	0	0
PT new infrastructure	0	0	0	0	132,8	0	0	0	0	0	0	0	0
PT, reconstruction existing infra	53,1	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	0	0	0
Subt.investments (fin.)	118,3	30,7	30,7	30,7	1.724,5	30,7	30,7	30,7	30,7	30,7	0	0	0
Subt.investments (ec.) 1)	92,8	24,1	24,1	24,1	1.352,0	24,1	24,1	24,1	24,1	24,1	0	0	0
Maintenance & operation	0,0	3,5	4,5	5,4	6,3	24,3	25,2	26,2	27,1	28,0	28,9	28,9	28,9
Total costs	92,8	27,6	28,5	29,4	1.358,3	48,4	49,3	50,2	51,1	52,1	28,9	28,9	28,9
BENEFITS (MEuro)													
Increase ticket sales	0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Decrease O&M PT	0	2,6	5,2	7,7	10,3	12,9	15,5	18,1	20,6	23,2	25,8	25,8	25,8
Travel distance (car op.cost)	0	-12,5	5,8	24,0	42,3	-62,4	-44,2	-25,9	-7,6	10,6	27,6	27,6	27,6
Travel time (VoT)	0	2,3	41,0	79,6	118,2	11,6	50,2	88,9	127,5	166,2	204,8	204,8	204,8
Traffic safety	0	-0,3	0,6	1,4	2,3	-1,7	-0,8	0,1	1,0	1,9	2,8	2,8	2,8
Air pollution	0	-0,3	0,0	0,4	0,8	-1,7	-1,3	-0,9	-0,5	-0,2	0,3	0,3	0,3
Noise	0	-0,2	-0,1	0,0	0,1	-0,8	-0,7	-0,6	-0,5	-0,5	-0,4	-0,4	-0,4
Climate change	0	-0,3	0,0	0,4	0,7	-1,4	-1,1	-0,8	-0,4	-0,1	0,1	0,1	0,1
Residual value	0	0	0	0	0	0	0	0	0	0	0	0	2.086
Total benefits	0,0	-8,7	52,5	113,6	174,8	-43,5	17,7	78,8	140,0	201,2	261,0	261,0	2.347,1
Benefits-Costs (MEuro)	-92,8	-36,3	23,9	84,2	-1183,5	-91,9	-31,6	28,6	88,9	149,1	232,1	232,1	2318,1
EIRR	11,4%												
ENPV (5.5%, MEuro)	1.075												

1) a conversion factor of 0.784 for infrastructure investments has been used

table III.7. Economic cost benefit analysis for variant B (selected years, in MEur)

Variant B	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2040
COSTS (MEuro)													
Hanzas bridge	0	0	0	0	100	0	0	0	0	0	0	0	0
Hanzas access road	0	0	0	0	25	0	0	0	0	0	0	0	0
New road Infrastructure	9,9	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	0	0	0
reconstruction of roads	10,3	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	0	0	0
other road measures	4,6	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	0	0	0
train infrastructure and stations	38,7	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	0	0	0
PT new infrastructure	0	0	0	0	132,8	0	0	0	0	0	0	0	0
PT, reconstruction existing infras	53,1	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	0	0,0	0,0
Subt.investments (fin.)	116,6	30,2	30,2	30,2	288,0	30,2	30,2	30,2	30,2	30,2	0,0	0,0	0,0
Subt.investments (ec.) 1)	91,4	23,7	23,7	23,7	225,8	23,7	23,7	23,7	23,7	23,7	0,0	0,0	0,0
Maintenance & operation	0,0	3,5	4,4	5,3	6,2	12,2	13,1	14,0	14,9	15,8	16,7	16,7	16,7
Total costs (economic)	91,4	27,2	28,1	29,0	232,0	35,9	36,8	37,7	38,6	39,5	16,1	16,7	16,7
BENEFITS (MEuro)													
Decrease O&M PT	0,0	2,6	5,2	7,7	10,3	12,9	15,5	18,1	20,6	23,2	25,8	25,8	25,8
Travel time (VoT)	0,0	-0,1	-20,9	10,0	40,8	71,7	-104,4	-73,5	-42,7	-11,8	49,8	49,8	49,8
Travel distance (car op.cost)	0,0	-0,5	-12,7	5,3	23,3	41,3	-63,7	-45,7	-27,7	-9,7	29,9	29,9	29,9
Traffic safety	0,0	0,0	-0,3	0,6	1,4	2,3	-1,7	-0,8	0,1	1,0	3,0	3,0	3,0
Air pollution	0,0	-0,1	-0,3	0,0	0,4	0,8	-1,7	-1,3	-0,9	-0,5	0,3	0,3	0,3
Noise	0,0	-0,1	-0,2	-0,1	0,0	0,1	-0,8	-0,7	-0,6	-0,5	-0,4	-0,4	-0,4
Climate change	0,0	-0,1	-0,3	0,0	0,3	0,6	-1,5	-1,2	-0,9	-0,6	0,0	0,0	0,0
Residual value	0	0	0	0	0	0	0	0	0	0	0	0	208
Total benefits	0,0	1,7	-29,6	23,5	76,6	129,7	-158,3	-105,2	-52,1	1,0	108,5	108,5	316,2
Benefits-Costs (MEuro)	-91,4	-25,5	-57,7	-5,5	-155,4	93,8	-195,1	-142,9	-90,7	-38,5	68,1	91,8	264,8
EIRR	6,6%												
ENPV (5.5%, MEuro)	72,6												

1) a conversio'n factor of 0.784 for infrastructure investments has been used

table III.8. Economic cost benefit analysis for variant C (selected years, in MEur)

Variant C

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2040
COSTS (MEuro)													
New road Infrastructure	24,9	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	0	0	0
reconstruction of roads	10,1	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	0	0	0
other road measures	6,0	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	0	0	0
train infrastructure and stations	38,7	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	0	0	0
PT new infrastructure	133	0	0	0	0,1	0	0	0	0	0	0	0	0
PT, reconstruction existing infras	53,1	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	0	0	0
Subt.investments (fin.)	132,8	34,4	34,4	34,4	167,2	34,4	34,4	34,4	34,4	34,4	0	0	0
Subt.investments (ec.) 1)	104,1	27,0	27,0	27,0	131,1	27,0	27,0	27,0	27,0	27,0	0	0	0
Maintenance & operation	0,0	4,0	5,0	6,1	7,1	8,5	9,5	10,6	11,6	12,6	13,7	13,7	13,7
Total costs (economic)	104,1	31,0	32,0	33,1	138,2	35,5	36,5	37,6	38,6	39,6	13,7	13,7	13,7
BENEFITS (MEuro)													
Increase ticket sales	0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Decrease O&M PT	0	2,6	5,2	7,7	10,3	12,9	15,5	18,1	20,6	23,2	25,8	25,8	25,8
Travel distance (car op.cost)	0	2,6	5,3	7,9	10,5	13,1	15,8	18,4	21,0	23,6	26,8	26,8	26,8
Travel time (VoT)	0	0,8	1,7	2,5	3,4	4,2	5,1	5,9	6,8	7,6	7,6	7,6	7,6
Traffic safety	0	-0,3	0,6	1,4	2,3	-1,7	-0,8	0,1	1,0	1,9	3,0	3,0	3,0
Air pollution	0	-0,3	0,0	0,4	0,8	-1,7	-1,3	-0,9	-0,5	-0,2	0,3	0,3	0,3
Noise	0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Climate change	0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	-0,2	-0,2	-0,2
Residual value	0	0	0	0	0	0	0	0	0	0	0	0	203
Total benefits	0	5,3	12,7	20,0	27,4	26,8	34,2	41,5	48,9	56,2	63,3	63,3	216,6
Benefits-Costs (MEuro)	-104,1	-25,6	-19,3	-13,0	-110,8	-8,7	-2,4	3,9	10,2	16,6	49,6	49,6	202,9
EIRR	8,4%												
ENPV (5.5%, MEuro)	119,0												

1) a conversion factor of 0.784 for infrastructure investments has been used

It is noted that the incremental hours of the variants have been multiplied with the VoT for the different modalities. For cars for example, a value of 11.7 euro per hour for 'business purposes' and 4.8 euro per hour for private purposes has been assumed (source Heatco, 2006), in the proportion 20 % and 80 %.

In relation to the sensitivity of (value of) travel time changes, it is also noted that the VoT is income related, which means that with an increasing wealth the VoT also becomes higher. An annual increase of 1 % of the VoT increases the EIRR between 1 and 2 %.

APPENDIX IV Measures street network Riga

table IV.1. RPMP project street network Riga (RD = road measure, s = short term, m = medium term, a = annual, APc = construction in action program, APs = study in action program)

nr	project name	project description	implementation period	cost estimate (x € 1000)
RD1s (APc)	completion 3rd section Southern bridge	construction/expansion to 2 x 2 lanes 70 km/h on the West bank till the A7	Short term	23,000
RD6m (APc)	Connection ring structures	construction of connection between the city centre ring and the city ring	Medium term	2,000
RD10s (APc)	intersection Daugavgrivas iela - K. Valdemara iela and construction Ranka dambis tunnel	reconstruction of the connection of Daugavgrivas iela with K. Valdemara iela and construction of the Ranka dambis tunnel	Short term	104,000 (34,000 and 70,000)
RD4m (stage 1 APc)	Northern Transport Corridor	construction in stages of the complete Northern Transport Corridor including a river crossing (immersed tunnel or bridge)	Medium term (in stages)	1,561,000
RD2s (APc)	A. Caka iela and Brivibas iela	introduction of a one way system (A. Caka into the city centre, Brivibas out of the city centre) and improvement of railway crossing	Short term	1,575
RD3s (APc)	Terbatas iela and Kr. Barona iela	closure for private cars and reconstruction as PT/NMT streets	Short term	903
RD9m (APs)	Tangential route West bank	connection Kurzemes Prospekts - Jurkalnes iela including crossing under the railway	Medium term	30,100
RD11m (APs)	Kundzinsala and Tvaika iela connections	(Re)construction of the roads in the port area around Kundzinsala and Tvaika iela	Medium term	depending on studies
RD5m (APs)	Upgrade city centre ring	construction of bypass Valmieras iela to facilitate a good traffic flow on the ring, 50 km/h	Medium term	7,650
RD12m (APs)	Bolderaja connection	(Re)construction of the roads in the port area around Bolderaja to improve the access of the port area. Start of feasibility and design studies in the RPMP period.	Medium term	depending on studies
RD7m (APs)	Akmens bridge	downgrading from 2 x 2 to 2 x 1 lanes, with extra space for NMT and PT (no capacity reduction in variant C)	Medium term	300
RD8m (APs)	Vansu bridge	reconstruction of the connection from Vansu bridge to the north, closure of the connection to the south	Medium term	500

nr	project name	project description	implementation period	cost estimate (x € 1000)
RD18a (APc)	Traffic management and monitoring system	traffic management to improve traffic flows on the city ring and city centre ring by means of adaptive traffic control and PT-priority system. On the medium term the basis for a traffic monitoring system is set.	Annual, to start at a short term	5,000
RD17a (APc)	Completion of the main street network	measures to eliminate missing links and bottlenecks in the main street structure	Annual, to start at a short term	5,000
RD19a and RD29a (APc)	Traffic Safety Riga and Pieriga	budget for improvement of traffic safety at black spots, pe-destrian crossings etc.	Annual, to start at a short term	5,000
RD16a (APc)	Traffic calming City centre	reduction of maximum speed to 30 km/h and introduction of traffic calming measures	Annual, to start at a short term	5,000
			total investments	1,751,028[25]

[25] The total investment differs slightly from the investment included in the CBA, due to changed estimates and inclusion of two extra projects. The effect on the CBA outcome is marginal.

APPENDIX V Measures road network Pieriga

table V.1. RPMP measures road network Pieriga (RD = road measure, s = short term, m = medium term, a = annual, APc = construction in action program, APs = study in action program)

nr	project name	project description	implementation period	cost estimate (x € 1000)	comments
RD20s (APc)	E22 project	upgrade of E22 route to 2x1 high class road with design speed 100 km/h between Riga Bypass (Tinuzi) and Koknese	current - 2012	145,300	-
RD21s (APc)	E77/A2	reconstruction of the Riga bypass to Senite into a safe, high class dual carriageway, 2x2, 110 km/h	2014-2017	89,042	PPP pilot project
RD23m	E67/A7	construction of a bypass in the A7 around Kekava	after RPMP period	60,362	-
RD24m	E67/A4	reconstruction of the Riga bypass section between A2 and A6 into a safe, high class dual carriageway, 2x2, 110 km/h	after RPMP period	267,456	-
RD19a and RD29a (APc)	traffic safety measures	measures for improving traffic safety (e.g. reconstruction of intersections, NMT crossing facilities)	short term, continuously	5,000	

APPENDIX VI Measures rail and public transport network

table VI.1. RPMP measures rail and public transport network (PT = public transport measure, APc = construction in action program, APs = study in action program, APa = annual investment in action program)

nr	project name	project description	implementation period	cost estimate (x € 1000)	comments
PT1 (APc)	P+R facilities	P+R facilities at 50 % of all stations, including B+R facilities	50 % of costs in first 7 years	4,200	35 stations, total of 1400 places in Pieriga
PT2	station at Urban Development West bank	new station at Urban Development West bank (replacement of Tornakalns station)	implementation after 2017	20,000	
PT3 (APa)	elimination of speed restrictions	elimination of speed restrictions on track	high priority, 100 % before 2017	27,000	
PT4 (APa)	rail measures	repairs, new sleepers and/or ballast, total	high priority, 100 % before 2017	14,000	35km
PT5 (APa)	upgrade of small stations	Upgrade of small stations: platforms of 55 cm, clocks, standardized and improved information, shelters, improve safety of railway crossings to the platforms	50 % of costs in first 7 years	21,500	approximately 43 small stations
PT5 (APa)	passenger crossings	security passenger crossings at stations/stops	high priority, 100 % before 2017	1,625	approximately 65 stations/crossings
PT5 (APa)	upgrade of larger stations	upgrade of larger stations: platforms of 55 cm, clocks, standardized and improved information, shelters, improve safety of railway crossings to the platforms	high priority, 100 % before 2017	24,000	approximately 24 larger stations
PT5 (APa)	safety measures	increase safety at level crossings	high priority, 100 % before 2017	1,650	approx. 11 crossings
PT6 (APc)	upgrade of Riga central station	basic upgrade of Riga central station, including new covered platforms, bicycle facility	high priority, 100 % before 2017	25,000	Basic upgrade of platforms, platform covering, bicycle storage and dynamic displays
PT7 (APa)	tram Riga	upgrade the tramway network by renewal of old tracks	50 % of costs in first 7 years	115,000	

nr	project name	project description	implementation period	cost estimate (x € 1000)	comments
PT8 (APa)	tram Riga	remove old tracks of tramline 2 between Tapesu iela and Lielirbes iela, tramline 5 between Eksporta iela and Milgravis and tramline 10 between Bisumuiza and Ziepniekalna iela	high priority, 100 % before 2017	1,030	
PT9 (APa)	tram Riga	build tramway platforms to obtain easy access to all passengers, especially older, handicapped people and parents with buggies, be practical: combine this with the introduction of new low floor trams, reconstruction works of streets.	50 % of costs in first 7 years	5,000	
PT10 (APa)	tram Riga	realise attractive shelters providing waiting comfort on 100 % of tramway stops towards city centre and 80 % in the opposite direction	high priority, 100 % before 2017	2,000	
PT11 (APa)	tram Riga	install dynamic displays showing actual departure times or waiting times, including hard and software in vehicles	high priority, 100 % before 2017	2,000	budget based on 250 vehicles and 50 most used stops
PT12 (APs)	Tram to the Airport	tram connection to the airport consisting of shortcut of 0,7 km via Barinu iela, a shortcut of 0,6 km via Maza Nometnu iela, 5 km of new tracks, viaduct over railway and A10	decision for construction after feasibility study, realization after 2017	80,400	Feasibility study necessary, costs appr. € 250.000, in period until 2017
PT13 (APc)	tram Riga	new track (0,6km) and terminal (4 mln) in Dole at P+R (P+R not included)	priority, realization until 2017	8,800	
PT14	tram Riga	new terminal of tramline 5 at Andrejsala	no priority, implementation after 2025	1,000	
PT15 (APc)	tram Riga	reform the Barona iela into an tramway priority domain including high quality pedestrian zone and bicycle lanes	high priority, 100 % before 2017	4,000	Link with creating one-way traffic on Brivibas iela and A. Caka iela
PT16 (APc)	tram Riga	transfer points to improve interchange facilities between tram, trolley and bus	high priority, 100 % before 2017	5,000	

nr	project name	project description	implementation period	cost estimate (x € 1000)	comments
PT17 (APc)	tram Riga	central Station: Upgrade and rerouting of tramway for a better connection of tram and train (route from Akmens bridge, 13 Janvara iela and Marijas iela and Elisabeth iela to K. Barona Ilea)	decision for construction after design study	10,000	Integral design with PT18
PT18 (APc)	tram Riga, trolley-bus	reconstruction of Gogola iela with separate PT lanes and new (trolley)bus stops	high priority, 100 % before 2017	6,000	Integral design with PT17
PT19 (APc)	minibuses	upgrade of bus station at Central Station, removal of minibus stops at Central Tirgus	high priority, 100 % before 2017	2,000	
PT20 (APc)	tram Riga, trolley-bus	park and Ride facilities in Riga at 4 locations near tram stops, new 1000 spaces in total, improvement of walkway to stops, information	50 % of costs in first 7 years	3,500	
PT21 (APc)	bus and trolleybus Riga	create a separate bus lane on Brivibas iela and A. Caka iela in the opposite direction of the one-way direction of cars;	high priority, 100 % before 2017	1,000	link with creating one-way traffic on Brivibas iela and A. Caka iela
PT22	trolleybus Riga	extend the trolleybus network from Petersala iela to Andrejostas iela (Andrejsala)	no priority, implementation after 2025	650	
PT23 (APc)	trolleybus Riga	extend the trolleybus network from Pilsonu iela (Kliniska Slimnika) to Marupe (Sejas iela or Brueklenu iela) (2700 meters) and eliminate diesel buses on the same route.	high priority, 100 % before 2017	1,755	
PT24 (APc)	trolleybus Riga	extend the trolleybus network with 1400 meters from Ziepniekkalns to Ziepniekkalns DP while eliminating diesel buses on the same route.	high priority, 100 % before 2017	910	
PT25 (APc)	trolleybus Riga	extension of trolleybus from Sargandaugava to Aldaris, including improvement of street, new terminal in Aldaris and at Brasa	high priority, 100 % before 2017	1,200	
PT26 (APc)	trolleybus Riga	changed route for trolleybus line 18 in Dreilini and extended in Mezciems to a new terminal	high priority, 100 % before 2017	2,880	
PT26 (APc)	trolleybus Riga	separate bus lane for trolleybus line 18 in Dreilini	priority, realization until 2017	5,500	

nr	project name	project description	implementation period	cost estimate (x € 1000)	comments
PT27 (APa)	bus and trolleybus Riga	separate bus lanes, priority measures on new trolleybus lines	50 % of costs in first 7 years	20,000	
PT28 (APa)	regional buses	improvement of comfort and safety of bus stops in Pieriga	50 % of costs in first 7 years	3,000	funding for municipalities
			total	**421,600**	

APPENDIX VII RPMP supporting measures for public transport

table VII.1. RPMP supporting measures for PT

nr	project name (Soft measures)	project description	implementation period	cost estimate (€)	comments
PTS1	passenger friendly time table development for train, S1, S2, S3 and RE1	create a train system with a basic interval timetable with regular intervals of 30 minutes or less: clear network and lines, network map in stations and trains, fast acceleration and deceleration, short station stop times.	implementation in 2011, investment is incidental	120,000	easy to understand and promote PT, feeling of speed, more direct connections, less space needed in Riga Central Station, attract more passengers.
PTS2	shorten travel times for train, RE1	introduction of fast train service with a regular interval, RE1, connecting stations with larger number of passengers and/or longer distances from Riga. Communication of the new benefits for passengers.	implementation in 2011, investment is annual but is part of regular development of PT network	60,000	making train more attractive to inhabitants of villages on larger distances of Riga. Reduced travel time competes with travelling by car. This measure is more technical than marketing. However: product is a part of marketing.
PTS3	shorten travel times from Pieriga to Riga (Commuter)	closure of 21 of 88 stations in Pieriga with very low passenger flows (less than 50.000 per year). Communication about alternatives and benefits for other passengers.	implementation in 2011, investment is annual for period of 8 years period. Removing costs are not calculated	60,000	shorter travel times on other connections, less investments in stations and lower operation costs. Trough lines between the bigger stations are more attractive for most passengers. This measure is more technical than marketing. However: product is a part of marketing.
PTS4	improve chain mobility for train, S-lines and RE2	introduce or enhance a local (mini)bus service to the station with an integrated tariff to the station in towns like Ogre, Sigulda, Tukums, and Jelgava. Communication to passengers. Measure attracts more train passengers to Riga.	implementation in 2011, investment is structural for period of 4 years (time needed to implement system in all cities)	40,000	easy access using public transport in Riga and Pieriga, in order to comfort passengers. This measure is more technical than marketing. However: product is a part of marketing.

nr	project name (Soft measures)	project description	implementation period	cost estimate (€)	comments
PTS5	improve chain mobility for train, S-lines and RE1	connect regional buses to stations offering good transfer quality. Communication to passengers. Measure attracts more train passengers to Riga.	implementation in 2011, investment is annual but is part of regular development of PT network	20,000	increase the catchment area of the new rail network, providing passengers faster connections and eliminate parallelism in PT-lines in order to realize more efficient operations.
PTS6	increase network efficiency for bus, see detailed sheet for appropriate lines	replace bus lines that are lower frequent: frequent tram- and trolleybus lines with an interchange between lines are a good alternative; communication about interchanges	implementation in 2011, investment is annual but is part of regular development of pt network	40,000	creating a more efficient network which is also necessary to cope with reduced transport volumes in the future. in this way it is possible to upgrade frequencies of corridors (tram as well as bus), so travel times reduces. this measure is more technical than marketing. however: product is a part of marketing. most important effect of this measure is to save money in order to improve the network.
PTS7	increase network efficiency for minibus in Riga	reroute minibus lines that are parallel to existing or new train, tramway or trolleybus lines over distances larger than 10 minutes; communication about new network.	implementation in 2011, investment is annual but is part of regular development of pt network	40,000	creating a more efficient network which is also necessary to cope with reduced transport volumes in the future. in this way it is possible to upgrade frequencies of corridors (for mini buses as well), so travel times reduces. this measure is more technical than marketing. however: product is a part of marketing. most important effect of this measure is to save money in order to improve the network.
PTS8	passenger friendly PTnetwork for tram and (trolley) bus in Riga	renumber lines tram 1-9; trolleybus 10-29 and bus lines 30 - 60	implementation in 2011, investment is annual but is part of regular development of pt network	30,000	improve passenger friendly and logical numbering of lines, avoid same numbers for tram- and(trolley) bus lines; this makes the network more readable and recognizable for passengers. this measure is more technical than marketing. however: product is a part of marketing.

nr	project name (Soft measures)	project description	implementation period	cost estimate (€)	comments
PTS9	shorten travel times for train, s1, s2 and re1	new (electric) trains, for RE1, S1, S2	investments of new rolling stock is not integrated in marketing costs	0	shorter travel times , better accessibility and comfort, image and lower operation costs. this measure is more technical than marketing. however: product is a part of marketing.
PTS10	improve accessibility and comfort and shorten travel times for train, s3	new diesel trains, for S3 and other trains to Krustpils, Daugavpils, Valga.	investments of new rolling stock is not integrated in marketing costs	0	shorter travel times , better accessibility and comfort, image and lower operation costs. this measure is more technical than marketing. however: product is a part of marketing.
PTS11	improve accessibility and comfort and shorten travel times for new tramline 1, 2 and 5	extend the number of new, attractive low floor trams on most important tramlines.	investments of new rolling stock is not integrated in marketing costs	0	provides more comfort, improves the image of the tramway, gives an easy access to all passengers and shortens boarding times. this measure is more technical than marketing. however: product is a part of marketing.
PTS12	passenger friendly network and improve efficiency for tram in Riga	transform the radial network of tramlines into a transversal network. the existing transversal lines with low frequencies can be eliminated.	implementation in 2011, costs are annual investment (structural)	0	create more direct connections within the city and create an easy understandable network with less lines. destinations far from the city centre are directly connected. this measure is more technical than marketing. however: product is a part of marketing. most important effect of this measure is to save money in order to improve the network.
PTS13	passenger friendly network and improve efficiency for bus and trolleybus in Riga	transform the radial network of trolleybus lines into a transversal network.	implementation in 2011, investment is annual but is part of regular development of pt network	0	create more direct connections within the city, less space for terminals in the city centre and an easy understandable network with less lines. this measure is more technical than marketing. however: product is a part of marketing. most important effect of this measure is to save money in order to improve the network.

nr	project name (Soft measures)	project description	implementation period	cost estimate (€)	comments
PTS14	bus and trolleybus in Riga	make easy to remember basic interval time tables for bus and trolleybus lines with intervals larger than 10 minutes: only use intervals of 10, 15, 20, 30 or 60 minutes;	implementation in 2011, investment is annual but is part of regular development of pt network	0	easy to understand and remember departure times and intervals make it easier and attracts more passengers.
PTS15	network efficiency for bus, see detailed sheet for appropriate lines	eliminate bus lines that are parallel to existing or new tramway or trolleybus lines over distances larger than 10 minutes;	implementation in 2011, investment is annual but is part of regular development of pt network	0	creating a more efficient network which is also necessary to cope with reduced transport volumes in the future. in this way it is possible to upgrade frequencies of corridors, so travel times reduces. this measure is more technical than marketing. however: product is a part of marketing. most important effect of this measure is to save money in order to improve the network.
			total	410,000	

APPENDIX VIII Marketing measures for PT

table VIII.1. RPMP marketing measures for PT

nr	project name (Marketing)	project description	implementation period	cost estimate (€)	comments
M1	define target, target groups and marketing strategies	create a positive way of thinking about travelling with public transport by organizing a marketing strategy. Define the targets and the strategies in a Specific, Measurable, Appointed, Realistic and Time lined (SMART) way. Define target groups, find partners to reach these target groups, find out what they need in order to use the public transport system. Define and develop marketing strategies to make public transport more attractive for target groups. Project is linked with projects 2 and 3 and describes basic marketing of PT in Riga and Pieriga.	implementation in 2011, costs are annual investment (structural)	145,000	improve the image of public transport. Public transport is a matter of making choices. What choices are we making and why? Finally we do want to increase the use of public transport by making it more attractive for target groups. Focus on target groups: Increase the use of public transport by making it more attractive for target groups. Commuter-passengers; young people (Not drive and drink); tourists
M2	market survey	try to know more of the passenger: what are the current target groups, why do they use public transport, what are trends in passenger numbers and routes. Measures are for example: polls, registration of passenger flows, registration of complains. Project is linked with projects 1 and 3 and describes basic marketing of PT in Riga and Pieriga.	implementation in 2011, costs are annual investment (structural)	30,000	possibilities to adapt the product more on the most important target groups. Increase the use of public transport by making it more attractive for target groups.
M3	monitoring of marketing actions	monitor al marketing actions. Project is linked with projects: 1, and 2 and describes the effects basic marketing of PT in Riga and Pieriga. Monitoring can exclude some taken actions or intensify others.	implementation in 2011, costs are annual investment (structural)	40,000	in order to improve marketing it is necessary to monitor the effects of measures. Was it a success, what did we get? What did the passenger get? Where all changes really improvements? Is the passenger satisfied with the changes?

nr	project name (Marketing)	project description	implementation period	cost estimate (€)	comments
M4	improve recognisability of tram, trolleybus and bus	make ticket booths and other selling points more recognizable by banners, signs etc.	implementation in 2011, investment is structural, including annual investments for updates and maintenance.	60,000	for people who don't travel daily it is hard to find out where to buy a public transport ticket. A sign or banner that is recognizable for public transport ticket booths, makes it easier to buy tickets and contributes positive image building.
M5	promotion and image building of train, tram, trolleybus and bus in Riga and Pieriga	promote the services by publications, banners, advertorials and distribute a free public transport magazine.	implementation in 2011, costs are annual investment (structural)	300,000	image building and making public transport more visible.
M6	improve recognisability and travel possibilities of the network of train, tram, trolleybus and regional bus in Riga and Pieriga	make a (schematic) map of all tram and trolleybus lines and all regional bus lines in Pieriga and place this in every trolleybus and tram. Do also include important destinations (tourists).	implementation in 2011, investment is incidental with minor annual investments for updates.	65,000	enhance insight in the travel possibilities of the public transport network in Riga for commuters and tourists.
M7	information system for train, tram, trolleybus and bus in Riga and Pieriga	develop a integral travel information system that provides information on the best possible public transport connection within Riga, Pieriga and in a later stadium Latvia. Best way is to develop a system that is based on proven technology	implementation in 2011, investment is structural, including annual investments for updates and maintenance.	200,000	give insight to people on travelling with public transport. Implementation in Riga and Pieriga but suitable to extend for Latvia. Costs are for implementation of first step.

nr	project name (Marketing)	project description	implementation period	cost estimate (€)	comments
M8	smart phone application (not only iPhone) for train, tram, trolleybus and bus in Riga and Pieriga	create an Internet application for smart phones in order to provide actual travel information for travellers at home or on the way to public transport.	implementation in 2011, investment is structural, including annual investments for updates and maintenance.	130,000	giving more actual travel information contributes to a reliable image of the public transport system as a whole. It's not that bad to wait a few minutes longer if you know how many minutes it will take. This marketing project is linked with infra project.
M9	actual travel information at stops for train, tram, trolleybus and bus in Riga and Pieriga	provide detailed and actual information on the heavy used tram and bus stops. In cases of calamities this system can also provide detailed information.	implementation in 2011, investment is annual for updates and maintenance.	250,000	giving more actual travel information contributes to a reliable image of the public transport system as a whole. It's not that bad to wait a few minutes longer if you know how many minutes it will take.
M10	actual travel information in buses in Riga.	provide detailed and actual information in buses in Riga. In cases of calamities this system can also provide detailed information.	implementation in 2011, investment is incidental with minor annual investments for updates and maintenance	250,000	giving more actual travel information contributes to a reliable image of the public transport system as a whole. It's not that bad to wait a few minutes longer if you know how many minutes it will take. Price is calculated for 100 buses approx.
M11	passenger friendly tariff system for train, tram, trolleybus and bus in Riga and Pieriga	introduce an integrated intermodal tariff system for Riga and Pieriga including bus and tram. Time is needed to introduce new tariffs. Intense promotion needed.	implementation in 2011, investment is incidental with annual investments for updates and maintenance	120,000	make use of public transport more attractive for commuter passengers by eliminating different tickets, waiting time at cashiers or vending machines.
			total	1,590,000	

APPENDIX IX Rolling stock calculations

rolling stock for PT networks

The necessary number and capacity of all rolling stock of all transport modes has been calculated for the RPMP network, the 2010 network and the reference network for all trams, trolleybuses and buses operated by Riga Satiksme. The calculation of the number of vehicles is based on the following principles:

- the trip time per line as used in the EMME2 transport model;
- at each terminal a time of 8 minutes has been assumed for recovery;
- the circulation time therefore is (trip time + 8 minutes)*2;
- the number of vehicles needed for operation is the circulation time divided by the headway in peek hours;
- the number of vehicles needed has been levelled up;
- a percentage of 15 % for technical reserve is assumed for trolleybuses and trams and 10 % for buses.

The results of the calculation show that the RPMP network can be operated with less vehicles and less operation costs than will be the case with a reference network that is almost equal to the existing network. This shows that the network efficiency increases.

table IX.1. Necessary rolling stock in reference situation and in the RPMP for PT

vehicles including technical reserve	tram	trolleybus	bus	total	difference
technical reserve	15 %	15 %	10 %		
2010	126	328	478	932	
reference	98	291	391	780	- 16 %
RPMP variant	85	242	274	601	- 36 %

NB: 126 trams are composed of 258 coupled Tatra-trams

The table shows that no investments in an increase in the number of trolleybuses or buses are necessary. For the operation of the most important tramlines a total of 65 low floor trams are needed. As already 20 trams have been ordered; in total 45 new trams will be necessary for the upgraded tram-network, including the new light rail connection to the Airport. Two tramlines (new tramline 3 and 4, from Ziepniekalna iela and Ilguciems to Riga station) are still operated with the modernised Tatra trams.

For the trolleybus system new investments in hybrid diesel engines could be useful. Instead of the electrification of the extensions as included in the infrastructural measures this gives the possibility to operate these extensions even without these investments in catenaries. However, operating trolleybuses with hybrid diesel motor is more expensive. A detailed study for each extension is recommended to find out the right solution. For more frequent extensions, like to Sargandaugava, Jugla 3 and Ziepniekkalns electrification will most likely be the best solution.

operation costs

To create an idea of the total operational costs the total time that trams, trolleybuses and buses are operated has been calculated. This is called the total scheduled trip time. This are all trip times of all vehicles that are made in one year.
The scheduled trip time per year has been calculated as follows:

- the trip time per line as used in the EMME2 transport model (peak hours);
- the number of trips, calculated with the frequency of trips in peak hours, off peak hours and in the evening;
- a year total can be represented with 322 working days equivalents.

In this time no hours for training, pauses, holidays etcetera are taken into account, so the time drivers are working will be (much) higher. The next table shows the operational hours (yearly) for tram, trolley-bus and bus, compared to the reference situation.

table IX.2. Operational hours in reference situation and in the RPMP

operational hours (yr)	tram	trolleybus	bus	total
reference	308.000	754.000	1.070.000	2.132.000
RPMP	268.000	656.000	670.000	1.594.000
difference	40.000	98.000	400.000	538.000

The table above shows the operational hours and the difference between the reference and the RPMP. The difference is the most important value in this table. It shows the increased overall efficiency of the proposed network as a result of the most important measures:

- shortening of tramlines and the introduction of transversal tramlines;
- redesign of the trolleybus network;
- eliminating and shortening of a lot of bus lines parallel to the tramway and trolleybus network;
- measures to increase the operational speed of the network (separate lanes, priority at traffic lights).

rolling stock train network

The calculation of the number of trains for the new network is based on the following principles:

- the trip time per line, where closure of stations, eliminated restrictions on speed-limits, new accessible trains have been taken into account;
- at each terminal a time of 10 or sometimes 15 minutes has been assumed for recovery;
- the circulation time therefore is (trip time + 10 or 15 minutes)*2;
- the number of trains needed for operation is the circulation time divided by the headway in peak hours;
- the number of trains needed has been rounded up;
- a percentage of 20 % for technical reserve is assumed.

This leads to the number of trains as presented in the table IX.3.

table IX.3. Number of trains needed in the RPMP network

	trains for operation	spare trains	total
diesel	17	4	21
electric	22	5	27
total	39	8	47

The number of trains is based on the information as given in table IX.4

table IX.4. Parameters train operation in the RPMP network

line	from	to	head-way-peak	head-way-off peak	head-way evening	Runtime (min)	turning time	circula-tion time	nr trains	remarks
RE1	Tukums	Aizkraukle	30	60	60	110	10	240	9	electric
S1	Sloka	Ogre	30	30	30	73	10	166	6	electric
S2	Jelgava	Saulkrasti / Skulte	30	30	30	88	10	196	7	electric
	Jelgava	Riga	30			40	10	100	4	electric
S3	Riga	Sigulda	30	60	60	120	15	270	10	diesel

line	from	to	head-way-peak	head-way-off peak	head-way evening	Runtime (min)	turning time	circula-tion time	nr trains	remarks
Other lines	Aizkraukle	Krustpils	120	120	120	40	10	100	1	diesel
		Daugavpils	120	120	120	140	10	300	3	diesel
	Sigulda	Valga	120	120	120	120	10	260	3	diesel
									7	

The capacity per train is also an important issue: how long should trains be to transport all people. There is a great difference between wintertime and summertime on the routes to Jurmala and Skulte. During the summer season the peak is twice as high as in winter times. With the data of the DE consult report the train capacity calculation has been made. The results are given in table IX.5.

table IX.5. Calculation of train capacities

route		year 2007	days	per peak hr	trains/hr	capacity per train needed
Jelgava	Riga	23,000	21	1,095	4	274
Tukums	Riga	25,000	21	1,190	4	298
Aizkraukle	Riga	23,000	21	1,095	4	274
Skulte	Riga	10,000	21	476	2	238

The DE consult has also estimated the passenger growth for the coming years. The results are given in table IX.6.

table IX.6. DE Consult report, estimated passenger growth (mln/year))

		2008	2020	2025
Jelgava	Riga	5.17	9.4	11.18
Tukums	Riga	10.72	15.41	17.37
Aizkraukle	Riga	6.63	10.11	11.55
Skulte	Riga	3.47	3.77	3.89

With the passenger growth given in table IX.6 a larger number trains will be necessary after 2025 than the numbers given in table IX.3. Tables IX.7 and IX.8 present the necessary number of trains on the long term and the parameters used for calculation.

table IX.7. Estimated number of trains necessary on the long term

	trains for operation	spare trains	total
diesel	17	4	21
electric	32	7	39
total	49	10	59

This number of trains is based on 6 trains per hour between Jelgava and Riga in 2025 and between Sloka and Ogre.

table IX.8. Parameters used for calculation of necessary trains on the long term

line	from	to	head-way-peak	head-way-off peak	headway evening	Run-time (min)	turning time	circulation time	number trains	remarks
RE1	Tukums	Aizkraukle	20	60	60	110	10	240	13	electric
S1	Sloka	Ogre	20	30	30	73	10	166	9	electric
S2	Jelgava	Saulkrasti/ Skulte	20	30	30	88	10	196	10	electric
	Jelgava	Riga	20			40	10	100	6	electric
S3	Riga	Sigulda	30	60	60	120	15	270	10	diesel
Other lines										
	Aizkraukle	Krustpils	120	120	120	40	10	100	1	diesel
		Daugavpils	120	120	120	140	10	300	3	diesel
	Sigulda	Valga	120	120	120	120	10	260	3	diesel
									7	

APPENDIX X Regulation (EU) No 1370/2007

on public passenger transport services by rail and by road

aspects on contracting the 'in-house' operator

Subject to the relevant provisions of national law, any local authority or, in the absence thereof, any national authority may choose to provide its own public passenger transport services in the area it administers or to entrust them to an internal operator without competitive tendering. However, this self-provision option needs to be strictly controlled to ensure a level playing field. The competent authority or group of authorities providing integrated public passenger transport services, collectively or through its members, should exercise the required control. The authority controlling the internal operator should also be allowed to prohibit this operator from taking part in competitive tenders organised within its territory.

'internal operator' means a legally distinct entity over which a competent local authority, or in the case of a group of authorities at least one competent local authority, exercises control similar to that exercised over its own departments;

Article 5.2. Unless prohibited by national law, any competent local authority, whether or not it is an individual authority or a group of authorities providing integrated public passenger transport services, may decide to provide public passenger transport services itself or to award public service contracts directly to a legally distinct entity over which the competent local authority, or in the case of a group of authorities at least one competent local authority, exercises control similar to that exercised over its own departments. Where a competent local authority takes such a decision, the following shall apply:

(a) for the purposes of determining whether the competent local authority exercises control, factors such as the degree of representation on administrative, management or supervisory bodies, specifications relating thereto in the articles of association, ownership, effective influence and control over strategic decisions and individual management decisions shall be taken into consideration. In accordance with Community law, 100 % ownership by the competent public authority, in particular in the case of public-private partnerships, is not a mandatory requirement for establishing control within the meaning of this paragraph, provided that there is a dominant public influence and that control can be established on the basis of other criteria.

APPENDIX XI Public transport authority

In the past the municipal transport companies were established which organised public transport (PT) in all aspects from strategic to operational level. Most of them were successful organisations until the '80s when costs and fares increased and level of patronage fell. To save costs and to increase the service level PT operations became subject to tendering procedures. The municipal operators were often split into a production company and a planning organisation - the public transport authority (PTA).

what is a PTA?

- a PTA is a governmental organisation which develops and controls PT;
- the PTA concentrates decision making power about public transport;
- the PTA has an intermediate position between the (municipal/regional) government and the PT market;
- the PTA is delegated from the government with respect to the tasks that have been commissioned to the PTA by legal regulations.

In the stage of restructuring PT the PTA will mainly focus on improving PT as a whole, in a later stage an optimal functioning of the PT market will require good procedures of tendering and contracting, solving bottlenecks and conflicts, as well as various kinds of policy measures.

advantages of a PTA

The establishment of a PTA has a few advantages, which are:

- a clear separation can be made between responsibilities for strategic, tactical and operational decisions;
- the PTA can make clear and quick decisions on PT issues.

The institutional position of the PTA can be a municipal body or a separate institution to which the responsibilities mentioned have been commissioned. The responsibility of the PTA can be extended to the whole administrative area that generate much commuter traffic between these areas and the Riga urban area. The employees of the PTA can be recruited from the present employees of the municipal Secretariat for Transport, from the network planners of the municipal transport company.

PTA and market regulation

The establishment of a Public Transport Authority is an indispensable preparation on developing a mature PT market, where public and private sector companies may compete on a level playing field. Especially as in Central Europe authorities often bear responsibilities for the state owned companies, there is a strong need for an independent regulatory and monitoring body.

The objective is to enhance the PTA, especially in its role of tendering and contracting public transport services. To make the PTA more effective, powers and responsibilities of the authorities and the operators need to be clearly defined;

- the authorities, within above-mentioned regulatory system of tendering and contracting, should focus at all responsibilities and decisions at strategic level. Within this regime the role of the authorities is to develop a comprehensive public transport policy and implementation plan;
- the PTA is responsible for all decisions at tactical level, basically entailing the implementation of the public transport policy set by the authorities;
- the PT sector, both public and private operators, is solely responsible for the daily operation of the services.

The anticipated results are more co-ordination and planning of the public transport services, more efficiency and transparency in spending subsidies, and fair and efficient tendering and contracting. The PTA should have an intermediate position between the authorities and the public transport market. The PTA will be commissioned with tasks and responsibilities by law, and in this respect act independently from the authorities. An independent Supervisory Council, consisting of representatives of the authority, the transport sector and PT customers, should monitor it. Key tasks of the PTA are the following:

1. developing an optimal PT network - The PTA will be responsible for the development of the PT network and the development of the timetables. This task covers both infrastructure provision (transport infrastructure and technical systems, such as information and ticketing systems) and procurement of PT services. This should be optimal in terms of interoperability, both with the modes and between the modes of transport. In this respect the PTA will be acting as the main advisor to the authority in the PT policy development. The optimal PT network should be the basis for the product specification, such as the modes of transport, routes, network and timetable, capacity and quality, fares, vehicles and labour conditions;
2. tendering and contracting PT services – From the optimal public transport network the PTA defines the lines and groups of lines to be tendered out. On behalf of the authority, the PTA will act as the tendering and contracting body of PT services. The PTA will manage the whole tendering procedure, from identification of lines and groups of lines to be tendered, to putting together the terms of reference, the announcement of the tender, the (pre) qualification of bidders, evaluation of proposals, contract negotiation and award, contract management and monitoring and evaluation of the contract;
3. monitoring and enforcement of contracts – The PTA will monitor and enforce the contracts on public transport services;
   For this and other tasks, a comprehensive traffic database should be established and maintained.
   For the enhancement of the PTA some key requirements have to be fulfilled;
4. the position of the PTA should be non-political, well defined and in due time fully independent from both the authorities and the transport sector;
5. financial resources should be sufficient and ensure continuity;
6. to stress independency and guarantee continuity, a multi-year service contract between the authorities and the PTA should define the tasks and responsibilities of the latter;
7. management and staffing need to be professional, competent and sufficient, and the authority should have all legal, economic and financial expertise by its own.

More information can be found in following EC research projects:

- ISOTOPE: Improved Structure and Organisation for Transport Operations of Passengers in Europe (4th FP);
- LEDA: Legal and regulatory measures for sustainable transport in European cities (4th FP);
- QUATTRO: Quality Approach in tendering urban public transport operations (4th FP);
- SORT-IT: Strategic organisation and regulation in transport (4th FP);
- MARETOPE: Managing and Assessing Regulatory Evolution in Local Public Transport Operations in Europe (5th FP).

APPENDIX XII Overview legal framework

table XII.1. Overview of the legal framework for PT services

name	in force since	purpose of the document
the State Administration Structure Law Valsts pārvaldes iekārtas likums	January 1, 2003	this Law determines the institutional system of State administration (including also private individuals, who perform tasks of State administration delegated to them) subordinate to the Cabinet of Ministers and states basic provisions regarding the operation of the State administration aiming to ensure a democratic, lawful, effective, open and publicly accessible State administration (the principles of the State administration and other provisions provided in this law in general are also applicable to institutions that are not subordinate to the Cabinet).
the Law on Regional Development Reģionālās attīstības likums	April 23, 2002	the Law on Regional Development states that Planning Region is state institution, which is the decision-making authority within the region, supervised by the MoR. The Planning Region Development Council consists of all the heads of the local municipalities comprising this planning region.
the Law on Local Governments Likums „Par pašvaldībām'	June 9, 1994	the Law sets out general provisions and the economic basis for the activities of the local governments (municipalities) of Latvia, the competences of the municipalities; rights and responsibilities of the municipalities, their institutions, heads of cities or county councils; the relations of local governments with the Cabinet of Ministers and ministries, as well as the general provisions regulating relationships among local governments. This Law already provides the legal framework for the cooperation through the contractual relations between municipalities or established authority.
the Law on Carriage by Road Autopārvadājumu likums	September 26, 1995	this law regulates relations between a carrier who performs carriage of passengers and/or goods by road transport vehicles as a professional activity and a consignor, consignee or passengers.
the Public Transport Services Law Sabiedriskā transporta pakalpojumu likums	July 15, 2007	This law specifies: competences of institutions in the PT sector, conditions of PT operations and its organization, the sources of finance and principles of PT financing in the territory of Latvia. On January 1, 2010 the Law had been amended, providing enhanced financial solution for the PT service providers – compensation for losses. The law delegates to the Cabinet of Ministers to define the order, in which the state budget funds are allocated between the planning regions, and limits the competence of municipalities, while increasing responsibility of municipalities for PT services organised according to amount of public resources.
the Law on Railway carriages Dzelzceļa pārvadājumu likums	January 19, 2001	the law mainly regulates all railway carriages (also passenger carriages) and legal relations between the passengers and operators engaged in passenger carriage.
public Procurement law Publisko iepirkumu likums	May 1, 2006	the purpose of this Law is to regulate procurements of the public sector, and to ensure transparency of the procedures, free competition, equal and fair treatment of the applicants as well as effective spending of public finances.

public – Private Partnership Law Publiskās –privātās partnerības likums	October 1, 2009	the purpose of this Law is to facilitate co-operation between the public and private sector, to efficiently use resources of the public and private partner in order to satisfy public needs, ensuring publicity, free competition, equal and fair treatment in the implementation of public-private partnerships. Provisions of this Law are applied to concession contracts and institutional partnerships.
regulations of Cabinet of Ministers No. 673 of October 2, 2007 „Order of organisation of public transport services within the route network' Sabiedriskā transporta pakalpojumu organizēšanas kārtība maršrutu tīklā	January 1, 2008	the regulations state the order for: development of the main and 'outside-main' route network, determination of PT demand and organisation of PT services in the aforementioned route networks. The regulations state that a route network is designed using existing roads, streets and rail network to meet the public's demand for PT. Routes are organized in accordance with the passenger flow, selecting the most direct route between stops/stations.
regulations of Cabinet of Ministers No. 759 of November 23, 2003 „Regulations on state or municipalities' procurements for railway passenger carriages' Noteikumi par valsts vai pašvaldības dzelzceļa pasažieru pārvadājumu pasūtījumiem	January 1, 2004	the regulations determine the order in which state or municipal procurements for passenger carriages by railway should be organized and coordinated. The regulations provide that the responsible authorities for these activities are the Road Transport Administration and city councils.
the Regulations of the Cabinet of Ministers No.1226, of October 26, 2009, „Procedure on setting tariff for compensating losses and expenses incurred by serving public transport services' 26.10.2009. MK not.nr.1226 „ Sabiedriskā transporta pakalpojumu sniegšanā radušos zaudējumu un izdevumu kompensēšanas un sabiedriskā transporta pakalpojuma tarifa noteikšanas kārtība'	November 21, 2009	these Regulations: - contain the procedure for the Road Transport Administration how the state budget funds should be allocated for administration for providing PT; - determine rules for calculating, compensating the losses of the PT service provider and controlling use of it; - determine, calculate and allocate funding from the state budget to planning regions and cities municipalities for compensating the losses of the PT service provider regarding PT service and implementation of minimum quality requirements from state; - the public transport service tariffs.
the Regulation of Cabinet of Ministers No.1614, of December 22, 2009 „Procedure on setting tariff for compensating losses and expenses incurred by serv-	January 1, 2010	this Regulations specifies procedures for the Road Transport Administration, how the government budget should be allocated to the planning regions in order to cover losses of the public service providers providing public transport services within the region.

ing public transport services' 22.12..2009. MK not.nr.1614 „ Noteikumi par valsts budžeta līdzekļu sadalīšanu plānošanas reģioniem sabiedriskā transporta pakalpojumu nodrošināšanai reģionālajos vietējās nozīmes maršrutos'		

table XII.2. Overview of the legal framework for spatial planning

name	in force since	contents/purpose of the document
the State Administration Structure Law	01 January 2003	the legal ground for the institutional system of State administration subordinated to the Cabinet of Ministers and basic provisions regarding the operation of the State administration. See above.
the Law on Local Governments	09 June 1994	the Law sets out the general framework for the competence of the local governments. See above.
the Law on System of Development Planning Attīstības plānošanas sistēmas likums	01 January 2009	the Law determines the system of the development planning in order to promote the sustainable and stable development and improvement of life quality. The Law sets conditions on which it applies to all state institutions and other authorities.
the Regional Development law Reģionālās attīstības likums	23 April 2002	the purpose of this Law is to promote and ensure balanced and sustainable development of the country and to reduce the unfavourable differences between the regions, as well as maintain and develop each area according to its nature and cultural characteristics. The law determines the role of regional authorities- Planning Regions.
the Spatial Planning law Teritorijas plānošanas likums	26 June 2002	the aim of this law - to promote sustainable and balanced development of the country through effective planning system, stating that Spatial planning is a long-term planning document or a set of planning documents. With last amendments on 1 April 2010, the law stipulates that in all planning processes the Sustainable Development Strategy should be taken into account. This law will be replaced after enforcing the new Spatial Planning (January 1, 2011) law.

table XII.3. Overview of the legal framework for roads

name	in force since	contents/purpose of the document
the Law on Roads Par autoceļiem	4 February 1992	the Law regulates the use of roads, their management, protection and development, providing that city streets are the responsibility of the institutions of local municipalities, and their maintenance and use shall be determined by these institutions.
the Road Traffic Law Ceļu satiksmes likums	4 November 1997	the purpose of this Law is: 1) to prescribe the organisational and legal basis for road traffic procedures and road traffic safety in Latvia, 2) to regulate the acquisition of property rights, the rights to hold and to use a vehicle and exploitation rights of motor vehicles, as well as the liability of the owners, holders and users.
regulations of Cabinet of Ministers No. 571 of 29 June 2004 „ Road traffic regulations' Ceļu satiksmes noteikumi	1 July 2004	the regulations prescribe the rules to be followed by participants of the road traffic.
regulations of Cabinet of Ministers No. 173 of 11 March 2008 „Arrangements of spending State budget of the state road fund' Valsts pamatbudžeta valsts autoceļu fonda programmai piešķirto līdzekļu izlietošanas kārtība	March 26, 2008	according to this regulation municipalities have to apply for road funds and MoT (decides on granting of the funds. According to the Regulation, the state road fund program consist of to sub-programs: for the state road management, maintenance and renewal (77.2 % of the program); subsidies for municipalities roads (22,8 % of the program).
the Regulation of the Cabinet of Ministers no 1104, of September 29, 2009 „The List of the state roads and municipalities-owned road sections in the state road network' 29.09.2009. MK noteikumi nr.1104 „Noteikumi par valsts autoceļu un valsts autoceļu maršrutā ietverto pašvaldībām piederošo autoceļu posmu sarakstiem'	October 3, 2010	the decision of the Cabinet of Ministers, which parts of the state roads are transferred to municipalities.

APPENDIX XIII Amendments establishing a PTA

Necessary amendments in the current legislation (analyzed legislation) for implementing the suggested model for Public Transport when establishing the PTA within the Riga Planning Region. The tables in this appendix present the amendments in Latvian. A translation to English is given at the end of the appendix.

table XIII.1. Sabiedriskā transporta pakalpojumu likums/The Public Transport Services Law

pants/article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas26 / Suggested amendments
1. 5)	pasūtītājs — valsts, pašvaldība vai republikas pilsēta, kas savas kompetences ietvaros organizē sabiedriskā transporta pakalpojumus	Izteikt punktu sekojošā redakcijā 'pasūtītājs — valsts vai plānošanas reģions, kas savas kompetences ietvaros organizē sabiedriskā transporta pakalpojumus'.
4. (1)	Valsts pārvaldi sabiedriskā transporta nozarē atbilstoši savai kompetencei īsteno Satiksmes ministrija, plānošanas reģioni un pašvaldības.	Svītrot vārdus ' un pašvaldības'. Jaunā redakcija: 'Valsts pārvaldi sabiedriskā transporta nozarē atbilstoši savai kompetencei īsteno Satiksmes ministrija un plānošanas reģioni.' Faktiski jau šobrīd faktiski PT pakaplojumus īsteno plānošanas reģioni, nevis pašvaldības. Šī brīža izņēmums – republikas pilsētas, kas organizē PT pakalpojumus. Saskaņā ar Pārejas noteikumu 17.punktu, Autotransporta direkcija līdz 2020.gada 31.decembrim sabiedriskā transporta pakalpojumu organizēšanu starppilsētu nozīmes maršrutiem jānodod attiecīgajam plānošanas reģionam.
4.(2)	Satiksmes ministrija, tās institūcijas, plānošanas reģioni un pašvaldības atbilstoši savai kompetencei uzrauga likumu un citu normatīvo aktu ievērošanu sabiedriskā transporta nozarē un organizē sabiedriskā transporta pakalpojumus maršrutu tīklā.	Svītrot vārdus ' un pašvaldības'. Jaunā redakcija: 'Satiksmes ministrija, tās institūcijas un plānošanas reģioni atbilstoši savai kompetencei uzrauga likumu un citu normatīvo aktu ievērošanu sabiedriskā transporta nozarē un organizē sabiedriskā transporta pakalpojumus maršrutu tīklā.'
5.(2) Republikas pilsētas kompetencē ir 1)	pārzināt maršrutu tīkla pilsētas nozīmes maršrutus savā administratīvajā teritorijā;	Svītrot. Minētais pienākums kopā ar PT organizēšanas pienākumu iekļauts plānošanas reģiona kompetncē. Turklāt šis pienākums svītrojams arī no likuma 'Par pašvaldībām', jo jau šobrīd lielākā daļa pašvaldību (izņemot lielās pilsētas) PT organizē plānošanas reģioni, finansē Autotransporta direkcija.
5.(2) Republikas pilsētas kompetencē ir 2)	organizēt sabiedriskā transporta pakalpojumus maršrutu tīkla pilsētas nozīmes maršrutos;	Svītrot. Minētais pienākums kopā ar PT organizēšanas pienākumu iekļauts plānošanas reģiona kompetncē
5.(2) Republikas pilsētas kompetencē	racionāli apsaimniekot no valsts budžeta, pašvaldības budžeta un pašvaldības spe-	Papildināt nosacījumu ar vārdiem 'finansēt plānošanas reģiona organizētos pilsētas teritorijā sniegtos sabiedriskā transporta pakalpojumus un'

[26] Lūdzam ņemt vērā, ka ieteiktās izmaiņas esošajā likumdošanā vērtējumas vienīgi eksperta piedāvātā risinājuma un analizēto spēkā esošo tiesību normu kontekstā

pants/article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas26 / Suggested amendments
ir 4)	ciālā budžeta sabiedriskajam transportam iedalītos finanšu līdzekļus;	Jaunā redakcija: 'finansēt plānošanas reģiona organizētos pilsētas teritorijā sniegtos sabiedriskā transporta pakalpojumus un racionāli apsaimniekot no valsts budžeta, pašvaldības budžeta un pašvaldības speciālā budžeta sabiedriskajam transportam iedalītos finanšu līdzekļus'.
5. (3) Plānošanas reģiona kompetencē ir 1)	pašvaldību interesēs pārzināt maršrutu tīkla reģionālos vietējās nozīmes maršrutus, tai skaitā tos reģionālos vietējās nozīmes maršrutus, kas nodrošina pārvietošanos novadā ietilpstošo pilsētu teritorijās, atbilstoši valsts budžetā sabiedriskā transporta pakalpojumu nodrošināšanai paredzētajiem līdzekļiem pēc saskaņošanas ar attiecīgo pašvaldību un Autotransporta direkciju;	Izteikt sekojošā redakcijā: 'pašvaldību (tostarp republikas pilsētu) interesēs pārzināt maršrutu tīkla reģionālos vietējās nozīmes maršrutus, tai skaitā tos reģionālos vietējās nozīmes maršrutus, kas nodrošina pārvietošanos novadā ietilpstošo pilsētu un republikas pilsētu teritorijās, atbilstoši valsts budžetā sabiedriskā transporta pakalpojumu nodrošināšanai paredzētajiem līdzekļiem pēc saskaņošanas ar attiecīgo pašvaldību un Autotransporta direkciju'.
5. (3) Plānošanas reģiona kompetencē ir 2)	pašvaldību interesēs organizēt sabiedriskā transporta pakalpojumus maršrutu tīkla reģionālajos vietējās nozīmes maršrutos, tai skaitā tajos reģionālajos vietējās nozīmes maršrutos, kas nodrošina pārvietošanos novadā ietilpstošo pilsētu teritorijās, atbilstoši valsts budžetā sabiedriskā transporta pakalpojumu nodrošināšanai paredzētajiem līdzekļiem pēc saskaņošanas ar attiecīgo pašvaldību un Autotransporta direkciju	Papildināt punktu, izsakot to sekojošā redakcijā: 'pašvaldību (tostarp republikas pilsētu) interesēs organizēt sabiedriskā transporta pakalpojumus maršrutu tīkla reģionālajos vietējās nozīmes maršrutos, tai skaitā tajos reģionālajos vietējās nozīmes maršrutos, kas nodrošina pārvietošanos novadā ietilpstošo pilsētu un republikas pilsētu teritorijās, atbilstoši valsts budžetā sabiedriskā transporta pakalpojumu nodrošināšanai paredzētajiem līdzekļiem pēc saskaņošanas ar attiecīgo pašvaldību un Autotransporta direkciju'.
5. (3) Plānošanas reģiona kompetencē ir 5)	sniegt priekšlikumus Autotransporta direkcijai un republikas pilsētas pašvaldībai par sabiedriskā transporta pakalpojumu organizēšanu to kompetencē esošajā maršrutu tīklā;	Svītrot vārdus 'un republikas pilsētas pašvaldībai'. Likuma 5.panta otrajā daļā noteikts, ka republikas pilsētas kompetencē ir sniegt priekšlikumus Autotransporta direkcijai vai plānošanas reģionam par sabiedriskā transporta pakalpojumu organizēšanu to kompetencē esošajā maršrutu tīklā.
6. (9)	Organizējot sabiedriskā transporta pakalpojumus vienas administratīvās teritorijas robežās ārpus pilsētas, prioritāri ir maršrutu tīkla reģionālie starppilsētu nozīmes maršruti, ja reģionālais vietējās nozīmes maršruts pilnībā vai vairāk nekā 70 procenti no tā kopgaruma	Izteikt sekojošā redakcijā: 'Organizējot sabiedriskā transporta pakalpojumus viena administratīvā reģiona teritorijas robežās, prioritāri ir maršrutu tīkla pilsētas nozīmes maršruti un reģionālie starppilsētu nozīmes maršruti, ja reģionālais vietējās nozīmes maršruts pilnībā vai vairāk nekā 70 procenti no tā kopgaruma sakrīt ar daļu no reģionālā starppilsētu nozīmes maršruta.'

pants/article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas26 / Suggested amendments
	sakrīt ar daļu no reģionālā starppilsētu nozīmes maršruta, kā arī moršrutu tīkla pilsētās.	
11. (2)	pašvaldībām no valsts budžeta nosaka un aprēķina finansējumu zaudējumu kompensēšanai pārvadātājiem, kā arī pašvaldībām no valsts budžeta piešķir finansējumu zaudējumu kompensēšanai pārvadājumos, kas saistīti ar sabiedriskā transporta pakalpojumu sniegšanu, un kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību;	Aizvietot vārdus 'pašvaldības' ar vārdiem 'plānošanas reģioni'. Jaunā redakcija: 'plānošanas reģioniem no valsts budžeta nosaka un aprēķina finansējumu zaudējumu kompensēšanai pārvadātājiem, kā arī plānošanas reģioniem no valsts budžeta piešķir finansējumu zaudējumu kompensēšanai pārvadājumos, kas saistīti ar sabiedriskā transporta pakalpojumu sniegšanu, un kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību' Šobrīd zaudējumu kompensēšanas kārtību nosaka 26.10.2009. MK noteikumi nr.1226 'Sabiedriskā transporta pakalpojumu sniegšanā radušos zaudējumu un izdevumu kompensēšanas un sabiedriskā transporta pakalpojuma tarifa noteikšanas kārtība', kuri būtu jāgoza, nosakot plānošanas reģiona nozīmi kompensācijas shēmā.
12. (3)	Kārtību, kādā nosaka, aprēķina un pārvadātājam kompensē šā panta pirmajā daļā minētos izdevumus un piešķir pašvaldībām finansējumu no valsts budžeta šā panta pirmajā daļā minēto izdevumu segšanai, kā arī kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību, nosaka Ministru kabinets.	Aizvietot vārdus 'pašvaldības' ar vārdiem 'plānošanas reģioni'. Jaunā redakcija: 'Kārtību, kādā nosaka, aprēķina un pārvadātājam kompensē šā panta pirmajā daļā minētos izdevumus un piešķir plānošanas reģioniem finansējumu no valsts budžeta šā panta pirmajā daļā minēto izdevumu segšanai, kā arī kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību, nosaka Ministru kabinets.'
15.	Papildus šā likuma 3.panta trešajā daļā minētajā regulā, Publisko iepirkumu likumā vai likumā, kas reglamentē koncesiju piešķiršanu, un citos sabiedriskā transporta pakalpojumu nozari reglamentējošos normatīvajos aktos noteiktajam sabiedriskā transporta pakalpojumu pasūtījuma līgumā var paredzēt:	Aizstāt vārdus 'likumā, kas reglamentē koncesiju piešķiršanu' ar vārdiem 'Publiskās un privātās partnerības likumā'. Jaunā redakcija: 'Papildus šā likuma 3.panta trešajā daļā minētajā regulā, Publisko iepirkumu likumā vai Publiskās un privātās partnerības likumā un citos sabiedriskā transporta pakalpojumu nozari reglamentējošos normatīvajos aktos noteiktajam sabiedriskā transporta pakalpojumu pasūtījuma līgumā var paredzēt' No 2009.gada 1.oktobra koncesiju piešķiršanas kārtību nosaka Publiskās un privātās partnerības likums.

26.10.2009. MK not.nr.1226
'Sabiedriskā transporta pakalpojumu sniegšanā radušos zaudējumu un izdevumu kompensēšanas un sabiedriskā transporta pakalpojuma tarifa noteikšanas kārtība'
/ The Regulations of the Cabinet of Ministers No.1226, of October 26, 2009
'Procedure on setting tariff for compensating losses and expenses incurred by serving public transport services'

punkts/article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas27 / Suggested amendments
1.3.	pašvaldībām nosaka un aprēķina finansējumu no valsts budžeta pārvadātāju zaudējumu kompensēšanai, piešķir finansējumu no valsts budžeta, lai pašvaldības varētu kompensēt pārvadātājam ar sabiedriskā transporta pakalpojumu sniegšanu saistītos zaudējumus, kā arī kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību;	Aizvietot vārdus 'pašvaldības' ar vārdiem 'plānošanas reģioni'. Jaunā redakcija: 'plānošanas reģioniem nosaka un aprēķina finansējumu no valsts budžeta pārvadātāju zaudējumu kompensēšanai, piešķir finansējumu no valsts budžeta, lai plānošanas reģioni varētu kompensēt pārvadātājam ar sabiedriskā transporta pakalpojumu sniegšanu saistītos zaudējumus, kā arī kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību
1.4.	nosaka, aprēķina un kompensē pārvadātājam ar valsts noteikto minimālo kvalitātes prasību ieviešanu saistītos izdevumus un piešķir pašvaldībām a'finansējumu no valsts budžeta, lai tās varētu kompensēt pārvadātājam ar valsts noteikto minimālo kvalitātes prasību ieviešanu saistītos izdevumus, kā arī kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību;	Aizvietot vārdus 'pašvaldības' ar vārdiem 'plānošanas reģioni'. Jaunā redakcija: 'nosaka, aprēķina un kompensē pārvadātājam ar valsts noteikto minimālo kvalitātes prasību ieviešanu saistītos izdevumus un piešķir plānošanas reģioniem finansējumu no valsts budžeta, lai tie varētu kompensēt pārvadātājam ar valsts noteikto minimālo kvalitātes prasību ieviešanu saistītos izdevumus, kā arī kontrolē šo līdzekļu izmantošanas tiesiskumu un pareizību
43.1.2.	republikas pilsētas pašvaldībai – katru ceturksni līdz ceturkšņa pirmā mēneša desmitajam datumam;	Svītrot
43.2.	republikas pilsētas pašvaldība un plānošanas reģions – pārvadātājam – katru mēnesi līdz piecpadsmitajam datumam.	Svītrot vārdus 'republikas pilsētas pašvaldība un' Jaunā redakcija: 'plānošanas reģions – pārvadātājam – katru mēnesi līdz piecpadsmitajam datumam.'
53.1.	Satiksmes ministrija – pārvadātājam, republikas pilsētas pašvaldībai un plānošanas reģionam līdz pārskata periodam (ceturksnim) sekojošā trešā mēneša desmitajam datumam;	Svītrot vārdus 'republikas pilsētas pašvaldība un' Jaunā redakcija: 'Satiksmes ministrija – pārvadātājam un plānošanas reģionam līdz pārskata periodam (ceturksnim) sekojošā trešā mēneša desmitajam datumam'
53.2.	republikas pilsētas pašvaldība	Svītrot vārdus 'republikas pilsētas pašvaldība un'

[27] Lūdzam ņemt vērā, ka ieteiktās izmaiņas esošajā likumdošanā vērtējumas vienīgi eksperta piedāvātā risinājuma un analizēto spēkā esošo tiesību normu kontekstā.

punkts/article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas27 / Suggested amendments
	un plānošanas reģions – pārvadātājam līdz pārskata periodam (ceturksnim) sekojošā trešā mēneša piecpadsmitajam datumam;	Jaunā redakcija: 'plānošanas reģions – pārvadātājam līdz pārskata periodam (ceturksnim) sekojošā trešā mēneša piecpadsmitajam datumam'
53.3.	Satiksmes ministrija, republikas pilsētas pašvaldība un plānošanas reģions – pārvadātājam par pārskata gadu 30 dienu laikā.	Svītrot vārdus 'republikas pilsētas pašvaldība'. Jaunā redakcijs: 'Satiksmes ministrija un plānošanas reģions – pārvadātājam par pārskata gadu 30 dienu laikā.
66.	Autotransporta direkcijai ir tiesības iepazīties ar republikas pilsētas pašvaldībās un plānošanas reģionos veikto kompensāciju aprēķināšanas kārtību un sabiedriskā transporta pakalpojumu organizēšanas kārtību, piekļūt dokumentiem un pieprasīt atbildīgo darbinieku paskaidrojumus.	Svītrot vārdus 'republikas pilsētas pašvaldība un' Jaunā redakcija: 'Autotransporta direkcijai ir tiesības iepazīties ar plānošanas reģionos veikto kompensāciju aprēķināšanas kārtību un sabiedriskā transporta pakalpojumu organizēšanas kārtību, piekļūt dokumentiem un pieprasīt atbildīgo darbinieku paskaidrojumus.'

table XIII.2. Likums 'Par pašvaldībām'/The Law on municipalities

pants/article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas28 / Suggested amendments
15. 19)	organizēt sabiedriskā transporta pakalpojumus;	Svītrot. Skatīt komentāru pie Sabiedriskā transporta pakalpojuma likuma 5.panta trešās daļas 5.punkta.

[28] Lūdzam ņemt vērā, ka ieteiktās izmaiņas esošajā likumdošanā vērtējumas vienīgi eksperta piedāvātā risinājuma un analizēto spēkā esošo tiesību normu kontekstā.

Translated tables

table XIII.1. The Public Transport Services Law (*Sabiedriskā transporta pakalpojumu likums*)

Article	Current regulation	Suggested amendments29 /
1. 5)	Contracting authority - the State, a municipality or a republic city, which organises public transport services within the competence thereof.	To express the provision in the following wording: Contracting authority — the State or a planning region, which organises public transport services within the competence thereof.
4. (1)	The State administration in the public transport sector is implemented by the Ministry of Transport, planning regions and municipalities according to the competence thereof.	To cross out words: 'and municipalities'. New wording: 'State administration in the public transport sector is implemented by the Ministry of Transport and planning regions according to the competence thereof.' In fact already now PT services are implemented by planning regions, not municipalities. Exception at the moment – cities of republic, which organise PT services. In accordance with Article 17 of the Transitional provisions, the Road Transport Administration must transfer organisation of public transport services, in routes of inter-city importance, to respective planning region by 31 December 2020.
4.(2)	The Ministry of Transport, its institutions, planning regions and municipalities in accordance with their competence monitor the observance of laws and other legal acts in the public transport sector and organise public transport services in the route network.	To cross out words: 'and municipalities'. New wording: 'The Ministry of Transport, its institutions and planning regions in accordance with their competence monitor the observance of laws and other legal acts in the public transport sector and organise public transport services in the route network.'
5.(2) The competence of a republic city includes: 1)	managing routes of city significance of the route network within its administrative territory;	To cross out. The aforementioned duty together with the duty of PT organisation has been included in the competence of a planning region. Moreover, this duty has to be crossed out also from the law on Municipalities, as already now in most municipalities (except for the big cities) PT is organised by planning regions, financed by Road Transport Administration.
5.(2) The competence of a republic city includes 2)	the organisation of public transport services in the routes of city significance of the route network;	To cross out. The aforementioned duty together with the duty of PT organisation has been included in the competence of a planning region.

[29] Please be aware that proposed amendments in current legislation are to be viewed only in the context of the solution proposed by the expert and the analysed legal norms in force at the time.

Article	Current regulation	Suggested amendments29 /
5.(2) The competence of a republic city includes 4)	the rational management of the financial resources allocated for public transport from the State budget, municipality budget and special budget of a municipality;	To supplement the provision with words: 'financing of public transportation services organised by planning region and provided within a city's territory and' New wording: 'financing of public transportation services organised by planning region and provided within a city's territory and the rational management of the financial resources allocated for public transport from the State budget, municipality budget and special budget of a municipality'.
5. (3) The competence of a planning region includes 1)	the management of regional routes of local significance of a route network in the interests of municipalities, including those regional routes of local significance, which ensure moving within the territories of cities included in a district, pursuant to the resources provided for in the State budget for the provision of public transport services after co-ordination with the relevant municipality and the Road Transport Administration;	To express in the following wording: 'the management of regional routes of local significance of a route network in the interests of municipalities (among them republic cities), including those regional routes of local significance, which ensure moving within the territories of republic cities and cities included in a district, pursuant to the resources provided for in the State budget for the provision of public transport services after co-ordination with the relevant municipality and the Road Transport Administration'.
5. (3) The competence of a planning region includes 2)	the organisation of public transport services in regional routes of local significance of a route network in the interests of municipalities, including those regional routes of local significance, which ensure moving within the territories of cities included in a district, pursuant to the resources intended in the State budget for the provision of public transport services after co-ordination with the relevant municipality and the Road Transport Administration	To supplement the provision by expressing it in the following wording: 'the organisation of public transport services in regional routes of local significance of a route network in the interests of municipalities (among them republic cities), including those regional routes of local significance, which ensure moving within the territories of republic cities and cities included in a district, pursuant to the resources intended in the State budget for the provision of public transport services after co-ordination with the relevant municipality and the Road Transport Administration'.
5. (3) The competence of a planning region includes 5)	the provision of proposals to the Road Transport Administration and a municipality of republic city regarding the organisation of public transport services within route network under the competence thereof;	To cross out words: 'and a municipality of republic city' Part 2 of Article 5 of the said law provides that the competence of city republic includes provision of proposals to the Road Transport Administration or a planning region regarding the organisation of public transport services within the route network under the competence thereof;
6. (9)	When organising public transport services within the boundaries of	To express it in the following wording: 'When organising public transport services within

Article	Current regulation	Suggested amendments29 /
	one administrative territory outside a city, the regional routes of inter-city significance of a route network are of priority, if the regional route of local significance completely or by more than 70 per cent of its total length matches with the part of the regional route of inter-city significance, as well as route network in cities.	the boundaries of the territory of one administrative region, the routes of city significance and regional routes of inter-city significance of a route network are of priority, if the regional route of local significance completely or by more than 70 per cent of its total length matches with the part of the regional route of inter-city significance'
11. (2)	financing from the State budget is determined and calculated for municipalities for reimbursement of losses for carriers, as well as the financing from the State budget is granted to municipalities for reimbursement of losses in the carriage related to the provision of public transport services, and the legality and correctness of the use of these resources is controlled;	To substitute the word 'municipalities' with words 'planning regions' New wording: 'financing from the State budget is determined and calculated for planning regions for reimbursement of losses for carriers, as well as the financing from the State budget is granted to planning regions for reimbursement of losses in the carriage related to the provision of public transport services, and the legality and correctness of the use of these resources is controlled' Currently the procedure for compensation losses is set by Regulations of Cabinet on Minister No 1226 of 26.10.2009. 'Procedure on setting tariff for compensating losses and expenses incurred by serving public transport services', which will have to be amended, providing for the significance of planning regions in the scheme.
12. (3)	The procedures for the determination, calculation and reimbursement of the expenditures referred to in Paragraph one of this Article to the carrier and for granting of the financing from the State budget to municipalities for covering of the expenditures referred to in Paragraph one of this Article, as well as for control of the legality and correctness of the use of these resources is determined by the Cabinet of Ministers.	To substitute the word 'municipalities' with words 'planning regions'. New wording: 'The procedures for the determination, calculation and reimbursement of the expenditures referred to in Paragraph one of this Article to the carrier and for granting of the financing from the State budget to planning regions for covering of the expenditures referred to in Paragraph one of this Article, as well as for control of the legality and correctness of the use of these resources is determined by the Cabinet of Ministers.'
15.	In addition to the provisions specified in the Regulation, referred to in part 3 of Article 3 of this Law, the Public Procurement Law or in the law, which regulates the granting of concessions, and in other legal acts regulating the sector of public	To substitute words: 'law, which regulates the granting of concessions' with words: 'Public and Private partnership law' New wording: 'In addition to the provisions specified in the Regulation, referred to in part 3 of Article 3 of this Law, the Public Procurement Law or

Article	Current regulation	Suggested amendments29 /
	transport services, the following may be provided for in the order contract of public transport services:	in the Public and Private partnership law, and in other legal acts regulating the sector of public transport services, the following may be provided for in the order contract of public transport services:' As of 1 October 2009 the procedure for granting concessions is set by the Public and Private partnership law.

The Regulations of the Cabinet of Ministers No.1226, of October 26, 2009
'Procedure on setting tariff for compensating losses and expenses incurred by serving public transport services' („Sabiedriskā transporta pakalpojumu sniegšanā radušos zaudējumu un izdevumu kompensēšanas un sabiedriskā transporta pakalpojuma tarifa noteikšanas kārtība")

Article	Current regulation	Suggested amendments 30
1.3.	financing from the State budget is determined and calculated for municipalities for reimbursement of losses of carriers, financing from the State budget is granted in order for the municipalities to be able to reimburse to a carrier losses related to the provision of public transport services, as well as the legality and correctness of the use of these resources is controlled.	To substitute the word 'municipalities' with words 'planning regions': New wording: 'financing from the State budget is determined and calculated for planning regions for reimbursement of losses of carriers, financing from the State budget is granted in order for the planning regions to be able to reimburse to a carrier losses related to the provision of public transport services, as well as the legality and correctness of the use of these resources is controlled.'
1.4.	expenses related to implementation of minimum quality requirements set by the state are determined, calculated and reimbursed to a carrier and financing from the State budget is granted to municipalities in order for them to be able to reimburse to a carrier expenses related to implementation of minimum quality requirements set by the state, as well as the legality and correctness of the use of these resources is controlled.	To substitute the word 'municipalities' with words 'planning regions': New wording: 'implementation of minimum quality requirements set by the state are determined, calculated and reimbursed to a carrier and financing from the State budget is granted to planning regions in order for them to be able to reimburse to a carrier expenses related to implementation of minimum quality requirements set by the state, as well as the legality and correctness of the use of these resources is controlled'
43.1.2.	to a municipality of a republic city – every quarter by the tenth date of the first month of the quarter;	To cross out.
43.2.	a municipality of a republic city and	Cross out words 'a municipality of a republic city

[30] Please be aware that proposed amendments in current legislation are to be viewed only in the context of the solution proposed by the expert and the analysed legal norms in force at the time.

Article	Current regulation	Suggested amendments 30
	a planning region – to a carrier – every month by the fifteenth date.	and' New wording: 'a planning region – to a carrier – every month by fifteenth date.'
53.1.	the Ministry of Transport – to a carrier, to a municipality of republic city and to a planning region by the tenth date of the third month following a reporting period (quarter)	To cross out words 'a municipality of a republic city' New wording: 'Ministry of Transport – to a carrier, and to a planning region by the tenth date of the third month following a reporting period (quarter)'
53.2.	a municipality of a republic city and a planning region – to a carrier by the fifteenth date of the third month following a reporting period (quarter);	To cross out words 'a municipality of a republic city and' New wording: 'a planning region – to a carrier by the fifteenth date of the third month following a reporting period (quarter)'
53.3.	Ministry of Transport, a municipality of a republic city and a planning region – to a carrier for the reporting year, within 30 days.	To cross out words 'a municipality of a republic city'. New wording: 'Ministry of Transport and a planning region – to a carrier for the reporting year, within 30 days.'
66.	Road Transport Administration has the right to familiarise itself with procedure of calculation of reimbursements performed in municipalities of cities and planning regions and procedure for organisation of public transport services, access documents and request explanations of the responsible employees.	To cross out words 'a municipality of a city and'. New wording: 'Road Transport Administration has the right to familiarise itself with procedure of calculation of reimbursements performed in planning regions and procedure for organisation of public transport services, access documents and request explanations of the responsible employees.'

Table XIII.2. The Law on municipalities (*Likums 'Par pašvaldībām'*)

Article	Current regulation	Suggested amendments 31 /
15. 19)	organize public transport services;	To cross out. Please refer to the commentary at the point 5 of part 3 of Article 5 of The Public Transport Services Law.

31 Please be aware that proposed amendments in current legislation are to be viewed only in the context of the solution proposed by the expert and the analysed legal norms in force at the time.

APPENDIX XIV Amendments to the draft law on spatial planning

Necessary amendments in the current and draft legislation (analyzed legislation) for implementing the suggested model for Planning. Tables are presented in Latvian in this appendix. Translated tables are included at the end of the appendix.

table XIV.1. Reģionālās attīstības likums/The Regional Development Law

Pants/ Article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas32 / Suggested amendments
16.1 Plānošanas reģiona kompetence		Papildināt pantu ar jaunu punktu: 'sadarībā ar kompetentajām valsts iestādēm ierosina vai izstrādā reģiona pašvaldību vajadzībām, plānošanas reģiona attīstības programmai un teritorijas plānojumam atbilstošu publiskā transporta maršrutu tīklu'
16.1 Plānošanas reģiona kompetence		Papildināt pantu ar jaunu punktu: 'sadarbībā ar pašvaldībām un valsts iestādēm nodrošina publiskā transporta pakalpojumus attiecīgajā reģionā'

table XIV.2. Teritoriālās attīstības plānošanas likuma projekts33/draft of the Spatial Planning Law

pants/ article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas/ Suggested amendments
10. (1)	Nozaru ministrijas sagatavo priekšlikumus valsts interešu teritoriju noteikšanai, ja nepieciešams, izstrādā tematiskos plānojumus	Papildināt ar teikumu: 'Par transporta infrastruktūras attīstības plānošanu atbildīgā nozares ministrija papildina par teritorijas attīstības plānošanu atbildīgās ministrijas izstrādātos dokumentus saistībā ar transporta infrastruktūras plānotajiem attīstības pasākumiem'. Lai an šībrīža likuma projekta redakcija paredz nozares ministriju līdzdarbību plānojumu izstrādē. Tomēr piecāvātie papildinājumi akcentētu satiksmes ministrijas kā atbildīgās par transporta infrastruktūras pasākumiem plānoto aktivitāšu iestrādi RAPLM izstrādātajos dokumentos. Likums 'Par autoceļiem' 11.panta pirmā daļa nosaka, ka autoceļu attīstību plāno Latvijas Republikas Satiksmes ministrija, ievērojot ekonomiskās, ekoloģiskās un sociālās attīstības tendences, valsts un pašvaldību intereses un par pamatu izvirzot reģionu vienlīdzīgas attīstības principu. Savukārt esošais autoceļu tīkls ir bāze transporta infrastruktūras plānošanai, līdz ar to arī teritorijas plānošanai.

32 Lūdzam ņemt vērā, ka ieteiktās izmaiņas esošajā likumdošanā vērtējumas vienīgi eksperta piedāvātā risinājuma un analizēto spēkā esošo tiesību normu kontekstā.

33 Ņemot vērā dokumenta projektu, kas izsludināts VSS: http://www.mk.gov.lv/lv/mk/tap/?dateFrom=2009-06-01&dateTo=2010-06-01&text=VSS-159&org=0&area=0&type=0.

translated tables

table XIV.1. The Regional Development Law (*Reģionālās attīstības likums*)

Article	Current regulation	Suggested amendments [34] /
16.1 Competence of a Planning Region		Supplement with a new point: 'In cooperation with the competent state institutions proposes or develops, for the needs of municipalities of the region, a public transport route network corresponding to the development programme and the spatial planning of the planning region.'
16.1 Competence of a Planning Region		Supplement the Article with a new point: 'In cooperation with the municipalities and state institutions ensures public transport services in the respective region'

Table XIV.2 draft of the Spatial Development Planning Law [35] *(Teritoriālās attīstības plānošanas likuma projekts)*

Article	Current regulation	Suggested amendments
10. (1)	Sectoral ministries prepare proposals for determination of territories of state interests, if necessary, by developing thematical plannings	To supplement with a sentence: 'The sectoral Ministry responsible for the planning of development of transport's infrastructure supplements documents, drafted by the Ministry responsible for the planning of spatial development, in relation to the planned development measures of transport's infrastructure'. Although current wording of the draft legislation provides for cooperation of sectoral ministries in the development of the planning, the proposed supplements would stress the Ministry of Transport as the responsible for incorporation of planed activities for the measures of transport's infrastructure in the documents drawn up by The Ministry of Regional Development and Local Government of the Republic of Latvia. Part one of Article 11 of the Road Law provides that development of roads is planned by Ministry of Transport of Republic of Latvia, taking into consideration tendencies of economical, ecological and social development, state and municipality interests and by setting as the foundation principle of equal development of the regions. Whereas current road network is the basis for planning transport's infrastructure, and therefore also for spatial planning.

34 Please be aware that proposed amendments in current legislation are to be viewed only in the context of the solution proposed by the expert and the analysed legal norms in force at the time.

35 Please take into consideration the project of the document announced in SSM: http://www.mk.gov.lv/lv/mk/tap/?dateFrom=2009-06-01&dateTo=2010-06-01&text=VSS-159&org=0&area=0&type=0 .

APPENDIX XV Amendments to the road law

Necessary amendments in the current (analyzed legislation) for implementing the suggested model for maintenance and construction of roads. The tables in this appendix are given in Latvian, a translation is given at the end of the appendix.

table XV.1. Autoceļu likums / the Road Law

pants/ article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas36 / Suggested amendments
(11)	Atsevišķos gadījumos ar Ministru kabineta lēmumu valsts autoceļus, izņemot valsts galvenos autoceļus un to zemes, tai skaitā ceļu zemes nodalījumu joslas, ar visām šo autoceļu kompleksā ietilpstošajām būvēm var nodot pašvaldību pārziņā.	Papildināt pantu ar teikumu: 'Minētais noteikums nav attiecināms uz 3.panta trešās daļas 1.punktā noteiktajiem galvenajiem autoceļiem.' Šī panta pirmā daļa paredz, ka valsts autoceļi ar visām to kompleksā ietilpstošajām būvēm ir LR īpašums, kas nodots Latvijas Valsts ceļi pārziņā un attiecībā uz galvenajiem autoceļiem (kas valsts autoceļu tīklu savieno ar citu valstu galvenās nozīmes autoceļu tīklu un galvaspilsētu — ar pārējām republikas pilsētām vai kas ir republikas pilsētu apvedceļi) nevajadzētu nodot šīs tiesības pašvaldībai, lai saglabātu valsts nozīmes ceļu kvalitāti visā ceļa posmā. Lai gan patreizējā norma paredz, ka tikai atsevišķos gadījumos autoceļi var tikt nodoti pašvaldībai, Rīgas un Pierīgas reģionā tie nav atsevišķi gadījumi.

29.09.2009. MK noteikumi nr.1104
'Noteikumi par valsts autoceļu un valsts autoceļu maršrutā ietverto pašvaldībām piederošo autoceļu posmu sarakstiem'

The List of the state roads and municipalities-owned road sections in the state road network

Pants/ Article	Patreizējais regulējums/ current regulation	Piedāvātās izmaiņas/ Suggested amendments
Minētais dokuments ir grozāms, izslēdzot valsts galveno autoceļu posmus no saraksta.		

[36] Lūdzam ņemt vērā, ka ieteiktās izmaiņas esošajā likumdošanā vērtējumas vienīgi eksperta piedāvātā risinājuma un analizēto spēkā esošo tiesību normu kontekstā.

Table XV.1. the Road Law (*Autoceļu likums*)

Article	Current regulation	Suggested amendments 37
(11)	On separate occasions state roads, except for the main state roads and their lands, including land separation lanes of the roads, with all buildings falling within road complex can be transferred in the management of municipalities by a decision of Cabinet of Ministers.	To supplement the Article with a sentence: 'The said provision is not applicable towards the State's main roads provided in point 1 of part 3 of Article 3.' First part of this article provides that state roads with all the building falling within complex of the said roads is property of Republic of Latvia, which has been transferred in the management of Latvian State Roads. And in respect of main roads (which connect the state road network with the main road networks of other countries and capital – with other republic cities, or which are bypasses of republic cities) these rights should not be transferred to municipality, in order to maintain quality of roads of state importance. In whole road section. Although current provision provides, that on separate occasions roads can be transferred to municipality in the region of Riga and Pieriga these are not 'separate' occasions.

The Regulations of the Cabinet of Ministers No.1104, of September 29, 2009
On the lists of the state roads and municipality-owned road sections included in the route of state roads (Noteikumi par valsts autoceļu un valsts autoceļu maršrutā ietverto pašvaldībām piederošo autoceļu posmu sarakstiem)

Article	Current regulation	Suggested amendments
The said document must be amended by excluding sections of the state's main roads from the list.		

37 Please be aware that proposed amendments in current legislation are to be viewed only in the context of the solution proposed by the expert and the analysed legal norms in force at the time.

APPENDIX XVI Loan and liability information

The NIB, EBRD and EIB are the three main international financing institutions for Latvia.

Nordic Investment Bank
International financial institution of the Nordic and Baltic countries. The NIB finances projects that strengthen competitiveness and enhance the environment. The Bank offers long-term loans and guarantees on competitive market terms to its clients in the private and public sectors. NIB focuses in particular on four sectors:

- energy;
- the environment;
- transport, logistics and communications;
- innovation.

Projects considered for financing are viewed from a sustainable growth perspective. NIB analyses both their direct and indirect impact on competitiveness and the environment. NIB is an international financial institution owned by Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden. The Bank has lending operations both in and outside its member countries. NIB acquires the funds for its lending by borrowing on the international capital markets. NIBs bonds enjoy the highest possible credit rating.

EBRD
The EBRD uses the tools of investment to help build market economies and democracies in countries from central Europe to central Asia. The EBRD is the largest single investor in its region of operations and mobilises significant foreign direct investment beyond its own financing. It is owned by 61 countries and two intergovernmental institutions: the EIB and the EU. But despite its public sector shareholders, it invests mainly in private enterprises, usually together with commercial partners. According to its mandate the EBRD only works in countries that are committed to democratic principles and EBRD investments must be based on respect for the environment. The objectives of EBRD investments must support transition, i.e. help move a country closer to a full market economy. The strategy of the EBRD is to deepen and broaden the role of the private sector in the economy. Only in exceptional cases the EBRD will rely on state guarantees to underpin the projects.

The EBRD has a few particular focuses in its investment policy, among which: infrastructure and energy, particularly through transfer to private ownership and commercialisation of energy utilities; to support municipal clients of making use of EU funding and to develop public and private partnerships; to support commercialisation in the transport sector and explore ways to increase opportunities where state guarantees are not required. From the year 2000 the EBRD invested a total value of MEUR 927 in Latvia in 32 different projects.

EIB
The EIB provides loans for projects of EU interest, such as rail and road connections, airports or environmental projects. About 90 % of the loans are offered to EU nations. When giving loans for less prosperous regions, candidate member states and for developing countries, this is done in combination with EC Structural Funds. The EIB is financed from loans on the capital market and by the shareholders of the bank being the member states of the EU and is the largest investor in the EU. The projects in which the EIB invests are carefully selected on the basis of the following criteria: help to achieve the EU objectives, such as improvement of the competitive power of the European industries and the small and medium sized enterprises (SMEs); realisation of Trans-European Networks (transport, telecommunication and energy); promotion of information technology; protection of natural and urban environments; improvement of health care and education; stimulate the least favoured regions; help to attract other financing sources. In the past five years the EIB has provided loans in Latvia with a total value of MEUR 943 of which MEUR 610 in 2008.

Table XVI.1 presents the laws and regulation in Latvia in relation to loans, PPP's and other liabilities.

table XVI.1. Laws, regulations and guidelines in relation to loans, PPP's and other liabilities for the Latvian public authorities and for municipalities in particular

PPP related guidelines	**Latvian Laws and Regulations**
the long term liabilities of state basic and special budgets includes a breakdown of PPP liabilities for investment projects	regulations of the Cabinet of Ministers of the Republic of Latvia 'Regulations on elaboration principles of budget elaboration and submission' of 3 October 2009
the Latvian government intends not to undertake implementation of new PPP projects except concessions where general government does not undertake any risks or liabilities. It can not be excluded that such decision is also made for 2011.	letter of the Latvian government to the International Monetary Fund of 22 January 2010
municipalities are obliged to submit monthly progress reports, including among others municipal liabilities such as loans, guarantees and long term liabilities resulting from PPP projects.	regulation of the Cabinet of Ministers of the Republic of Latvia No 313 'Regulations on contents, elaboration and submission order of municipal financial monthly reports' of 25 April 2006
municipalities can undertake long term liabilities only for strategically important infrastructure projects which are co-financed by European Union or other external financial assistance and PPP projects.	Clause 14 of the Law on State Budget for 2010. A procedure to undertake such long term liabilities is set forth in Regulations of the Cabinet of Ministers and approval is needed from the Minister of Finance. which are approved in accordance with procedures set forth in the Law on Public and Private Partnership provides procedures relevant to PPP
municipalities, loans and other liabilities	
the State Treasury can issue loans to municipalities, other public bodies and business entities [38] etc.. Loans are issued in the framework of the borrowing limit, which is set forth in the annual budget law.	Clause 35, Part 5 of the Law on Budget and Financial Management
municipalities are eligible to borrow funds for implementation of infrastructure projects financed by EU and other external financial assistance in 2010, provided that municipal co-financing is no less than 90 % and the required loan amount does not exceed 10 % of total project costs.	Clause 14 of the Law on State Budget for 2010 municipalities
decisions on allowable loan amounts are made by the Monitoring and control committee of municipal loans and guarantees (Minister of Finance).	the allowed annual amount of municipal loans and guarantees is set forth in the. law on state budget.
national legal acts allow Riga City Council to borrow until the ceiling of 100 % from annual Riga City budget. The Minister of Finance is allowed to issue a loan or a guarantee even in cases if total liabilities of a municipality exceeds 20 % of annual budget revenues for co-financing of EU projects [39]	Clause 14 of the Law on State Budget for 2010

[38] where a total municipal share in equity exceeds 65 %.

[39] minus state categorised subsidies and contributions to the Municipal financial equalisation fund.

APPENDIX XVII PPP road projects

The information presented in this appendix is mainly based on the following recent studies:

- capital markets in PPP financing, where we were and where we are we going. EPEC (European PPP expertise centre - a collaboration between EIB, EU and other partners), April 2010;
- the financial crisis and the PPP market - potential remediation actions. EPEC, August 2009;
- mobilising private and public investment- for recovery and long-term structural changes: developing public-private partnerships. Commission of the European communities, November 2009;
- the Swedish model for PPP in infrastructure investment, summary of a report drawn up by a joint Working group from Banverket, VTI, and the SRA, 2008.

basic characteristics of recent PPP road projects

In PPP road projects design and construction is usually financed by the project company raising a loan. Loan repayments begin when the facility opens and continue during the operational period using funds paid by the state as payment for the service. This has two important consequences:

- incentives for an early traffic opening are strong, with the resulting socio-economic benefits;
- interest costs are higher compared with state financing.

A suitable PPP model should also be so flexible so that it can handle user fees in order to achieve a broader financing base. Constructions with user fees should be designed carefully to stop any undesired impact on traffic control. In cases where the state is responsible for final financing then payments to the project company should be made as a fixed annual payment. In cases where users are responsible for all or part of the final financing through user fees then user fees are best paid to the state (the Norwegian model).

A calculation example of charges during the contract period: assuming a private party invests 100 MEuro in the transport infrastructure and requires 15 % return on equity investment[40] within an operation period of 15 years: the availability charge paid by the public authorities amounts to MEUR 14 per year.

budgetary consequences of road PPP versus traditional funding and loans

If the project company is entirely responsible for financing investment costs (i.e. uses its own capital and loans on the capital market) then state budgets are not affected until the facility is opened. However, PPP total contract value becomes part of the country's long term liabilities. With regard to the Law on Budget and Financial Management PPP contract expenditure becomes a liability for the current budget year only if service availability payment is planned in the particular year. However, IMF uses a different methodological approach and assumes that PPP contract liabilities in full contract amount become part of annual government liability starting from the contract signature date (ESA 95 standard – European System of National and Regional Accounts).

The economic and state-finance impact of PPP contracts is primarily a periodisation effect. A transfer from financing of infrastructure investments via the main regulations for loan financing in budget law (loans from the National Debt Office) means increased appropriations (credit) scope today at the price of a reduction in appropriations (credit) scope tomorrow. PPP means increased scope below the budget ceiling at the time of investment compared with appropriations (credit) financing.

If the project company is entirely responsible for financing investment costs (i.e. uses loans on the capital market) then state budgets are not impacted until the facility is opened. The budget balance is charged during the contract period with periodic payments to the project company.

[40] the project could be 70 % loan financed (7 % interest) and for 30 % using equity (15 % return required for international contractor incl. risk premium) and 1% maintenance cost in relation to investments.

observations from the current PPP market
On the financial market:

- project finance and PPP lending is competing for scarce regulatory capital allocations with more attractive corporate opportunities. This is testing the viability of the current PPP model;
- the syndicated loan market has stalled;
- bank margins have increased substantially;
- senior bank debt[41] tenors have significantly reduced;
- some banks have partially or totally withdrawn from the Project Finance market. There is also evidence that previously international players have become orientated to their domestic markets;
- no viable capital market solution has emerged to replace the wrapped bond market which closed with the demise of the monoline business.

On the projects:

- projects in excess of 500 MEuro are likely to be too expensive or require substantial public support. Most banks now argue that the very long tenors, i.e. over 25 years, observed in the PPP market before the crisis, were probably unsustainable;
- there appears to be a consensus that shorter term loans, i.e. in the 15-18 years range, are much more 'bankable' and that longer tenors should be the preserve of capital markets. The main driver of the PPP contract duration should however remain technical (life-cycle and obsolescence considerations) rather than financial.

However, the PPP market has not entirely collapsed. Deals are still being brought to market and closing, albeit more slowly. There is a high degree of selectivity on the part of banks and a general lack of consistency in the terms and conditions required by funders.

state incentives for PPP projects
Remedial actions within states' or public authorities' control In addition to expanding already existing forms of public support to PPPs, such as grants or multilateral lending, there are two main new avenues which are being explored by several countries:

- state guarantees, applied to project debt or project;
- bonds (e.g. the French or Portuguese guarantee facilities);
- Co-lending by the state, such as the Infrastructure Finance Unit of the UK Treasury.

EU co-funded PPP projects
PPP's which include a Structural or Cohesion Fund component are possible from a legal and technical point of view. However, projects of this kind are more complex than those with standard procurement, generally take longer to structure and involve more initial cost. For these reasons there are not many successful examples and appear to be none so far in central and eastern Europe. Greece and Portugal have been the most active in using a PPP approach with a Structural Fund element for infrastructure projects (e.g. the new Athens airport, the Antirion bridge in Greece, the Vasco da Gama bridge in Lisbon) where the EU grant element was a contribution to the capital cost. These examples in Greece and Portugal all took place in the 2000-2006 funding period; there has been little new activity in the recent past although Portugal is planning a major high speed rail project as a PPP.

There is no single guidance note or 'cookbook' for PPP projects involving the EU Funds. There are principles derived from EU law which PPP projects of this kind must observe - competition, value for money, equality of treatment, equal access to information, safeguarding of the public interest etc. As mentioned before, currently the Latvian MoF is exploring possibilities to apply PPP procurement together with EU funds.

[41] In finance, senior debt, frequently issued in the form of senior notes or referred to as senior loans, is debt that takes priority over other unsecured or otherwise more 'junior' debt owed by the issuer.

APPENDIX XVIII The current EU financing instruments in relation to the RPMP

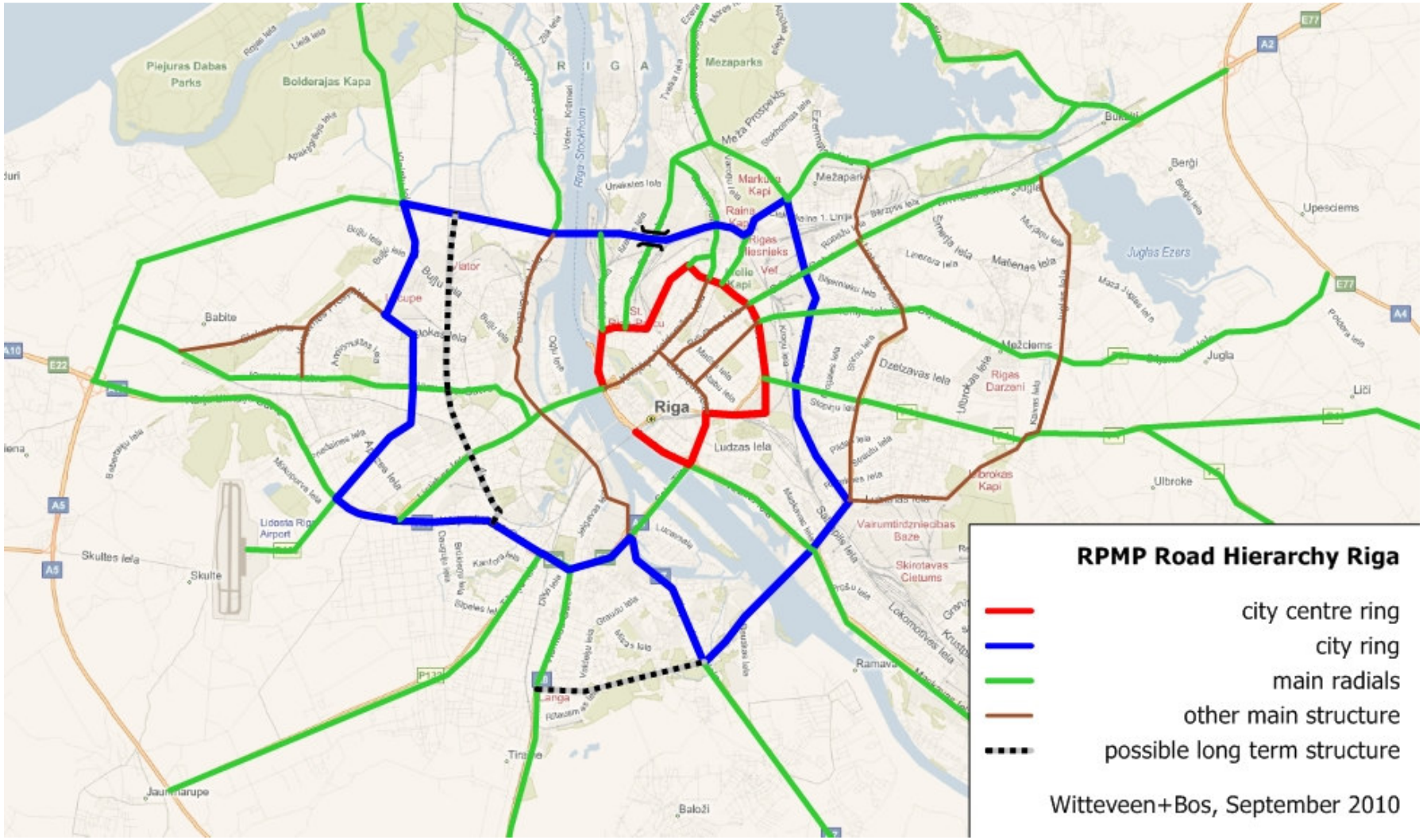
table XVIII.1. Operational Programme 'Infrastructure and Services'

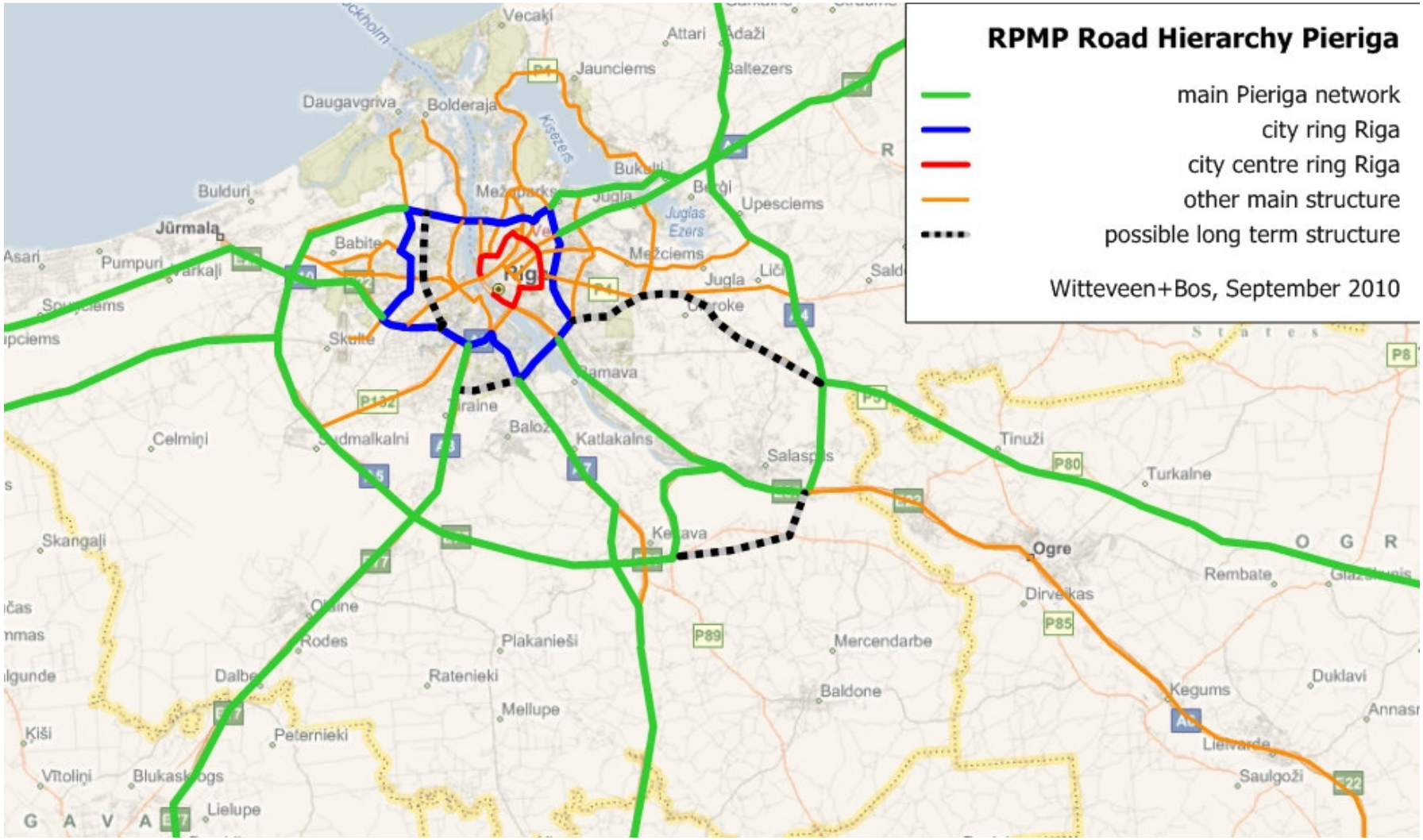
No	Title of Priority, Measure, Activity, Subactivity	Fund	Funding, LVL	Resp. Autho-rity	Co-ope-ration Authority	Project selection procedure	Final beneficiary	Eligible activities	Comments	Source of infor-mation
3.2.	**Priority 3.2 "Promotion of Territorial Accessibility"**		**359.266.842**							
3.2.1.	Measure 3.2.1 "Promotion of Accessibility and Transport System"		226.383.310							
Ration 3.2.1.3.2 to 3.2.1		**16,8%**								
3.2.1.1.	Activity 3.2.1.1. Improvement of the State Category 1 motorway network	ERDF	147.588.840	MoT		CPSP	MoT	Asphalting of roads with gravel surface of state 1st category motorways network, (incl. reconstruction of bridges in the respective road sections)	Indirect relation to RPMP projects. One of the eligibility criteria is important in respect to RPMP since projects of the activity have to have significant role in development of the respective planning region (connection of regional development centers with national development centers or Riga, or Trans-European Network (TEN-T), or ensures accessibility to regional development centers) or the project is continuation of route started during previous road reconstruction programme, and the project is located on a route coordinated with planning region's development council. Funding for Riga planning region LVL 21 174 754.	RoCoM 306
3.2.1.2.	Activity 3.2.1.2. Improvement of transit streets in territories of the cities.	ERDF	42.168.240	MoT		OCFA	Municipalities (except Riga)	Reconstruction and developmenyt of urban transit streets in state main and category 1motorways in locations where the existing infrastructure is deteriorated (for example, collapsed street segments) or cannot provide for the increasing traffic flow	No direct relation to RPMP projects	RoCoM 743
3.2.1.3.	Activity 3.2.1.3. Improvement of road safety in populated areas and Riga.	ERDF	19.056.130	MoT	CFCA					
3.2.1.3.1.	Subactivity 3.2.1.3.1. Traffic Safety Improvement in Populated Areas Outside Riga	ERDF	10.020.945	MoT	CFCA	OCFA	Municipalities (except Riga)	Improvement of traffic safety in populated areas by eliminating the so-called "black spots"-locations dangerous to traffic safety: not only ones with large number of traffic accidents and perished, but also potentially dangerous spots. Implemention of different transport infrastructure improvement and traffic organization measures, in order to reach improvement in traffic safety level with utmost smaller resources. For example, rearrangement of crossings and energy-effective lighting of streets, installation of traffic lights, establishing of pedestrian tracks and passages.	No direct relation to RPMP projects	RoCoM 426
3.2.1.3.2.	Subactivity 3.2.1.3.2. Traffic safety improvement in Riga	ERDF	8.227.185	MoT	CFCA	CPSP	Municipality with more than 500 000 inhabitants (municipality of Riga)	Reconstruction and development works and traffic organization improvement in Riga. Improvement of traffic safety in Riga by eliminating the so-called "black spots" or locations dangerous to traffic safety and by improving traffic management and control system (traffic lights, traffic signs). Construction, reconstruction and renovation of crossings, bridges, tunels and connections in order to increase traffic safety. Construction od different level pedestrian tracks. Construction of energy-effective lighting of streets, instalation of traffic lights. Establishing of pedestrian abd bicycle passages. Construction of public transportation stops.Reconstruction of underground communications and public transportatio nfrastructure if it is strongly related to trafic safety improvement project implementation.	Direct relation to RPMP projects. 1) Road, reconstruction; 2) Railway station; 3) Railway, safety measures; 4) Tram Riga, stations, transferpoints, platforms, shelters; 5) Tram Riga, tramway domain; 6) Minibuses, busstation ; 7) Regional buses, busstation, busstops.	RoCoM 240
3.2.1.4.	Activity 3.2.1.4. Improvement of Infrastructure in Small Ports	ERDF	3.514.020	MoT	CFCA	CPSP	Autho- rities of small ports	Reconstruction of piers and hidrotechnical constructions of common use, instalation of costal strengthening constructions, deepening of fairway and aquatorium of small ports, where international cargo shipments are handled.	No direct relation to RPMP projects	RoCoM 239
3.2.1.5.	Activity 3.2.1.5. Public Transport Outside Riga	ERDF	14.056.080	MoT		CPSP	Municipal capital company, which provides public transport services	Development of public transport outside Riga as alternative to use of private cars (including construction, reconstruction or renewal of existing tram infrastructure, or construction of extension or branch of tram lines or renewal of rolling stock)	No direct relation to RPMP projects	MoT; eligibility criteria

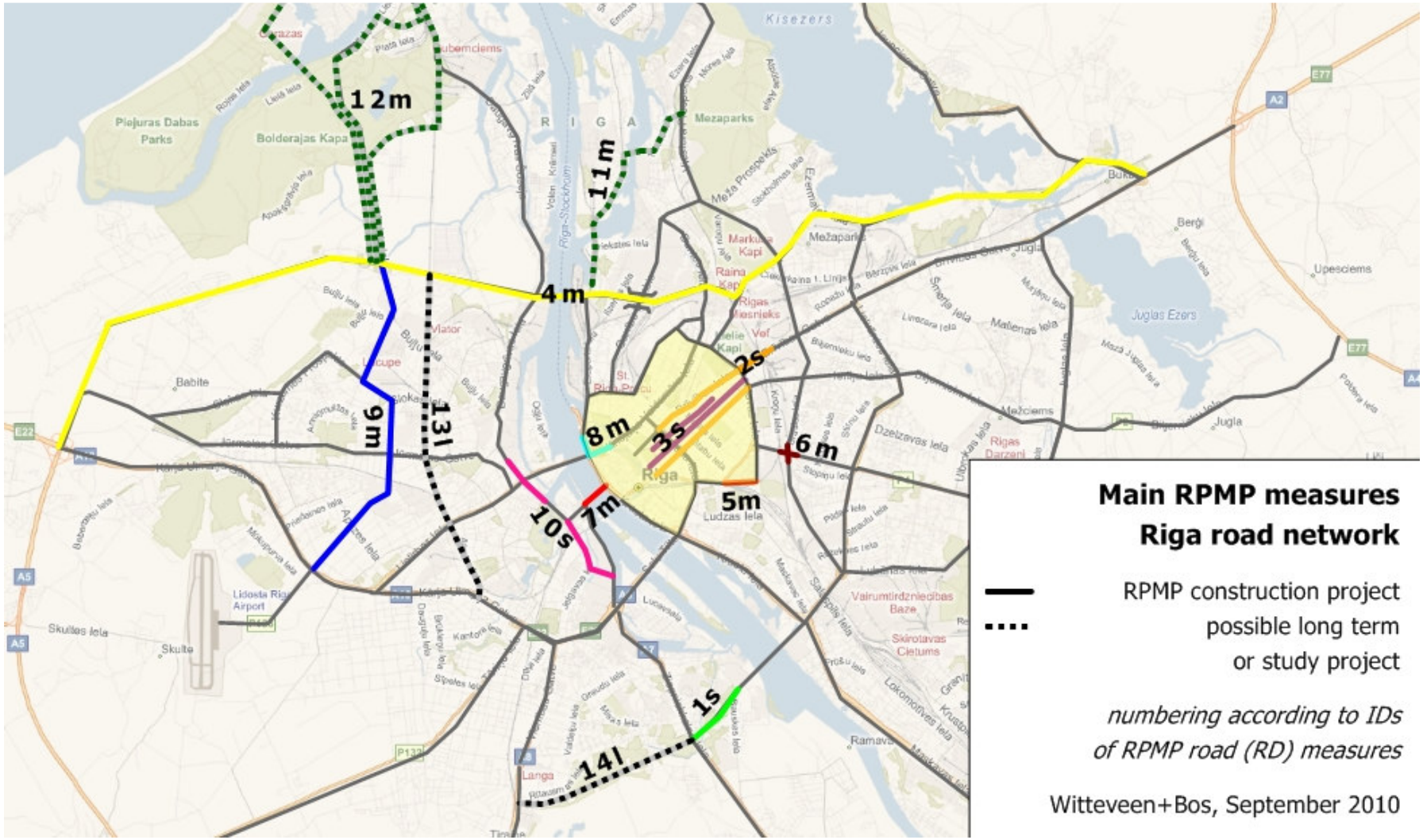
3.3.	**Priority 3.3 "Development of Transport Network of European Significance and Promotion of Sustainable Transport"**		**602.279.450**							
Ratio 3.3.1.5 to 3.3		**37%**								
3.3.1.	Measure 3.3.1 "Improvements		502.200.160							
3.3.1.1.	Activity 3.3.1.1. Improvement of the TEN-T Road Network	CF	209.711.634	MoT		CPSP	MoT	Construction and reconstruction of motorway. Reconstruction of local roads if they are indivisably linked to the implementation of the project.	Indirect relation to RPMP projects. Approved project - construction of Motorway E22 section Riga (Tinuzi) - Koknese. Total eligible costs LVL 160 017 928, CF funding LVL 136 015 239.	RoCoM 212
3.3.1.2.	Activity 3.3.2.1. Reconstruction and Development of the TEN-T Railway Segments (Development of the East-west Rail Corridor Infrastructure and Rail Baltica)	CF	91.713.251	MoT		CPSP	State JSC "Latvijas Dzelzcels"	Construction of new infrastructure or new route development (including reconstruction works needed for development)	Indirect relation to RPMP projects. Implemented project within this activity - construction of tracks Skrīveri – Krustpils (Rīga – Krustpils section) facilitates (improves quality, increeses speed) railway transportation to/from Riga.	RoCoM 852
3.3.1.3.	Activity 3.3.1.3. Development of Infrastructure of Large Ports within the Framework of the "Motorways of the Sea"	CF	117.574.973	MoT		CPSP	Authority of large port; local authority where large port is located or capital company of local authority where large port is located	Construction of new motor transport access roads and railway lines and associated infrastructure. Reconstruction of piers and breakwaters, construction of passenger terminals, construction of berths and cargo transshipment points, development of unreclaimed areas, deepening of aquatorium.	Indirect relation to RPMP projects. Within this activity Freeport of Riga implements project - Development of Infrastructure in the Island of Krievusala for Transfer of Port Activities from the City Centre. Total eligible costs LVL 104 864 866, CF funding LVL 54 248 337.	RoCoM 857
3.3.1.4.	Activity 3.3.1.4. Development of airport infrastructure	CF	44.654.270	MoT		CPSP	State or regional airport	Reconstruction, expanding and construction of passenger terminals of state and regional airports, construction of air craft gates, construction and reconstruction of infrastructure, construction and reconstruction of energy resources, communications and access roads, construction of infrastructure for air craft, passengers and luggage and cargo services, procurement and modernization of airport technical equipment, reconstruction of runway and modernization of aeronavigation systems.	Indirect relation to RPMP projects. Within this activity Riga International Airport implements project - Development of infrastructure of Riga International Airport. Total eligible costs LVL 66 945 228, CF funding LVL 41 114 034.	RoCoM 1476
3.3.1.5.	Activity 3.3.1.5. City Infrastructure Improvements for Linkage with the TEN-T	CF	27.476.868	MoT		CPSP	Municipality with more than 100 000 inhabitants	Development of new routs of main streets, providing effective interrelation and linkage of seperat parts of towns to the Trans-European network elements (construction of two level crossings with railways, construction of access roads to the Trans-European Network, development of new cargo motor transport routes).	Direct relation to RPMP projects: 1) Road, new construction, Northern Transport Corridor; 2) Road, new construction, other. Projects indicated in OP: 1) Reconstruction of Riga Railway Junction; 2) Linkage of Riga Transport System with Via Baltica (Daugava Northern	OP; RoCoM 750
3.3.2.	Measure 3.3.2 "Development of Sustainable Transport System"		100.079.290							
3.3.2.1.	Activity 3.3.2.1. Development of Sustainable Public Transport System	CF	100.079.290	MoT		CPSP	JSC "Pasazieru vilciens"	Modernization of infrastructure of railway passenger services and rolling stock (procurement of new diesel and electric trains).	Indirect relation to RPMP projects. Within this activity JSC "Pasazieru vilciens" implements project - Modernization of Riga commuter area railway passenger services system and renovation of rolling stock of diesel trains. Total eligible costs LVL 144 004 540 , CF funding LVL 43 925 251.	

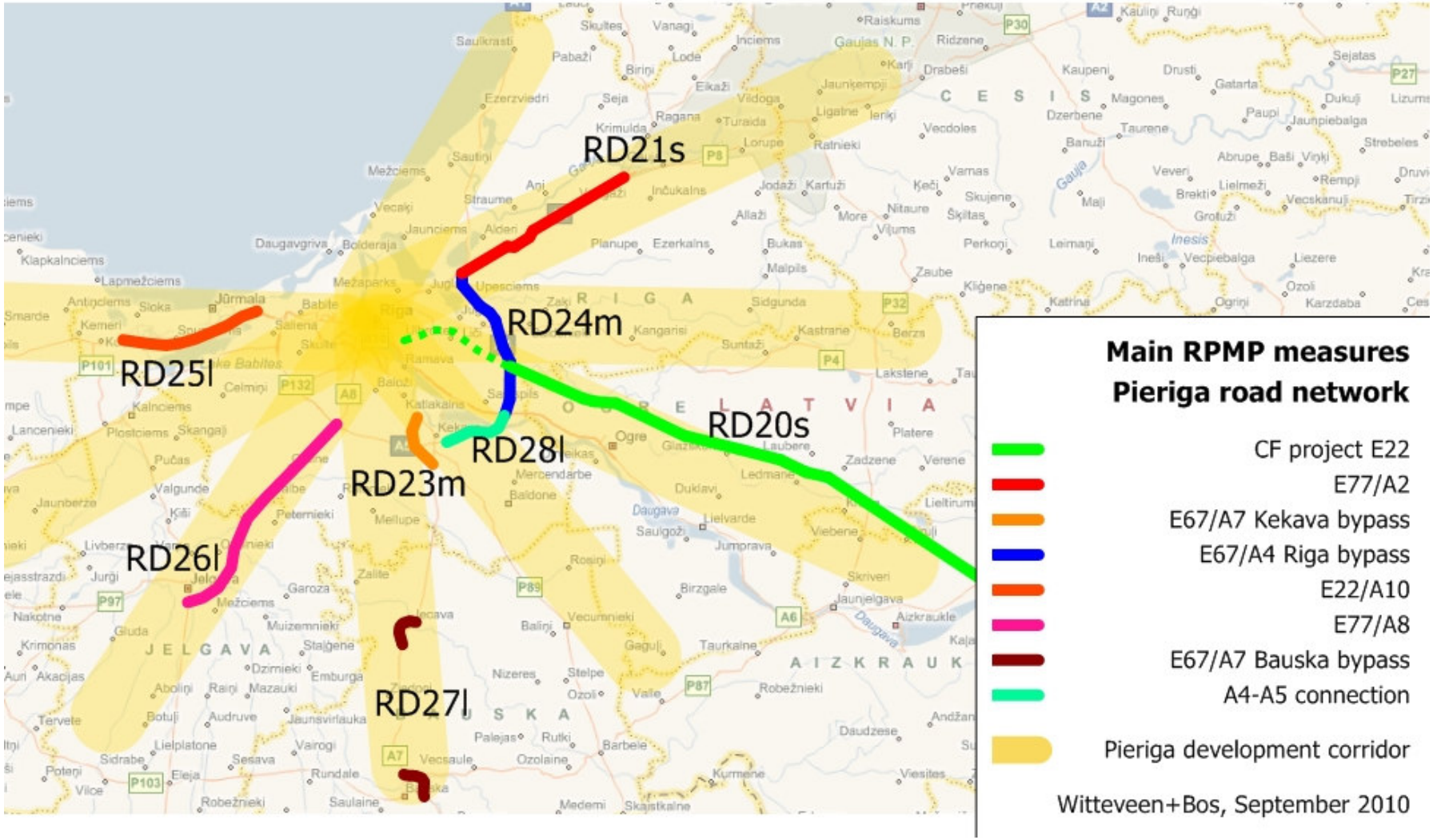
OCFA	open call for applications	MoT	Ministry of Transport
CPSP	closed project selection procedure	CFCA	Central Finance and Contracting Agency
RoCoM	Regulation of Cabinet of Ministers	ERDF	European Reconstruction and Development Fund
OP	3. Operational Programme „Infrastructure and Services'	CF	Cohesion Fund

APPENDIX XIX RPMP Figures


RPMP Road Hierarchy Riga
city centre ring
city ring
main radials
other main structure
possible long term structure
Witteveen+Bos, September 2010
Riga
Mezaparks
Piejuras Dabas Parks
Bolderajas Kapa
Babite
Skulte
Jaunmarupe
Baloži
Ulbroke
Upesciems
Berģi
Mežciems
Jugla
Liči
Ludzas Iela
Dzelzavas Iela
Rigas Darzani
Vairumtirdzniecibas Baze
Skirotavas Cietums
Ramava
Lidosta Riga Airport
Juglas Ezers


RPMP Road Hierarchy Pieriga
main Pieriga network
city ring Riga
city centre ring Riga
other main structure
possible long term structure
Witteveen+Bos, September 2010
Vecaķi
Attari
Ādaži
Jaunciems
Baltezers
Daugavgriva
Bolderaja
Bulduri
Jūrmala
Asari
Pumpuri
Babite
Mežciems
Jugla
Upesciems
Juglas Ezers
Rīga
Skulte
Celmiņi
Katlakalns
Salaspils
Tīnuži
Turkalne
Skangaļi
Ogre
Rembate
Dirveniškas
Rodes
Plakanieši
Mercendarbe
Ratenieki
Baldone
Mellupe
Dalbe
Kegums
Duklavi
Kiši
Peternieki
Vītoliņi
Lielupe
Saulgoži
G A V A
O G R
P4
P8
P80
P85
P89
P132


12m
11m
4m
9m
13l
8m
3s
2s
6m
5m
10s
7m
1s
14l
Main RPMP measures
Riga road network
RPMP construction project
possible long term
or study project
numbering according to IDs
of RPMP road (RD) measures
Witteveen+Bos, September 2010


RD21s
RD24m
RD25l
RD20s
RD28l
RD23m
RD26l
RD27l
Main RPMP measures
Pieriga road network
CF project E22
E77/A2
E67/A7 Kekava bypass
E67/A4 Riga bypass
E22/A10
E77/A8
E67/A7 Bauska bypass
A4-A5 connection
Pieriga development corridor
Witteveen+Bos, September 2010