Traffic flows and potential non-technical solutions in Baltic Loop Southern corridor in Latvia territory

WP2 – Non-technical solutions for cross-border corridors

Corridors: Southern corridor
(sections Ventspils – Riga, Riga bypass, Riga – Valka)

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Introduction

The project BALTIC LOOP seeks to minimize the impact and/or number of different traffic hindrances or bottlenecks on the three selected transport corridors running in the West-East direction; (Northern, Middle and Southern) within the Central Baltic Region, namely Örebro – Turku/Tallinn/Riga – St. Petersburg. The overall aim is to minimize travelling and cargo time in the corridors, and reduce CO2 emissions.

Data collection activities were completed for Baltic Loop Southern corridor in Latvia by collecting data in 3 main sections of the corridor: Riga-Ventspils (A10), Riga bypass (A4, A5, A6), Riga-Valka (A2). During data and information collection process data about amount of all traffic, peak hours, amount of passenger traffic, amount of heavy load transportation, travelling times for trucks between sectors, as well as other optional data were collected. Data collection and corridor description activities were implemented in collaboration with partners from Vidzeme Planning Region. On the basis of obtained data in collaboration of experts from Turku University of Applied Sciences traffic flows and bottlenecks were visualised by elaboration of maps for Baltic Loop Southern corridor and its sections. All information was summarized in this report regarding traffic flows, bottlenecks and challenges with identified potential non-technical and technical solutions in Latvia territory.

1. Baltic Loop of Latvia framework and traffic flows

Within the framework of the Baltic Loop project, data on Ventspils - Riga (hereinafter - A10) and Riga - Valka (hereinafter - A2 / A3) motorways were collected on a Latvian scale (Figure 1). Roads are divided into segments based on statistical information collected by Latvian state roads. The average number of road vehicles per day and hot hours (08:00 - 9:00; 17:00 - 19:00) as well as the average number of truck transports and travel time between sectors were determined. Both indicated transport corridors are in transit, which results in variable traffic volumes. In these transport corridors, data analysis of rail transport was performed, determining the number of passenger transport and its possibilities (train or bus) in both directions. Data on traffic safety, speed limits, type of road, as well as the weak points of the highway that affect traffic, road quality, etc. were also researched.

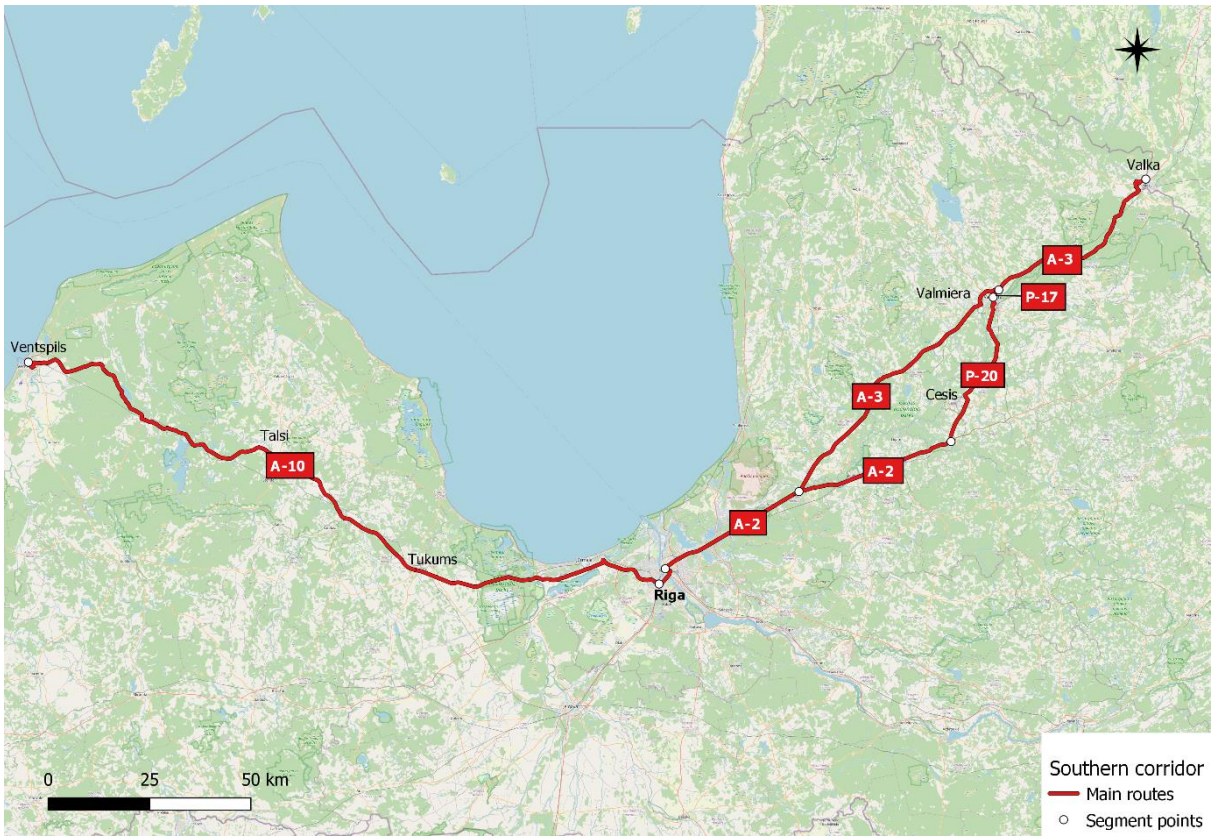

Figure 1. Baltic Loop transport corridor of Latvia

1.1. Average traffic amount per day on all Latvia corridor sections

In general, the most intensive transport sections are when leaving Riga (Figure 2). Traffic is busiest at the beginning of the A10 motorway, leaving Riga with an average traffic volume of 44 928. Traffic remains less intense after 20 A10 km, when the number decreases to 8 289. As you approach Ventspils, the traffic intensity decreases to 3 189.

The same situation is on other Baltic Loop transport corridor A2 motorway, the traffic is most intensive (busiest) leaving Riga with average 40 994 per day. Going further the traffic increase to 25 654. The average traffic number at the end of A2/A3 segment is 2 781.

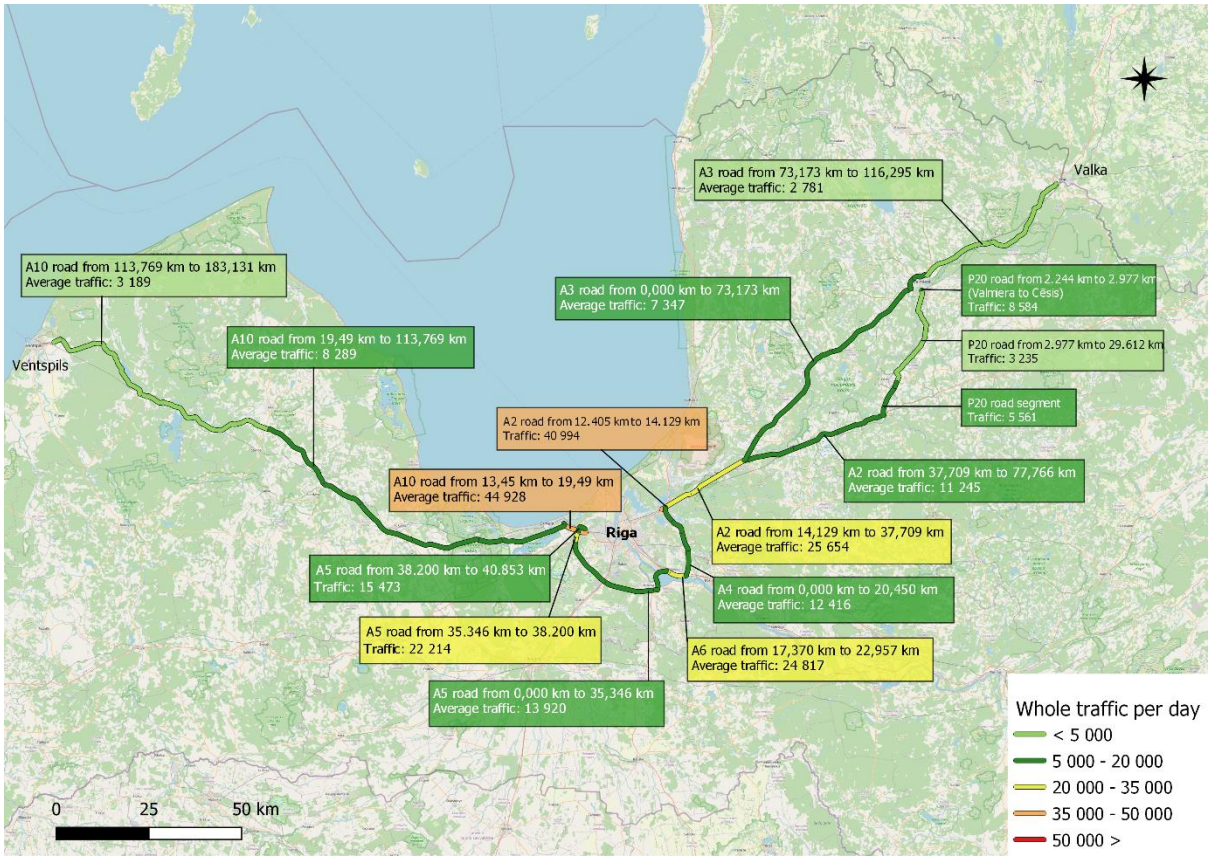

Figure 2. Whole traffic intensity per day

1.2. Average traffic amount per day – Riga bypass

Riga bypass is one of the most intensive traffic connections between A10 and A2/A3 (Figure 3). A pronounced "problem" is observed when leaving Riga, at the intersection with the Riga bypass between the A2 and A4 highway, as well as the A5 highway 5 km. which can be explained by daily commuting, creating a significant influx of private cars entering and leaving Riga.

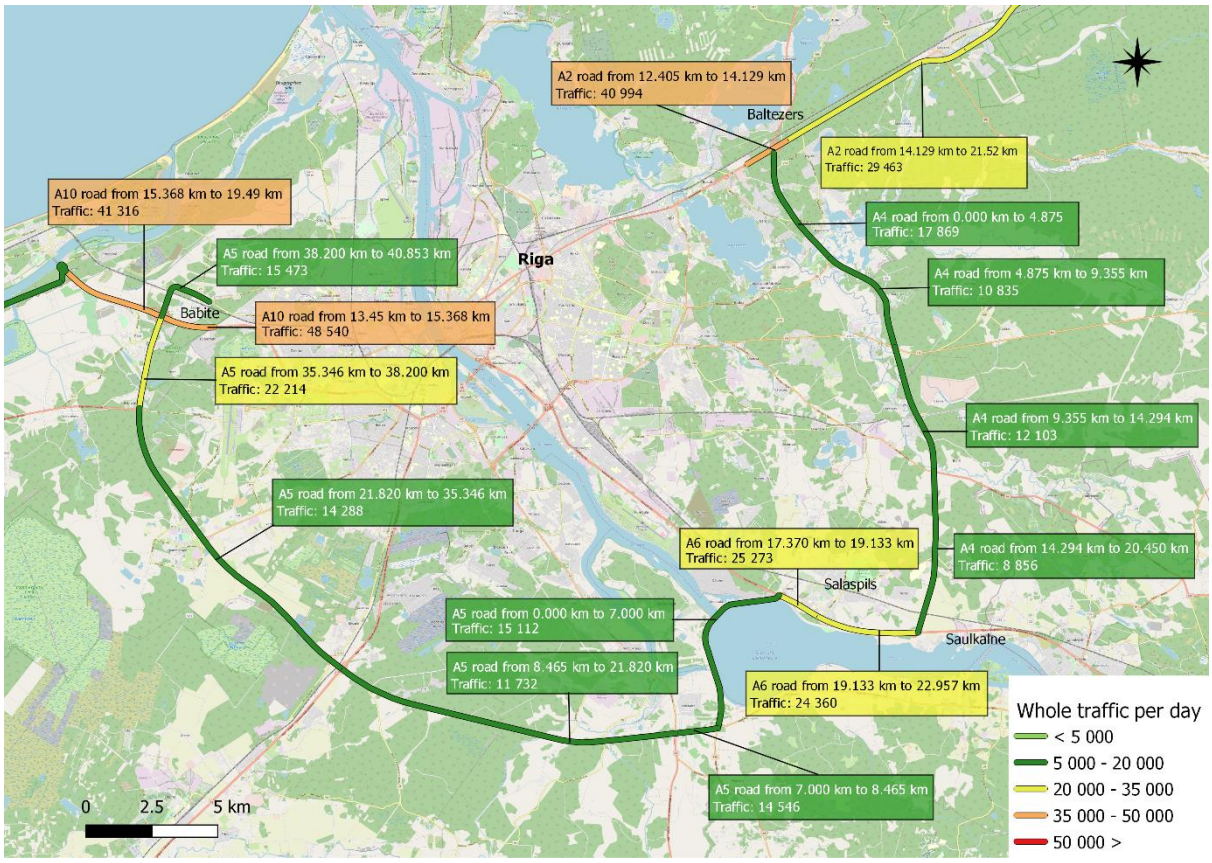

Figure 3. Whole traffic intensity in Riga bypass.

1.3. Heavy transport average amount per day

Heavy transport is one of the reasons why traffic in Riga bypass is so slow and busy. As it can be seen in Figure 4, the cargo traffic around Pieriga is in the highest intensity. The difference between heavy transport intensity in Riga metropolitan area on the side of A10 transport corridor ~ 3 794 trucks in Pieriga to 572 trucks in Ventspils. On the other side of Baltic Loop corridor A2/A3 the intensity of cargo traffic changes from 4 015 at the beginning of transport corridor to 629 trucks at the last segment of A2/A3 road.

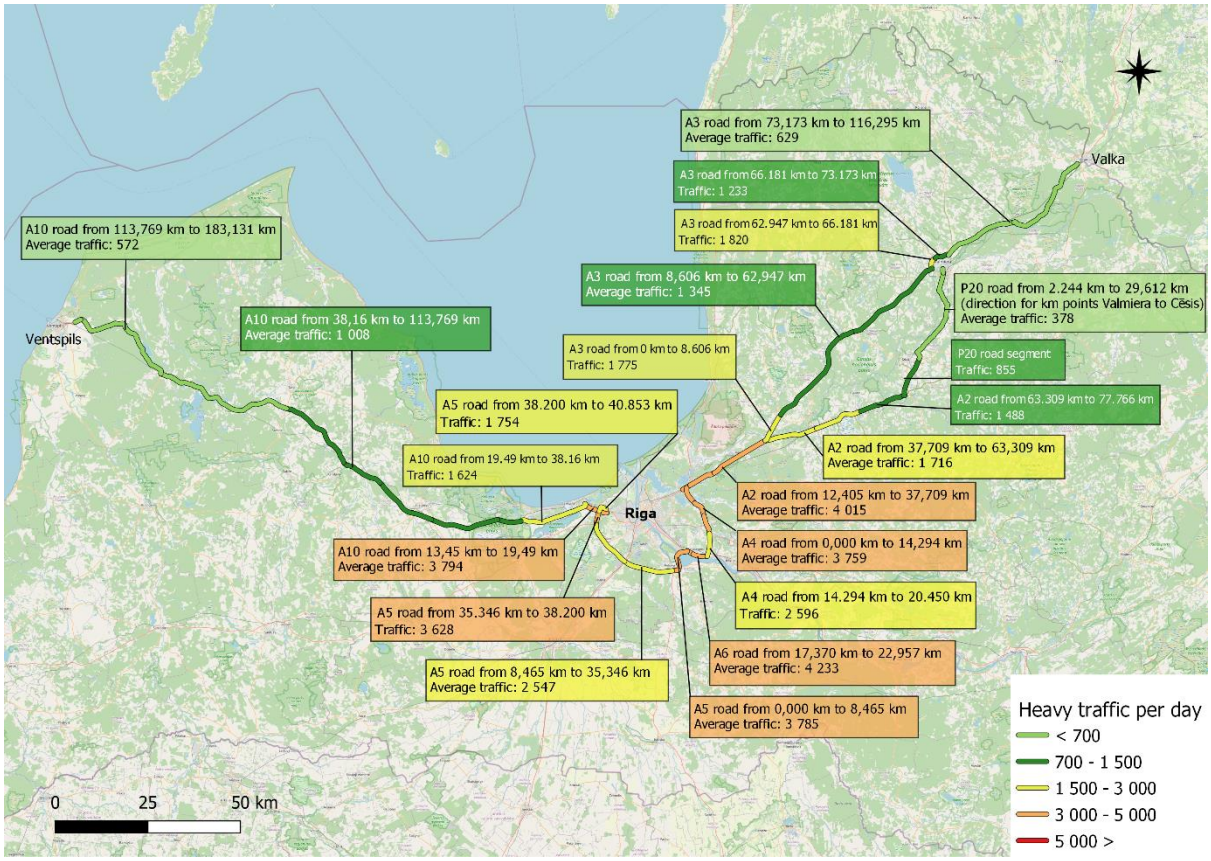

Figure 4. Heavy traffic intensity per day.

1.4. Heavy transport amount on peak hours

As well as congestions of heavy transport are more often observed around Pieriga (Figure 5). Collecting data transport intensity in peak hours (8:00 – 10:00) changes on A10 from rare to none approaching Ventspils. The same situation can be observed on A2/A3 when congestion is moderate closer to Riga and it smooth to none closer to Valka.

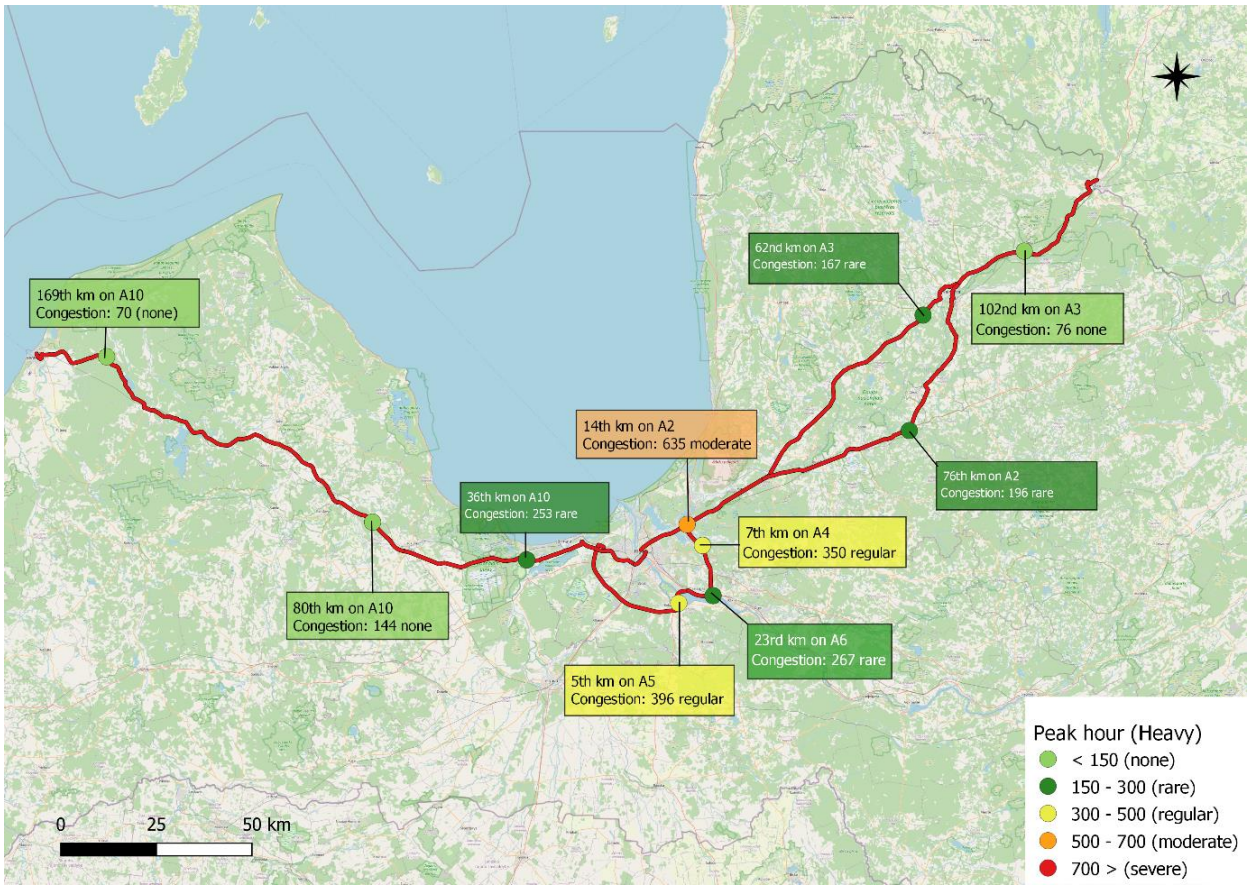

Figure 5. Heavy transport intensity in peak hour.

1.5. Heavy transport amount on peak hours – Riga bypass

There are three congestion points on Riga bypass. Busiest section on Riga bypass is on A4 section Baltezers - Saulkalne direction, from junction with A2 (1+1 lane motorway) 0-5 km. The problem of the traffic jam on this segment is because of the bridge and high intensity of cars and the speed limit. The other congestion is on the 5th km on A5 because of the high intensity cars and traffic light that organizes the traffic.

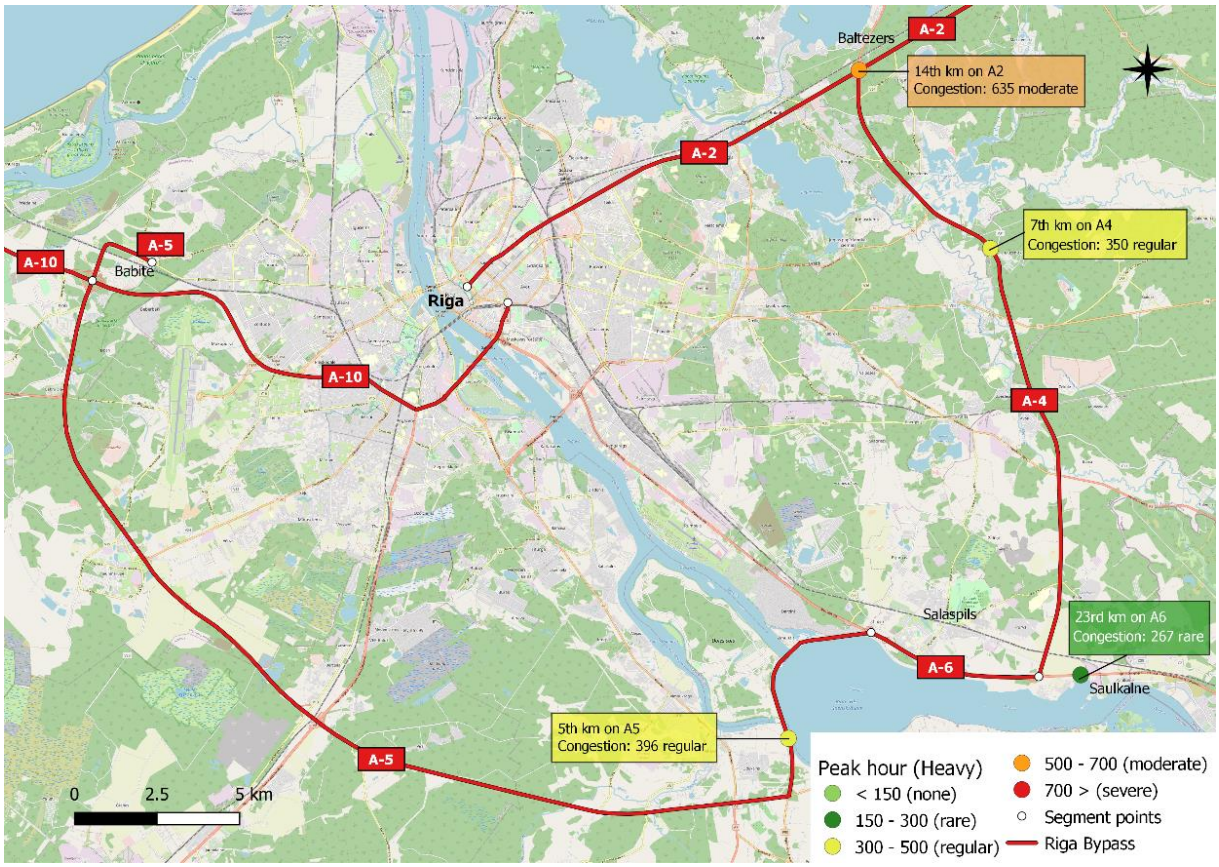

Figure 6. Heavy transport intensity in peak hour - Riga bypass.

1.6. Passenger traffic on Baltic Loop transport corridor

In both transport corridors it is possible to use passenger transport – bus or train (see Figure 2). The railway line is in both directions of the transport corridor. The last stop of passenger train on the A10 transport corridor is Tukums, while on A2 transport corridor, passengers are transported by train till Valka. The railway line, which is on the parallel of the A10 highway, is used mainly for the needs of Ventspils port.

Passenger transportation in the direction of Riga - Ventspils by train is provided 15 times a day to Tukums, using LDZ service, while by bus it is possible to go 34 times a day. To Ventspils there buss is provided 6 times a day. Two passenger trains run every day in the direction of the transport corridor A2 Riga - Valka. To cities closer to Riga, the number of trains is provided more often, for example, Riga - Valmiera - 5x a day and Riga - Sigulda - 13x a day. Bus transportation in the A2 transport corridor is also provided much more often, such as Riga - Valmiera - a bus runs 15 times a day. From Valmiera to Valka it is possible to change 7 times a day in the direction of Valka, from which transport is provided 4 times a day from Riga. Currently, all passenger traffic passes through the capital, there is no public transport connection from Riga bypass city, for instance Salaspils to Riga International Airport.

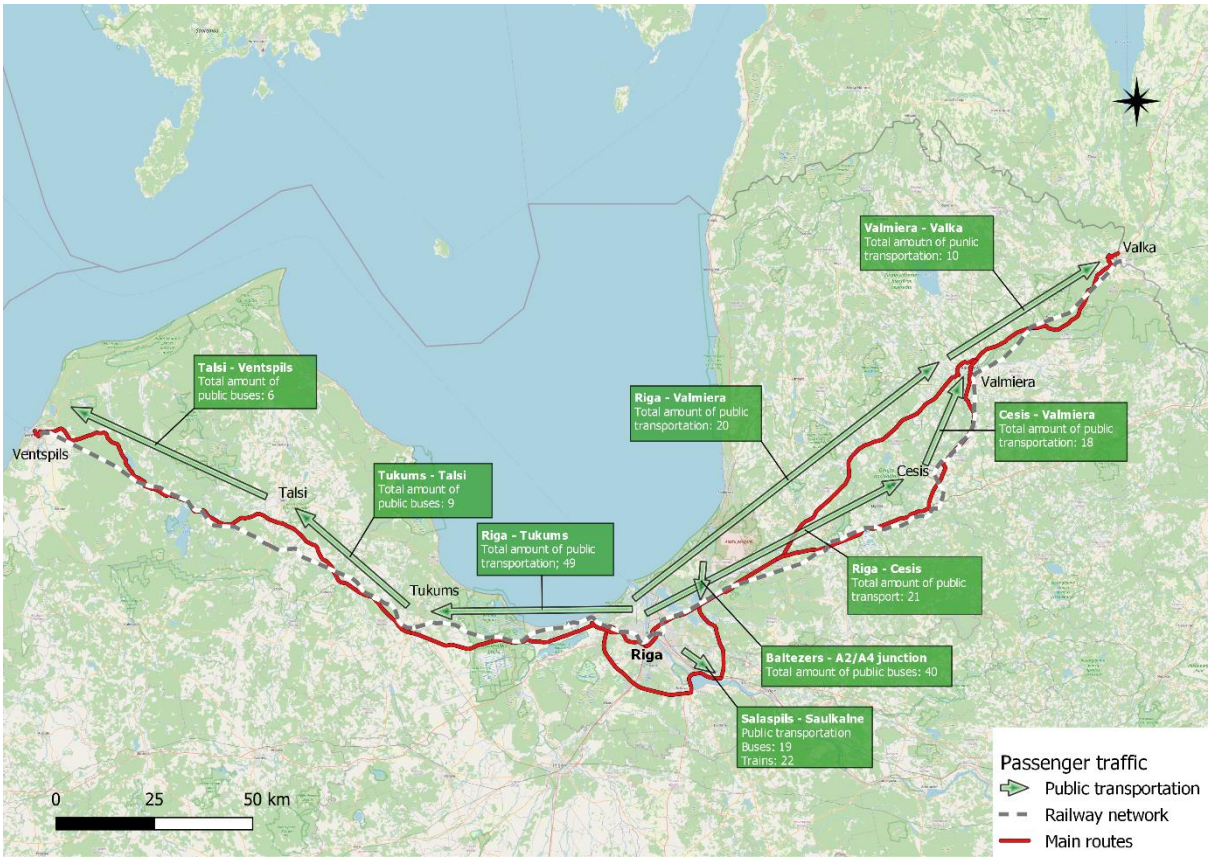

Figure 7. Passenger traffic through Baltic Loop transport corridor.

2. Potential non-technical solutions on Latvia corridor sections of Baltic Loop

This section provides proposals for non-technical solutions that could be implemented to reduce bottlenecks (related to for example speed, capacity, safety, demand, legislation) along Ventspils – Riga, Riga bypass and Riga - Valka transport corridors. In this context non-technical solutions are considered those that require mostly willpower (on organizational level) to act and change current situation rather than technical solutions that in most cases require will and large investments. That is not to say that non-technical solutions are free or cheap to implement. That mostly depends on scale, type, and timeline of selected improvement. Further information will be divided in subsections based on type of transport mode and end users benefiting most form potential improvement. Some improvements have similar effect on multiple user groups so some information may repeat.

2.1. Ventspils – Riga

2.1.1. Public transportation

Currently, public transport connections between Riga and Ventspils are offered only by using public bus service. Buses are one of the main ways how residents can be reached directly from Ventspils to all settlements on the A10 highway till Riga. The passenger train offers its service only up to 71st km on the A10 highways (Riga – Tukums).

After identifying existing situation of corridor Riga - Ventspils public transport links via bus are well provided throughout the day. For people to use public transport service more often, it is necessary to equate it as much as possible with the surrounding conditions to private transport, which would be - fast, convenient and accessible. There are various aspects of how a faster and more efficient connection could be provided by public bus. One of the ways that also works well in other sections of other Latvian road is an additional lane outside populated areas, which allows the driver to maneuver freely and see the road ahead. According to the collected data, the bottlenecks of A10 are defined entering and leaving Riga during peak hours making traffic congestions. It is necessary to provide public transport lanes, as it has already

been created in the city center, so that buses can move more freely, thus facilitating travel time and CO2 emissions.

To improve passenger amount using public services one of the most important thing is TIME. Almost every human being that choose car option is mainly because of the time saving going to the place needed. One of the ways that it could be managed would be by adding express buses on peak hours, they don't need to be as much large as daily buses, it would be entirely sufficient if they were minibuses, thus reducing costs and fuel consumption. In addition, bus stop timetable should be updated by using electrical timetables as it is in central bus station. It would be easier to understand whether the bus is missed or there is a free time to wait.

Otherwise public transportation is well covered in this section. As there is no passenger train provided to Ventspils, it is necessary to consider the possibilities and needs to renew train movement in the direction of Riga – Ventspils.

2.1.2. Private passenger transport and freight transport

Mainly bottlenecks on Riga – Ventspils highway are related to safety and speed aspects where should be done more improvements to decrease accident number on A10 highway.

There are three main factors in road safety: the driver, the car and the environment - infrastructure. One of the main reasons why accidents are caused is because of the driver tiredness. There should be stronger law and restrictions why should the driver not be steering the car in case if he does not feel woke enough. In addition to increase driver's tiredness, there should be more opportunities not only for fright transport stops but also for private transport parking where drivers could take a brake from driving. Potential parking spaces could be in sections of the road where is detected the highest number of accidents. Speed limits should also be improved related to safety on the road. It could be done by adding more electronic sings that are connected to whether on road sections where are mostly weak visibility. The road signs would show permissible speed according to current weather conditions. Road safety improvements also depend on accidents involving forest animals. Animal fences should be set up in places where mostly incidents are happening because of animals as well as speed limits should be on these parts of roads it could limit the accident risk.

2.2. Riga bypass

2.2.1. Public transportation

Main challenges regarding efficient functioning of the Southern Corridor of the Baltic Loop (for road transport) is hindered by the missing Northern Crossing in Riga. Riga bypass is functioning as only connection to get around the city and is experiencing major congestions, especially during peak hours.

The existing rail passenger services at regional and local level are not sufficiently developed and convenient for passengers, as there is a long waiting time between transfers. There is very fragmented provision of public transport on Riga bypass – no existing bus routes operating throughout the bypass and no existing train passenger services operating on Riga bypass, as all railway system around capital city Riga is radially oriented. Regional transport duplicates public transport in city of Riga, creating additional congestion and negative impact on the environment when entering the city centre and current connection between regional and city transport is not efficient.

Transfer between different modes of transport is hindered by the lack of a single ticket, which makes the transfer process more expensive and inconvenient, as tickets need to be purchased for different modes of transport separately.

Potential non-technical solutions:

- Increase of bus & train frequency
- Public transport lanes in cities for prioritization of public transport
- Reducing amout of stops for peak hour routes
- Improvement of ticketing, timetable and route planning services
- Design of larger bus & train stations as multi modal hubs (regional mobility points)

2.2.2. Private passenger transport and freight transport

Similarly to the passenger transport, cargo transport is hindered by the missing Northern Crossing in Riga. Although the flow of cargo transport in the centre of Riga is limited, there is still a high intensity of trucks in the vicinity of the Riga centre, especially in the Port area. This worsens the quality of the environment, causes inconvenience to the population and creates safety risks for road accidents.

Riga bypass is functioning as main connection for cargo flows around capital city Riga. One of the most congested transport corridor is the 'Via Baltica' corridor. Thanks to 'Rail Baltica' development plans and construction of Kekava bypass part of the cargo will be transferred to the railway and the cargo flow along the road A7 through Kekava will decrease. Main solutions for smoother cargo flows are development of junctions – hard congestion on Riga bypass at A5/A7 rotation circle and daily traffic congestions at intersections managed by traffic signals.

Potential non-technical solutions:

- Main bottlenecks are related to safety, speed and navigation – new solutions needed
- Concept of safety improvements – speed cameras, signs, barriers, horizontal markings
- Planning of safe space for cyclists and walkers along corridor next to main roads
- Limitation of left and right turns
- Review of speed limit combinations

2.3. Riga – Valka

2.3.1. Public transportation

In Vidzeme Planning Region along Riga – Valka corridor main public transportation types by number of total passengers carried are regional bus and train connections. Both play significant role to provide mobility opportunities for large proportion of regions population who work, study, or receive other services in capital city of Riga.

Bus services going from largest regional cities in direction of Riga have decent level of service, but many aspects could be improved to make service more competitive compared to private cars. During peak hours bus capacity is fully used limiting potential additional users from entering. Solution – during peak hours **bus frequency should be increased**. During peak hours buses entering or leaving capital city are stuck in traffic jams with regular vehicles – only small portion of distance traveled in city is equipped with public transport lanes that prioritize public transport over private vehicles. Solution – main regional bus route parts in cities should be equipped with

public transport lanes. To improve overall speed of bus travel it is proposed to **reduce amount of stops** on some of peek hour routes. This solution could be counterbalanced by second bus that departs shortly after and has all needed bus stops. In such combination every passenger is served by either providing better speed and shorter total time spent or opportunity to get off at a smaller local bus stop.

To attract new passengers and improve service quality for existing passengers **ticketing, timetable and route planning services should be improved**. Already most regional buses provide option to pay by card or to use some application for ticket purchase (provided by third party), but still tickets are assigned for each of single trips. That is not an issue if your trip consists of one public transport mode and you use it once but if you have to combine multiple bus rides or combine bus and train to get to your destination this becomes more of an issue. **Timetables should be optimized and updated** to create system were smaller bus nodes can feed-in passengers from more distant locations. Also, competition of train and bus by having similar departure times should be reduced in favor of train as backbone of public transport. **Routes should be updated** to suit current needs of passengers because many areas along bus routes are dynamically developing and often points of interest change (new ones open, some close; for example, schools, shops, workplaces).

Overall public transportation should be viewed and developed as part of Mobility as a service system where each mode supplements other and does not compete directly with others. For that reason, to strengthen this approach even further it would be necessary to **design larger bus and train stations as multi modal hubs** with bike rent / share systems, scooter, car share systems. That would help to solve first and last mile issues.

Solutions that are oriented toward passenger train transport overlap with solutions for buses. Increased frequency, express trains with fewer stops, better timetable organization are main things to strive for. Other improvements are investment heavy, for example new, faster, more comfortable trains.

Both modes of public transport would benefit from **public mobility campaigns** that are oriented toward behavioral change and are actively promoting public transport

as reasonable and sustainable choice. Also, both modes should aim to **improve reliability and punctuality** to improve passenger trust and once again motivate to choose public transport over private vehicles.

2.3.2. Private passenger transport and freight transport

In Vidzeme Planning Region along Riga – Valka corridor main road network consists of connections between larger regional cities, capital city Riga and Estonian cities. Main bottlenecks are related **to safety, speed, and navigation**.

Safety related improvements consist of more **signs, reflective signs, speed rumble strips** along roads and in those parts where two opposite traffic flows are not divided by other elements (barriers, safety islands), **speed cameras** that would use computer vision to detect speed limit offenders and aggressive drivers. In addition, **parking opportunities for heavy fright vehicles** should be improved – before big investments current situation should be analyzed and potential currently existing large size parking lots close to corridor should be marked with propriate parking signs and directions. Where road width allows road **horizontal markings** (with rubber stoppers or safety poles where possible) should be installed to give some protection and **safe space for cyclists and walkers** along corridor. Where possible additional **lightning** should be installed with priority to places where people to tend to crossroad without proper road crossing infrastructure. **Animal fences** and animal two level **animal crossings** should be installed in places where incidents involving wild animals happen. In many places along corridor **left and right turns should be limited** where they create collision risks and do not have additional slowdown lanes.

Speed related improvements often are secondary result of improved safety. Less accidents on roads, especially where there is no option to bypass the accident result in faster overall travel time and reduce unnecessary traffic jams. In addition, along Riga-Valka corridor 50/70/90/100 kmph **speed limit combinations should be reviewed** to make travel more fluent without need for rapid acceleration and braking.

Navigation related improvements consist of **better sign syste**m that is friendly and easy to understand to international travelers and locals who are not familiar with specific area. As Vidzeme Planning Region is significant tourism destination special

attention should be put toward navigation that is needed for tourists. With **ITS signs** that can display dynamic, important real time information it would be possible to inform drivers about accidents and traffic jams down the road or inform them about road conditions (ice, snow). Such signs could also give drivers information about best route to choose during peak hours entering largest cities – if there are multiple options and they are changed in five minute intervals it would in theory give some opportunity to remotely control traffic flow by splitting main flow in multiple directions.