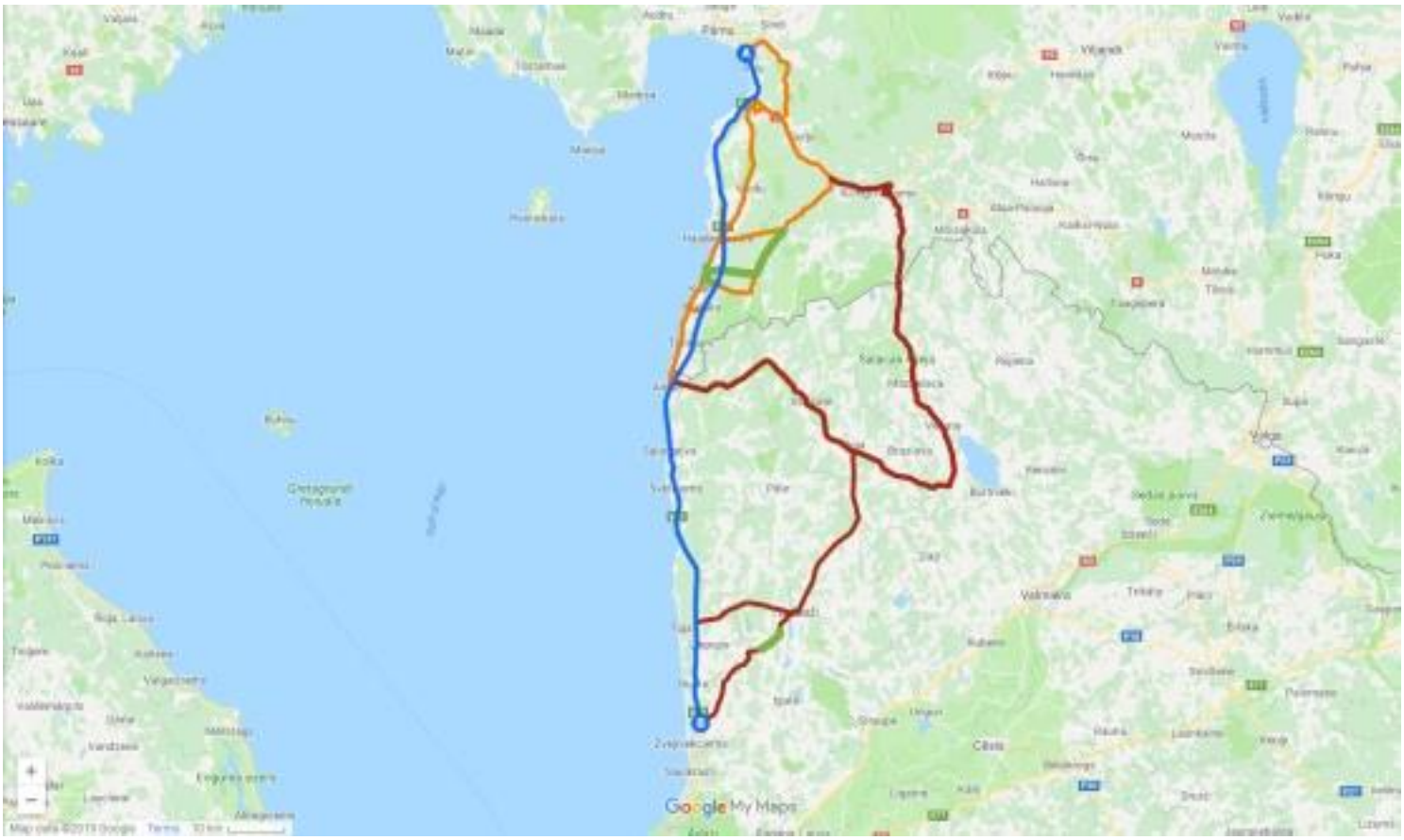
MAANTEEAMET

Teede Tehnokeskus

E67 Via Baltica Estonian-Latvian cross-border

Traffic Management Plan



Interreg Central Baltic

SMART E 67

European Union
European Regional Development Fund

E67 Via Baltica Estonian-Latvian cross-border

Traffic Management Plan

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INTRODUCTION

In the scope of the SMART E67 project there was the intention to develop a traffic management plan (TMP) for the cross-border section of the Via Baltica road between Estonia and Latvia. There are two main operators that manage the traffic on state roads in normal road conditions: the Estonian Road Administration in Estonia and Latvian State Roads in Latvia. Strengthening cooperation and coordination of work, especially in border areas, is a serious interest of both parties.

This work is based on the EasyWay deployment guideline "Traffic Management Services. TRAFFIC MANAGEMENT PLAN FOR CORRIDORS AND NETWORKS." The vision of the European Core Service "Traffic Management Plan for Corridors and Networks" is the effective delivery of traffic control, route guidance and information measures to the road user in a consistent manner, thus increasing the performance of transport infrastructure by adding the potential of cross-border, network or multi-stakeholder co-operation, when needed.[1] Traffic management services have been provided by national road authorities in Estonia since 1997 and in Latvia since 2004, but harmonized cooperation on the border has only recently been planned. This is the first endeavour to agree on certain activities and coordinate these activities through a common TMP.

Harmonization of variable-message sign (VMS) management principles is another target of the initiative. One hundred and sixteen ITS units have recently been introduced along the Via Baltica road, including new road weather stations and weather-controlled VMSs. The initial working principles for sign management were developed in both countries separately under the SMART E67 project and one year of practical operations has already taken place, so the next logical step was to use the experience gained so far and harmonize the working principles of the VMSs to give road users transparent information about the conditions and potential risks.

The work was completed in cooperation with:

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[1] EasyWay deployment guideline "Traffic Management Services. TRAFFIC MANAGEMENT PLAN FOR CORRIDORS AND NETWORKS."

1. SCOPE OF IMPLEMENTATION THE TRAFFIC MANAGEMENT PLAN

As the aim of the project was to develop a cross-border traffic management plan, only a certain part of E67 has been selected for implementation the plan. The whole E67 transport corridor covers 202 km in Latvia and 192 km in Estonia, more specifically the border traffic section situated between Pärnu and Skulte.

More precisely, the section starts in Estonia from Raeküla District in Pärnu at E67 (main road no. 4 Tallinn-Pärnu-Ikla according to the Estonian road classification) and the secondary road T59 (Pärnu-Tori) intersection and continues along the E67 road to Skulte, where the main road (A1 according to the Latvian local road classification) crosses the secondary road P53 Duči-Limbaži (Figure 1). The main reasons for selecting this part of E67 are:

- Homogenous and more nature for traffic to transit
- Outside of cities
- Higher proportion of heavy traffic (more than 30%)
- Similar length in both countries (around 60 km)
- Covers junctions with at least a secondary road network with the best possible options for rerouting

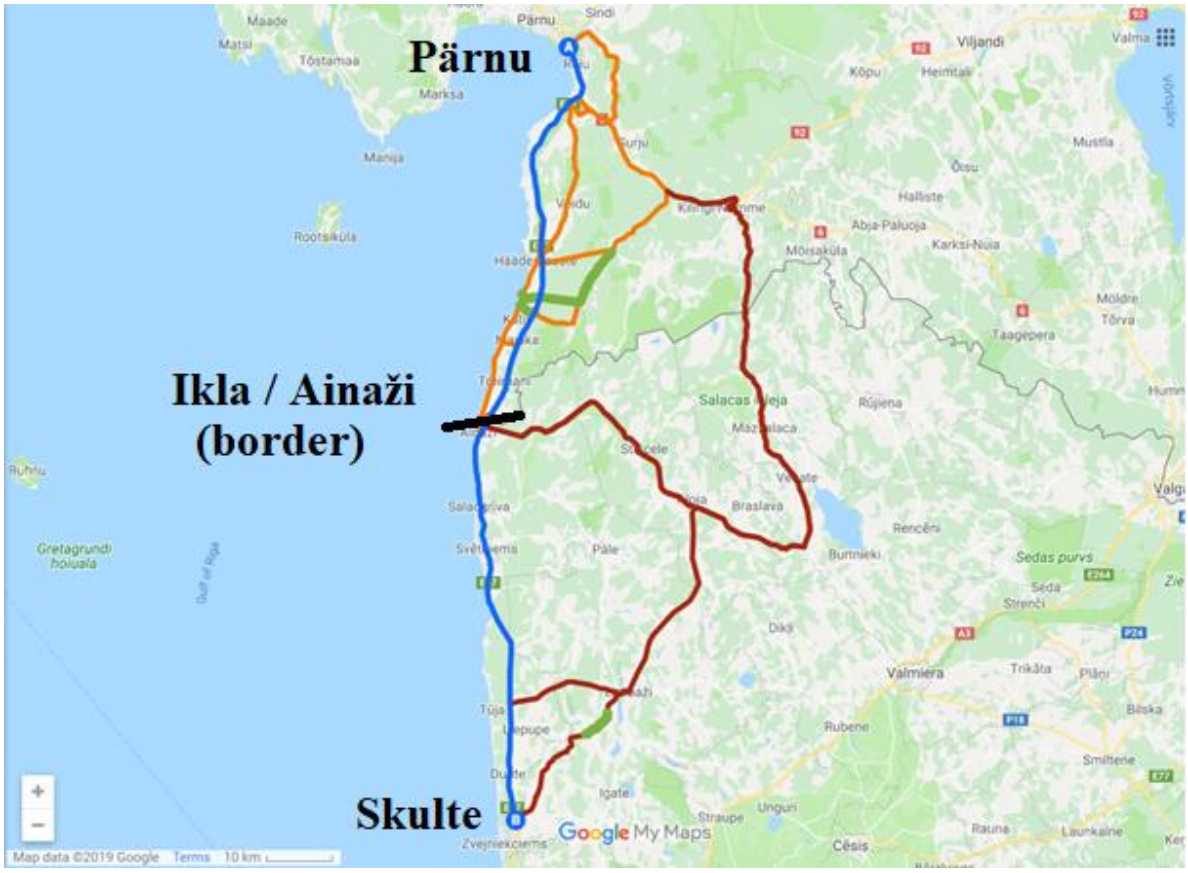


Figure 1 E67 Estonian-Latvian cross-border TMP section with bypasses

The total length of the selected E67 section is 120.1 km of which 58.8 km is situated in Estonia and 61.3 km in Latvia. It's a two-lane road with traffic in both directions and without barriers between the directions. The maximum allowed speed limit is 90 km/h.

In case of serious interruptions on the longer section between Riga and Tallinn, other alternatives could be used, for instance, through Valka and Valga by E264 from Riga to Tartu and by E263 from Tartu to Tallinn or through Murati and Luhamaa by E77 to Luhamaa and by E263 from Luhamaa to Tallinn. If the shortest distance by E67 from Riga to Tallinn is 307 km, then through Valga the distance is 119 km longer and through Luhamaa 196 km longer.

2. TRAFFIC CHARACTERISTICS AND RISK FACTORS FOR TRAFFIC OBSTRUCTIONS

AADT is between 10,828 and 4,591 in Estonia and between 6,670 and 4,573 vehicles in Latvia. The share of heavy traffic is between 20 to 44% and the higher numbers characterize the sections closer to the border. More details about traffic in the cross-border section are in Annex 1.

According to statistics from the last ten years, there is one traffic accident concentration area in Estonia, the Tõitoja X-shaped intersection on road no. 4 at km 168.3, which has been recently rebuilt. In Latvia there are three so-called black spots. Two of them are also X-shaped intersections – at km 40.3 (Skulte/ Duči) and km 55 (Jelgavkrasti) – and one is a T-shaped intersection at km 45.3 (Priedulāji).

Although traffic accidents are mainly concentrated at the intersections, there is still quite a high risk of traffic accidents with serious consequences and long-term disruption of traffic between the intersections because of a high proportion of heavy traffic and a road with non-separated directions. Head-on collisions may easily happen if, for example, hazardous weather conditions appear or if a car breaks down.

Road pavement quality is relatively good on both sides, and both summer and winter maintenance is performed according to the highest standards. Nevertheless, the section has long stretches near the Baltic Sea, so especially in winter, rapid changes in road conditions may occur due to weather and the marine climate.

According to the risk analysis, critical events that may cause a traffic disruption on this cross-border road section are:

- Serious traffic accidents, road structural failures or weather events which cause a total road closure
- Traffic accidents, road structural failures or obstacles on the road which cause a partial road closure
- Difficult weather causes poor road conditions, and the risk of traffic accidents is increased
- Severe or extreme weather conditions are forecasted or have arrived (can have wider impact)
- Roadworks (speed reduction, one-lane closure, total road closure, local or longer bypasses)
- Major public event, for example, the Positivus Festival
- Demonstrations, strikes

The main cause for traffic disruptions on this cross-border road section is with great probability traffic accidents with heavy good vehicles (HGVs) due to weather phenomenon. It is important to monitor traffic performance and deviations with traffic monitoring equipment, cameras and services provided by third parties (Waze, Google Maps, Here, etc.), follow weather and road conditions from the road weather information system and keep track of national weather service forecasts and hazardous weather alerts, for example, via the website www.meteoalarm.eu.

When an incident happens or is likely to happen, it is necessary to monitor the event's development and take action if needed. It is important to start informing road users immediately through different channels such as variable-message signs, web portals and social media channels or using media partners to share press releases if quick and extensive communication is required. When a potential incident has a big impact in cross-border area, cross-border cooperation, according to the TMP, should be started, which includes coordinated information exchange and in the worst cases, coordinated traffic redirection. This project includes TMP implementation principles and a couple of examples of TMP for how to plan and organize actions in different traffic disruption and weather situations. See more in Section 5.

To monitor traffic performance and weather conditions, permanent equipment is needed, especially when it comes to weather monitoring. A significant effort was made when in the scope of the Smart E67 project, new road weather stations were installed along the E67 road. The cross-border section is now well equipped on the Latvian side. There are five road weather stations equipped with cameras, and the average distance between them is 14.4 km.

The situation is not as good in Estonia as there are only two weather stations in the same long section and only one is equipped with a camera. See more details in Annex 2. The distance between those two weather stations is 38.2 km, which is too great to adequately monitor the conditions in the whole stretch. One important thing is to monitor conditions and inform the road users; another, and even more important, factor is that road maintenance companies are also well-informed and prepared for hazard conditions and weather changes so that potential accidents can be avoided and risks minimized. It is highly recommended that at least one weather station be installed around Häädemeeste in the near future.

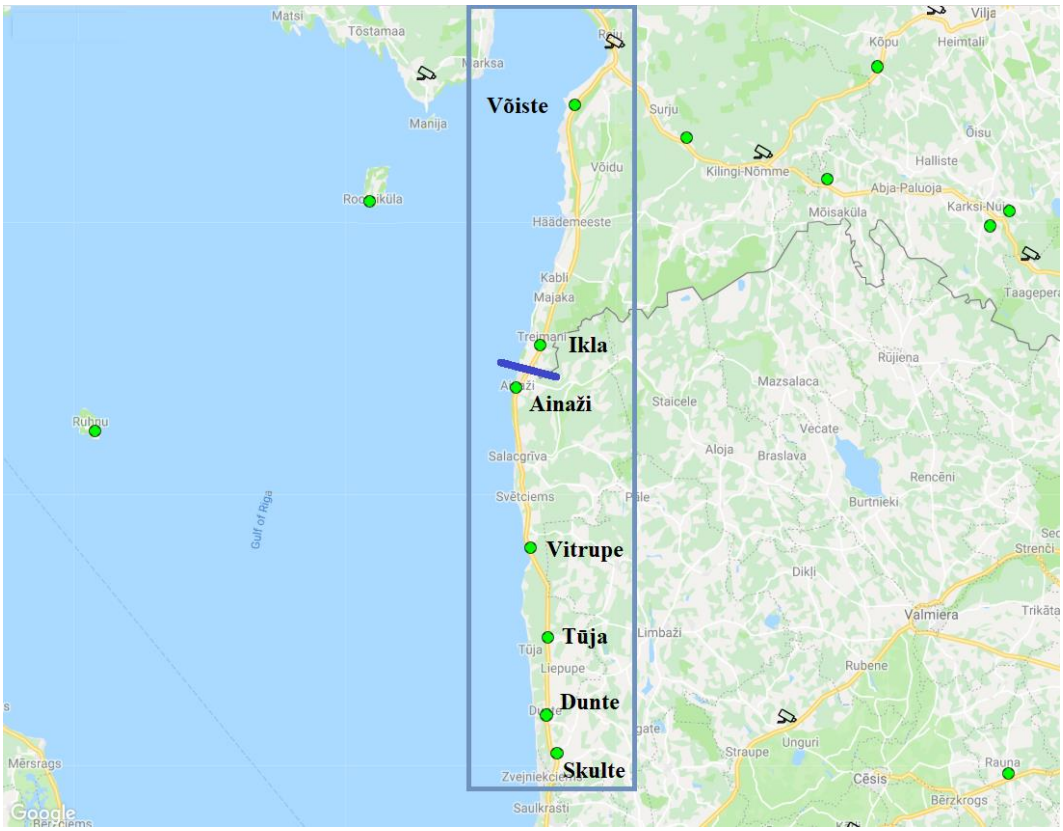


Figure 2 E67 Cross-border TMP area and the road weather stations network

3. EXISTING TRAFFIC MANAGEMENT PROCEDURES AND OPPORTUNITIES FOR IMPROVEMENT

3.1. TMC and procedures in Estonia

The Estonian Road Administration (ERA) is a government agency operating within the administrative area of the Ministry of Economic Affairs and Communications. On the basis of and to the extent prescribed by law, the ERA performs the implementation of state policy and development programmes, management functions and state supervision, and applies the enforcement powers of the state in the field of road management, traffic safety, public transport and the environmental safety of vehicles.

Since November 1, 2017, the Traffic Management Centre (TMC) was established as a successor of the former Traffic Information Centre. The TMC was established in order to improve safety and reduce time spent in traffic by ensuring that road users receive operative and preventive information. With regard to this change, the Road Administration began outsourcing the service of the road information line 1510 from the Help and Information Centre of the Emergency Response Centre (HICERC).

The Traffic Management Centre handles the following tasks:

- collection of information regarding traffic restrictions and its publication in the portal TarkTee, as well as forwarding information regarding important limits to the media;
- collection of information on winter road conditions from maintenance providers and forwarding it to the media;

- mediation of information regarding opening and closure of ice roads;
- issue of permits for special carriages and maximum weight;
- management and monitoring of variable-message road signs, traffic cameras, crossing gates and other traffic management equipment.

There are also three procedure documents at the Estonian Road Administration. One outlines processes for setting up for heavy winter weather conditions, including event information gathering and dissemination. The second one describes possible disruption situations and relevant communication activities where HICERC dispatchers have the main role. The third explains HICERC road-related service processes. The TMC is still in the formation phase and their working principles and processes are not yet described in detail.

3.1.1. Guide: Setting and Terminating Heavy (Winter) Weather Conditions[2]

According to the guide, the TMC has a definite role to play in heavy winter weather condition announcement.
The TMC's role comes up when those conditions set up have already been decided.

The general procedure is the following:

- reception of hazardous weather forecast information from the Estonian Weather Service
- reception of the information about setting up the heavy winter weather conditions
- information dissemination to police and crisis situation addresses, including rescue services and ERA management
- preparation of press release and dissemination to the mass media

And once the situation has returned to normal:

- reception of information about termination of heavy winter weather conditions
- information dissemination to crisis situations addresses, including rescue services and ERA management and mass media

3.1.2. Guide: Events related activities

This guide is specifically targeted to support the Help and Information Centre of the Emergency Response Centre, which operates the road information line 1510 in the case of incoming calls with different concerns. According to the guide, the TMC has a relatively small role to play in certain situations.

The list of events described in this guide:

- snow/ice on the road – no action by the TMC
- traffic obstruction – TMC to be informed if traffic is stopped for longer than 12 hours. Public information is broadcast by ICERC if needed.
- tree(s) on the road – no action by the TMC
- flooding – no action by the TMC

[2] Heavy (winter) weather conditions is a special term for hazard winter weather conditions when road operators cannot provide road conditions according to the requirements for the state of the roads

- unmarked object (vehicle) – no action by the TMC
- paved or gravel road condition, road access is limited – no action by the TMC
- loose gravel on the road – no action by the TMC
- rubbish on or beside of the road – no action by the TMC
- road debris – no action by the TMC
- defect on the bridge – no action by the TMC
- railway crossing – no action by the TMC
- road construction – no action by the TMC
- traffic arrangement – no action by the TMC, except when opening/closing the barrier at the median is need, and/or the VMS information sign not working. In both cases the TMC is to be informed about who is taking appropriate steps.

3.1.3. Process description: providing 1510 services

The 1510 services process description is a set of procedures which handle information flow coming mainly from road users to the Help and Information Centre of the Emergency Response Centre. The first step is to record the event in the MIKIS electronic diary. The next step is to prioritize the event. There are three levels of priority classification for the events – high, medium and low. For a high-priority event, for example, a traffic accident, collapse of the road structure, unexpected black ice, etc. information is to be delivered to certain predefined e-mail addresses. For a high-priority event which can cause danger to the road user's health, a press release written by HICERC is sent to the media. This centre is also responsible for providing all kinds of information to the public upon request through the free information line 1510 and/or e-mail. The preferred channel of information dissemination is, however, the traffic information portal TarkTee, where all necessary trip planning information is gathered. The TMC's role is to be ready to receive requests to open or close the barrier at the median.

3.2. TIC and procedures in Latvia

Since October 26, 2004, Latvian State Roads has been a state joint stock company that operates according to company statutes and the agreement "On Road Sector Management" signed with its main client, the Ministry of Transport of the Republic of Latvia. The main tasks of Latvian State Roads (LSR) are implementing the counting, registration, management and protection of state roads; preparing the strategy for state road network preservation and development; administration of state road financing; organizing public procurement in the road sector; organization and control of the road network design; construction, repairs and maintenance; preparation of legal acts of the branch and monitoring their implementation; co-ordination of traffic safety organisation on roads; and supervising the construction, maintenance and protection of parish, company and household roads.

The Traffic Information Centre (TIC) was established in 2005 to support road users by informing society about driving conditions, traffic restrictions or disturbances in the state road network and to coordinate the work of road authorities.

The Traffic Information Centre performs the following tasks in twenty-four-hour mode:

- monitors traffic condition by using road-monitoring systems;
- operates a free-of-charge hotline at +371 80005555;

- summarizes traffic information and provides this information on the LSR home page;
- manages its social media services on Facebook and Twitter;
- coordinates co-operation of emergency services for operative elimination of traffic disturbances;
- processes statistical data for LSR needs.

Latvian State Roads uses two comprehensive document packages for both daily operations and communication in crisis situations. The Traffic Information Centre dispatching service instructions gather all essential requirements and guidelines for independent work in the TIC in one place. The document provides detailed working principles and the work organization of TIC, cooperation principles with the LSR contact centre and general action procedures for traffic crises and problem situations. Another document compiles crisis communication arrangements, including definitions and description of crisis situations, guidance for crisis communication arrangements and LSR external communication procedures provided by TIC and the LSR contact centre.

3.2.1. TIC dispatching service instruction

The TIC dispatching service instructions state that the TIC manages and coordinates the LVC external communications in the daytime and the TIC serves as the LSR official communication channel outside working hours. The TIC has a direct impact on the management of traffic incidents and related crises situations and the responsibility to circulate related information and communication with clients and partner organizations. TIC operators are responsible for making sure that traffic information managed by the TIC is properly disseminated and published in electronic environments (web pages, social networks, e-mail, etc.). If overload is predicted, a second dispatcher will be called in to work a shift to ensure effective information flow.

Particular attention is paid to maintaining attention and awareness over the road situation by systematic tracking of different information services, like the LSR web page, winter weather pages, the maintenance vehicle tracking system, social media apps, etc. There is also the obligation to immediately inform responsible persons of malfunctions in any of the applications.

The contact centre infoline, which integrates e-mail, a text messaging service, an infoline with a voice mailbox function, a tasks calendar and a social media account operation service is an important communication tool of the dispatcher. The dispatcher should be registered there upon arrival. The document provides clear instructions on how to use the infoline services.

Last but not least, general principles of how to act in crisis situations are provided. For that, another legal act on crisis communication arrangements has been adopted. If any information about traffic disruptions arrive, the dispatcher should act proactively in identifying and addressing the situation. When processing incoming information, the dispatcher also identifies potentially inadequate actions by LSR staff or partner organizations prepares a short problem report if such a situation has been identified.

3.2.2. Crisis communication arrangements

The crisis communication arrangements document first defines potential crisis situations then describes crisis communication arrangement by schema and in the form of text. There is a detailed list of possible crisis situations, and LVC management reporting procedures for each potential situation are defined. Finally, external communication procedures for crisis situations are described.

The following crisis situations are possible in Latvia according to the document:

1. Natural or technogenic disasters (including traffic accidents, emergency events at road works sites, etc.) or the activities of persons (including criminal offences).

2. A heavy road traffic accident on public roads (fatal or injury), or traffic accidents that cause significant damage where the responsible authorities also mention the road situation among the main reasons.

3. Sudden breakdown or deterioration of national roads or their premises which would cause traffic to be substantially limited or stopped altogether.

4. Extraordinary events according the MK instructions No. 16:

4.1. Event associated with a significant number of victims;

4.2. Catastrophe or criminal offence causing material injury;

4.3. The event entails a risk to the environment, human health or safety and order at the local, regional or national level;

4.4. The exceptional event that has a significant impact on the functioning of the sector and involves two or more ministries in the liquidation of its effects;

4.5. A disaster or accident occurring in the country requiring an international institution to be notified;

4.6. An international institution or a foreign country has provided information on a crisis (conflict) situation or threat to national security or the interests of Latvia.

Guidance information for crisis communication arrangements states that the TIC's responsibilities in crisis situations are to act as a central communication unit between the LSR departments, national operational services, road operators, other organisations and road users, ensuring the coordination of information flow on a 24-hour basis. The TIC dispatcher should refine the data of the crisis situation and provide the responsible LSR units with necessary information as well as share necessary info with road users.

The LSR external communication guide indicates how validated information on the crisis situation is to be prepared. The short statement must include:

- the characteristics of the situation (event, place, time);
- the effects on the traffic;
- a description of the measures to be taken or planned;
- instructions or recommendations for the road users if necessary;

In the case of a crisis, a TIC dispatcher also sends SMSs to drivers. They also cooperate further with communication department to prepare special statements and press releases to be published on the company web site and in social media.

3.3. Improvement proposals for existing procedures

In both countries traffic management and communication procedures for response to potentially disruptive events are well described. The Latvian TIC has relatively more responsibilities, whereas in Estonia a considerable share of the work is shared between the TMC and HICERC. The Latvian TIC general working procedures as well as crisis communication management are described in a more

detailed manner and their advantage is particularly apparent when a new employee joins the team and fast induction is expected.

As the intention is to improve cooperation in traffic management, information exchange and dissemination in the border area, all actions in this area can be based on the same principles and information. However, there is some room for adjustment of procedures in three areas:

- which information is available and should be used to determine the event situation;
- what activation and deactivation criteria should be used for taking action;
- what channels can be used for information dissemination.

As further described, there are two main types of data which characterize road performance: traffic and weather. Traffic can be measured at traffic monitoring points, but more precise data section by section can be gathered from third-party services such as Waze under the CCP incentive. Tests in Estonia have shown that if road section average speed data from those services is continuously followed, it is possible to get quick feedback about traffic conditions and possible places of disruption. At the moment there are no clearly described procedures for how the potential event situation can be discovered. In Latvia there is an obligation to periodically follow traffic flow data on the LSR website, but Waze speed data has not been integrated into the systems yet. In Estonia the tests with Waze section speed data have only just begun and in the procedures the Waze data is not mentioned yet as a potential source of information.

The weather data is important to collect, especially in winter. However, in summer heavy winds and precipitation can affect trafficability. The parameters which are used in the categorization of situations used to be measurable and usable. For example, wind gust speed is usually used when determining dangerous weather conditions, but at the moment no wind gust speed data is available from Latvian road weather stations. In addition, no criteria for how the Latvian Weather Service determine dangerous weather conditions have been defined. The data to be used should be agreed upon and freely available for both traffic management operators.

In Estonia some boundary values are defined when, for example, announcing heavy winter weather conditions. At the same time, those values are described slightly differently in various documents and do not correspond exactly to the limit values for determining severe or dangerous weather conditions by national weather services. There is no exact weather criteria defined, and the national weather service is not mentioned as one potential source of information in the Latvian procedures. It is recommended that the determining parameters be harmonized and the suggestions made in this work used as an indicator.

The main information channels are also slightly different by country. Latvia uses more opportunities offered by social media to inform road users daily, and the number of followers has grown considerably over the years. There are nearly 10 thousand followers on Twitter and nearly five thousand on Facebook. In Estonia Maanteeamet, ousand followers, actively uses Facebook in social campaigns but does not systematically share road condition information there. It does not yet use Twitter for traffic information dissemination. Waze is a very popular service in both countries, but it has some limitations with regards to official information dissemination.

When considering the need for a quick and effective way to reach to the target audience, social media has considerable potential for growth. However, it must be taken into account that increasing the number of followers is time-consuming and it may take years to grow audiences to a considerable level. In cross-border cooperation the language issue should also be considered and the consistency of messaging paid attention to. The usage of social media could be one topic in both countries' procedures, and it should be agreed upon how to use it more on uniform bases.

How cross-border information exchange should be organized should also be agreed upon because the Latvian TIC operates in 24/7 mode and the Estonian TMC operates only on weekdays during the daytime. Outside of working hours, both the HICERC and TMC receive information. If events happen outside of working hours and there is information to transfer to Latvia, then the initial information processor at the HICERC should provide the necessary information to the TMC on-duty employee who translates and transfers the information to the Latvian TIC. If the event happens outside of TMC working hours in Latvia, then the HICERC is the initial information receiver that makes a preliminary data analysis and if a high-priority event happens, sends a press release to media; in other cases, the HICERC transfers the data to TMC by e-mail. The TMC and HICERC should specify how exactly information transfer with the Latvian TIC is to be organized outside of TMC working hours.

4. ANALYSIS OF EVENTS, TMP BENEFIT ASSESSMENT

There have not been any significant traffic accidents in the E67 Via Baltica cross-border section recently. Within the last five years there has been one fatal traffic accident in the cross-border section. The accident happened on November 21, 2017, at 05:21 on Tallinn-Pärnu-Ikla Road at km 179.57, 12.7 km from the border to the north. It was a collision of two trucks from Poland. One of the drivers lost control of his vehicle just before the accident and the loose load killed the driver of the vehicle driving in the opposite direction.

21.11.2017 E67 Tallinn-Pärnu-Ikla road, km 180, partial road closure, traffic accident

One of the reasons for the accident was black ice on the road due to earlier precipitation followed by a clear sky and a temperature drop below 0 degrees. The road had not been recently treated because the closest road weather station (Ikla, 10 km to the south) was showing damp pavement with a small amount of remaining salt on the road. The road was partially closed due to the accident and there were no significant traffic disturbances.

One conclusions from this accident was that road wasn't treated with salt according to the existing road conditions. The road was icy, but the maintenance operator wasn't aware of it. Ikla road weather station was showing moisture and salt on the road, but the next road weather station on this road was out of order. Single weak rainstorms arrived from the sea (2.5 km to west) this night and it washed away all the salt.

Such road accident can be avoided if all road weather stations are maintained and put in working order before the winter season and the station network better covers the road (the distance between the stations should not be more than 20 km). When preventative salting is regularly used in such borderline situations and VMS warning signs are switched on when the road temperature is close to 0 and could drop below 0 degree, the road pavement is potentially wet or damp and residual salt is almost non-existent.

Realization of the TMP in this particular situation probably couldn't have prevented the accident, but communication between the traffic information/management centres could provide some certainty for managing these situations and coordinated messages to the road users could prevent event escalation and further accidents from happening. It is known that this accident was not the only one in this particular region that morning, and a quick reaction after the first signal could have relieved later impact.

Recently on E67 some truck accidents have occurred, but all were outside of the cross-border area, between Tallinn and Pärnu, where traffic density is considerably higher. Usually, the road is partially closed and no major delays reported, but this year two truck accidents closed the road for some time

between Tallinn and Pärnu. The first accident happened on April 28, 2019. It was Sunday morning and traffic density was considerably low. Quick rerouting was organized by the police.


28.04.2019 E67 Tallinn-Pärnu-Ikla Road, km 118, total road closure, traffic accident

The second accident happened on Monday, May 13, 2019, and for clean-up purposes the traffic was diverted around the accident. Recently installed VMSs were used to guide road users.


13.05.2019 E67 Tallinn-Pärnu-Ikla Road, km 119, total road closure, traffic accident, rerouting

30.05.2019 E67 Tallinn-Pärnu-Ikla Road, km 110, partial road closure, traffic accident

14.06.2019 E67 Tallinn-Pärnu-Ikla Road, km 114, partial road closure, vehicle failure

Many years ago a demonstration against weight restrictions was organized on the road. This event was well organized and no traffic closures or major delays occurred.

02.03.2011 E67 Tallinn-Pärnu-Ikla Road, km 122, demonstration against lowering weight restrictions

In conclusion, although few events occurred on the E67 cross-border section in Estonia within recent years, it is still good to have a well-prepared TMP for potential events with potential action plans and communication and rerouting procedures.

5. INSTRUCTIONS FOR IMPLEMENTATION OF TRAFFIC MANAGEMENT PLAN

A TMP is the pre-defined allocation of a set of measures for a specific situation in order to control and guide traffic flow as well as to inform road users in real time and provide a consistent and timely service to the road user. Initial situations can be unforeseeable (incidents, accidents) or predictable (recurrent or non-recurrent events). The scenarios and actions are always selected on a temporary basis. The main procedure is to react to the event according to the TMP instructions.

For this particular cross-border area, the following incidents are estimated to be likely and the relevant scenario and action are to be selected.

No	Potential incidents	Scenarious	Actions
1	Serious traffic accident, road structural failure or weather event which causes **total road closure**	ST3 - ST5	ST3A1 - ST5A7
2	Traffic accident, road structural failure or obstacle on the road which causes **partial road closure**	ST2 - ST3	ST2A1 - ST3A6
3	**Difficult weather** causes poor road conditions, the risk of traffic accident is increased	SW1 - SW3	SW1A1 - SW3A6
4	**Severe or extreme weather** conditions are forecasted or have arrived (can have wider impact)	SW1 - SW4	SW1A1 - SW4A7
5	**Roadworks** (speed reduction, one lane closure, total road closure, local or longer bypasses)	ST1 - ST5	ST1A1 - ST5A7
6	Major **public event** (passive obstruction)	ST1 - ST4	ST1A1 - ST4A6
7	**Strike** (active obstruction)	ST2 - ST5	ST2A1 - ST5A7

Table 1 Potential incidents on E67 Via Baltica cross-border section

5.1. Scenario selection criteria

The main scenario selection criteria are traffic and weather impact. For that, two tables have been created. The main criteria for traffic-dependent scenarios is delay from normal traffic. The longer the delay is, the more actions are needed. The table includes actions on white and grey backgrounds; the first means activities within the country and the second cross-border-coordinated activities.

The following actions may be required:

Monitoring – monitoring of the situation through available information channels and sources; no need for special action

Information sent to VMSs – if the event has a local impact, it is enough to use the closest VMSs for public information, if available.

Information sent to social media and TI portals – if the event has a broader impact, it is necessary to provide the information to a wider audience than only drivers close to the event. In this case, the traffic information portals https://tarktee.ee and https://lvceli.lv/ and social media channels such as Facebook and Twitter are to be used.

Press release – in more serious situations, special press releases are to be prepared with public relations departments to make the news more official and to allow it to be broadcast more widely.

Information sent to neighbouring country – in cases of a certain traffic delay and/or road/weather condition in the border section, information exchange between the TMC and TIC is to be started. Emails and phone calls are usually used, but for a short chat other messaging services can be considered.

Recommendation to avoid section (park or reroute) – if traffic is remarkably disrupted and considerable delays are there or expected or road conditions are very poor or severe weather conditions are forecasted, it is appropriate to recommend stopping HGV traffic in order to prevent serious accidents and additional obstacles. There is a limited amount of parking spaces available (see Annex 7) in the section, and therefore the broad shoulder section between Riga and Tūja or the 1 km 4-lane road exiting from Pärnu towards Riga could be another option for temporary parking.

Stop traffic and rerouting – if the event causes traffic delays for more than two hours or extreme weather conditions are expected, traffic regulatory measures should be made ready, including HGV forced suspension or detouring. In this case, the leading role will be played by the police in close cooperation with road maintenance operators. The TMC and HICERC in Estonia and the TIC in Latvia must play supporting roles for those institutions to ensure that the information about the traffic reorganizations is delivered promptly and without error to the parties and road users.

1. Traffic disturbance

Actions	Treshold for activation (delay from normal traffic) *				
	+ < 10 min	+ 10 - 30 min	+ 30 - 60 min	+ 60 - 120 min	+ > 120 min
Scenario	ST1	ST2	ST3	ST4	ST5
1. Monitoring (internal)	X	X	X	X	X
2. Information to the VMS (local)	_	X	X	X	X
3. Information to the social media & TI portals (broad)	_	_	X	X	X
4. Press release (formal)	_	_	_	X	X
5. Information to the neighbouring country (cross-border)	_	_	X	X	X
6. Recommendation to avoid section (park or reroute) (active)	_	_	X	X	_
7. Stop traffic & rerouting (agressive)	_	_	_	_	X

* Start action immediately if such delay is highly probable

Table 2 Traffic-dependent scenarios and actions

If a traffic delay is or expected to be less than 10 minutes outside of the norm, then simple monitoring of the situation is needed. When a traffic delay is more than 10 minutes but less than 30 minutes, VMS information is recommended to be added.

At the moment, there are two VMSs in Estonia where a more detailed description of the event can be displayed. One sign is located at the southern border of Pärnu in the south at km 134.2 and another is located near the border in the north at km 191.8.

VMS on E67 Tallinn-Pärnu-Ikla at km 134.2, south

VMS on E67 Tallinn-Pärnu-Ikla at km 191.8, north

In Latvia the typical VMS consists of two full-matrix VMS displays, where the upper sign can be used to show a warning sign and the lower sign can be used to show the length of the event or distance to the event.

VMS on E67 Rīga-Ainaži at km 10.4, north

Some examples of how full-matrix displays can be used to warn road users of potential danger ahead:

Source: Hb-V321 Variable trafikkskilt, Norway; 2100065-v-09-vaihtuvien_opasteiden_kaytto, Finland

13.05.2019 E67 Tallinn-Pärnu-Ikla road at km 119, total road closure, traffic accident, rerouting

If the traffic delay is or expected to be longer than 30 minutes in the cross-border area, in addition to informing the public, cross-border information exchange is required. Relevant activities should be started immediately when the situation is likely and before escalation of the event.

The main criteria for weather-dependent scenarios are weather and/or road conditions that have been forecasted or have already occurred. The weather scenarios are mainly based on National Weather Service announcements, which are available on the website www.meteoalarm.eu. The main criteria for acting out the scenarios can be found in Annex 3. The corresponding criteria for the existing situation can be found in Annex 4 and 5.

2. Certain road and weather conditions are forecasted or have arrived

Actions	Treshold for acting out scenario			
	Satisfactory driving conditions*	Poor weather conditions** / Poor driving conditions*	Severe weather conditions** / Very poor driving conditions*	Extreme weather conditions**
Scenario	SW1	SW2	SW3	SW4
1. Monitoring (internal)	X	X	X	X
2. Information to the VMS (local)	X	X	X	X
3. Information to the social media & TI portals (broad)	-	X	- / X	X
4. Press release (formal)	-	-	X	X
5. Information to the neighbouring country (cross-border)	-	-	X	X
6. Recommendation to stop traffic or rerouting (active)	-	-	X	X
7. Stop traffic (agressive)	-	-	-	X

* E67 VMS management rules in Estonia

** National Weather Services announcement

Table 3 Weather- and road condition-dependent scenarios and actions

5.2. Completing the TMP

The TMP is introduced for every event separately and final completion is done according to the particular situation. The TMP form consist of two parts: permanent and variable. The permanent part (Table 4) will not change from event to event and gives general information about the location, type of the TMP, parties involved and status of the plan.

The variable part (Table 5) should be completed every time according to the event situation and location, corresponding traffic and weather condition and for particular situations' selected scenarios and actions. Road sections and bypass options can be selected from the table in Annex 6, and parking options are given in Annex 7. The fulfilled TMP is used for guidance and documentation of local TMC/TIC activities as well as for informing the other TMC/TIC about planned activities.

TMP form completion is recommended in all cases when there is a traffic-disruptive event or a potential risk for event escalation. In more severe cases, when cross-border activities are required, TMP form completion and sharing with the other centre is mandatory.

Two examples have been developed to facilitate the completion of the TMP form (Table 6 and 7, full version in Annex 8 and 9). Although the TMP examples may be very general, they will start cross-border cooperation for a particular event. It is expected that there will be continuous information exchange

during the event and all changes in situations which cause changes in scenarios and actions should be announced.

GENERAL INFORMATION OF THE TRAFFIC MANAGEMENT PLAN	
Region:	CENTRAL BALTIC
Name:	Cross-border TMP Pärnu-Skulte road section
Status:	Under development
Date of implementation:	-
Initial situations:	Weather conditions, road works, major public events
Traffic management measures are applied:	Information exchange, full or partial closure, traveller information, re-routing, HGV storage
SPATIAL ASPECTS	
Expansion:	Cross-border
Network involved:	Highway E67 Pärnu (Estonia) - Skulte (Latvia) section TMP; 120.3 km 
ORGANISATIONAL ASPECTS	
Partners involved:	Estonian Road Administration, Latvian State Roads
Regulatory framework:	Agreement to be signed

Table 4 TMP permanent part

OPERATIONAL APPROACH			
Event/incident name:			
Time:			
Type/description:			
Location:			
Traffic impact:			
Expected duration:			
Weather conditions:			
Scenario name:	Scenario 1	Scenario 2	Scenario 3
Spatial application:			
Treshold for activation:			
Treshold for deactivation:			
Organisations involved:			
Measures and actions:			
Waiting areas:			
TECHNICAL ASPECTS			
Communication between partners:	e-mail, phone		
Roadside systems and systems to inform the road users:	Variable message signs, internet, social media, press releases		

Table 5 TMP variable part

OPERATIONAL APPROACH			
Event/incident name:	**Partial road closure (accident)**		
Time:	05.01.2019 12:05:00		
Type/description:	Two vehicle accident, one participant vehicle (HGV) disrupt traffic		
Location:	A1 km 92.3, Section L3, Valdemara iela - Salacgriva, AADT 4573, Freight transport 1966 (43%)  		
Traffic impact:	temporary passage of traffic through one lane, congestion is likely to occur		
Expected duration:	1 - 3 hours		
Weather conditions:	Poor weather conditions SW2		
Scenario name:	ST2	ST3	ST4
Spatial application:	A1 km 57.6 - A1 km 100.0	A1 km 57.6 - A1 km 100.0	A1 km 57.6 - A1 km 100.0
Treshold for activation:	delay 10 - 30 min	delay 30 - 60 min	delay 60 - 120 min
Treshold for deactivation:	delay < 10 min	delay < 30 min	delay < 60 min
Organisations involved:	LSR	LSR, ERA	LSR, ERA
Measures and actions:	ST2A1, ST2A2	ST3A1, ST3A2, ST3A3, ST3A5, ST3A6	ST4A1, ST4A2, ST4A3, ST4A4, ST4A5, ST4A6
Potential bypasses:	L3B1 - P15 Ainaži-Matīši - P13 Limbaži-Aloja - P11 Kocēni-Limbaži-Tūja		
Waiting areas for HGV:	From north P13 Ikla, P14 Ainaži III, P17 Neste Ainaži, from south no areas		
TECHNICAL ASPECTS			
Communication between partners:	e-mail, phone		
Roadside systems and systems to inform the road users:	Variable message signs, www, social media, press releases		

Table 6 Example 1 - Operational part of TMP, partial road closure in Latvia

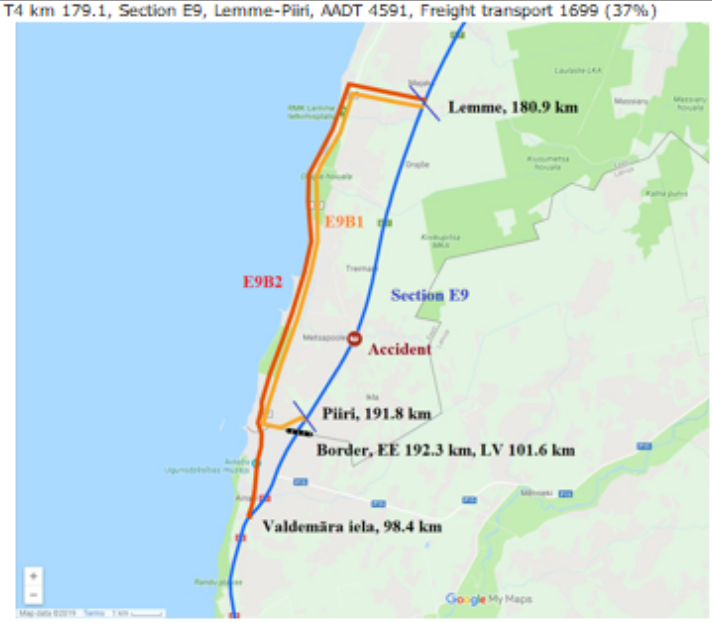
OPERATIONAL APPROACH			
Event/incident name:	**Total road closure (accident)**		
Time:	01.07.2019 12:05:00		
Type/description:	Two HGV accident		
Location:	T4 km 179.1, Section E9, Lemme-Piiri, AADT 4591, Freight transport 1699 (37%)  		
Traffic impact:	Road closed for both directions, potential need for rerouting		
Expected duration:	1 - 6 hours		
Weather conditions:	Satisfactory weather conditions SW1		
Scenario name:	ST3	ST4	ST5
Spatial application:	T4 km 180.9 - A1 km 98.4	T4 km 180.9 - A1 km 98.4	T4 km 180.9 - A1 km 98.4
Treshold for activation:	delay 30 - 60 min	delay 60 - 120 min	delay > 120 min
Treshold for deactivation:	delay < 30 min	delay < 60 min	delay < 120 min
Organisations involved:	ERA, LSR	ERA, LSR	ERA, LSR
Measures and actions:	ST3A1, ST3A2, ST3A3, ST3A5, ST3A6	ST4A1, ST4A2, ST4A3, ST4A4, ST4A5, ST4A6	ST5A1, ST5A2, ST5A3, ST5A4, ST5A5, ST5A6
Potential bypasses:	E9B1 - T19338 Lemme tee - T19331 Rannametsa-Ikla - T19348 Ikla-Piiri E9B2 - T19338 Lemme tee - T19331 Rannametsa-Ikla - Valdemara iela		
Waiting areas for HGV:	From North P6 Metsaküla, from South P13 Ikla, P14 Ainaži III, P17 Neste Ainaži		
TECHNICAL ASPECTS			
Communication between partners:	e-mail, phone		
Roadside systems and systems to inform the road users:	Variable message signs, www, social media, press releases		

Table 7 Example 2 - Operational part of TMP, total road closure in Estonia

6. LIST OF INFORMATION SOURCES

1. EasyWay Deployment Guideline “Traffic Management Plan for Corridors and networks”, Version 02-02-00, December 2015
2. Traffic Management Plan example “URSA MAJOR -FACTSHEET FOR TMP for long distance transport”
3. Estonian guide - Setting and Terminating Heavy (Winter) Weather Conditions
4. Estonian guide – Events-related activities
5. Estonian guide - Process description: providing 1510 services
6. Latvian guide - TIC dispatching service instruction
7. Latvian guide - Crisis communication arrangements
8. Estonian VMS management principles
9. Latvian VMS management principles
10. https://lvceli.lv/
11. https://tarktee.ee
12. https://www.google.com/maps/
13. https://www.balticmaps.eu/#
14. https://www.meteoalarm.eu/
15. https://www.ilmateenistus.ee/ilmatarkus/kasulik-teada/hoiatuste-kriteeriumid/
16. https://www.meteo.lv/en/bridinajumi/?nid=679
17. http://www.meteo.lt/php/SGRIPS2/prog_failai/sgrips/PR_meteo.lt.pdf
18. https://en.ilmatieteenlaitos.fi/meteoalarm
19. https://www.smhi.se/vadret/vadret-i-sverige/varningsdefinitioner
20. Facebook Group “Liiklus- ja patrullinfo Pärnus”
21. https://www.mapillary.com/app/
22. Håndbok V321 - Variable trafikkskilt
23. Vaihtuvien_opasteiden_käyttö_30122009-final.doc

PART II

ANALYSIS OF VMS MANAGEMENT PRINCIPLES ON E67

RECOMMENDATIONS FOR HARMONIZATION OF VMS MANAGEMENT PRINCIPLES

In both countries VMS management principles have been recently developed. The working principles are slightly different. In Latvia VMSs are installed beside the road weather station (RWS) and the VMS-RWS pair mainly works locally in automatic operational mode. The VMS shows a warning when the station next to it measure certain values. In Estonia the VMS and RWS are usually not installed side by side, and the management of signs is done through a central software application where all road weather data is collected and analysed. Each VMS still has its master and backup RWS to access characteristic values for decision making.

Although the road weather stations are produced by Vaisala Oy in both countries, there are some differences in their working principles. In Estonia most of the stations have embedded road surface sensors and some additional optical sensors. In Latvia only optical road surface sensors are in use. This factor plays an important role in why the same decision making principles cannot always be used; it is because different road surface parameters are used.

For comparison and analysis the Estonian and Latvian VMS management principle tables were combined. The first table is for comparison of Estonian management principles with the Latvian VMSs where only warning signs are in use (see Annex 4). The second table compares Estonian management rules with Latvian stations where the VMS is combined with speed limit signs in Ādaži and Tūja (see Annex 5).

Within the comparison process, several findings were collected and recommendations prepared for VMS management principle harmonization. Those recommendations are divided into four groups because in Estonia road conditions are structured and rules are applied in four main groups:

- Good driving conditions
- Satisfactory driving conditions
- Poor driving conditions
- Dangerous driving conditions

1. Good driving conditions (usually no warnings or speed reduction)

1.1. Allow frost with very low layer thickness (0.01 mm) for Latvia. Historical data to be analysed before final decision.

1.2. The water layer thickness has different limits, but because different sensor types are in use, changes cannot be made (embedded in Estonia, optical in Latvia). Consider using the higher (Latvian) limit if only the optical sensor is used in Estonia.

1.3. Consider ice layer and snow layer parameter use in Estonia if only optical sensor data is available. Historical data to be analysed before final decision.

1.4. Consider friction warning level harmonization at level 0.5. In Latvia the system gives a warning if friction is below 0.4 and speed reduction is below 0.3. In Estonia a warning is given if friction is below 0.6 and speed reduction is below 0.3.

1.5. In Latvia sleet or snowy conditions are considered good conditions in typical VMS+RWS spots. In VMS+RWS+VSL spots sleet or snowy conditions are considered satisfactory conditions (VSL shows 90 km/h).

1.6. Minimum good visibility in Estonia is 600 m and in Latvia 300 m. Consider using the same value.

1.7. In Latvia the maximum wind speed is not a parameter to be followed in typical VMS+RWS spots (always good conditions?). In VMS+RWS+VSL spots a speed above 17 m/s considered to be poor conditions (VSL is 70 km/h).

2. Satisfactory driving conditions (warnings, no speed reduction)

2.1. In Estonia with weak precipitation of snow or sleet (<= 1 mm/h), the slippery road warning is issued. In Latvia no warning is issued with precipitation of snow or rain showers, but the speed limit 90 km/h warning is issued if the road is dry, moist or wet. Sleet is to be considered as equal to snow in Latvian conditions. Consider using the precipitation accumulation parameter instead of precipitation intensity in both countries. The slippery road warning is to be used instead of the speed limit 90 km/h warning in Latvia.

2.2. In Estonia frost conditions are considered satisfactory conditions and the slippery road warning is issued. In Latvia frost means poor conditions with a speed reduction to 70 km/h. Consider raising frost conditions up to satisfactory conditions with a slippery warning but without a speed reduction in Latvia.

2.3. In Estonia an average wind speed over 12 m/s or a maximum wind speed over 17 m/s means satisfactory conditions, while in Latvia these are poor conditions in sections with a speed limit. Consider raising the Latvian conditions to satisfactory level.

2.4. In Estonia rain with an intensity between 1 mm/h and 2.5 mm/h means aquaplaning risk and satisfactory conditions with a danger warning. In Latvia rain means good conditions and rain showers satisfactory conditions. As rain showers are not measurable by the stations in use, consider using the accumulation parameter to measure the precipitation intensity instead.

3. Poor driving conditions (warnings and speed reductions)

3.1. In Estonia snow, ice or slush with low layer thickness (<= 1mm) means satisfactory conditions but in Latvia it means poor conditions a with speed reduction to 70 km/h even if the layer thickness level is below the slippery warning sign threshold. Consider using satisfactory conditions when the layer thickness is below the threshold values of corresponding layers.

3.2. In Estonia snow or sleet precipitation with an intensity of more than 1 mm/h means a potential risk of roads being slippery and in addition to the slippery road warning, a speed reduction warning is implemented. According to the Latvian rules, precipitation intensity is not a criterion used, but it should be, like in Estonia.

3.3. In Estonia rain with an intensity of over 2.5 mm/h means high aquaplaning risk and poor conditions with a danger warning and speed reduction to 80 km/h. In Latvia numerical values are not in use to characterize the rain. Consider using the rain accumulation parameter instead of intensity to assess the aquaplaning risk.

3.4. The speed limit for poor road conditions in Estonia is 80 km/h in 1+1 road sections, while for similar conditions in Latvia the speed limit is 70 km/h. It is advisable to observe weather and traffic conditions to find out optimal speed limits and to set up similar steps for similar conditions.

4. Dangerous driving conditions

4.1. In Estonia freezing rain means dangerous conditions and a speed reduction to 60 km/h. In Latvia freezing rain means poor conditions and a speed reduction to 70 km/h. As Latvian stations have PWD12 precipitation sensors, they may not distinguish between rain and freezing rain. Because freezing rain could cause extremely dangerous situations, it is highly recommended to find opportunities to upgrade the sensors to detect freezing rain and freezing drizzle.

Other comments

1. In Latvia freezing rain is the threshold for the danger warning sign, while in Estonia freezing drizzle and freezing rain both mean that a slippery road warning must be issued. Consider using slippery road warning signs in Latvia.

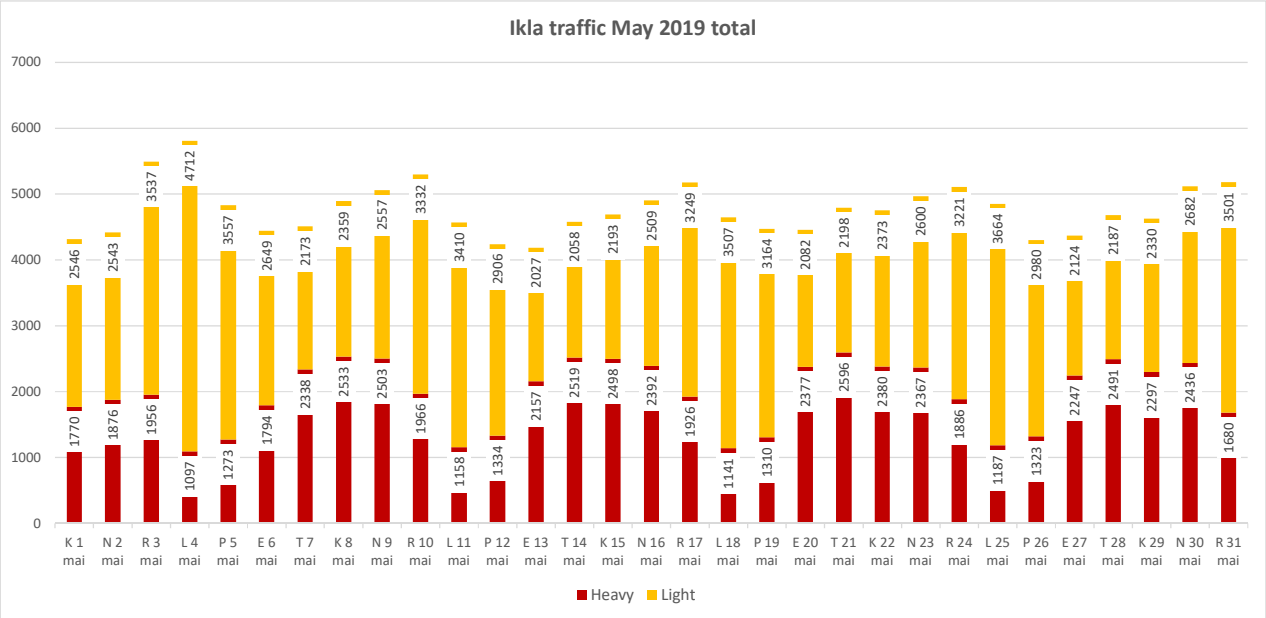
2. In Latvia fog and haze (smoke, sand) require issuing a danger warning. Visibility in meters is the recommended parameter for issuing visibility warnings.

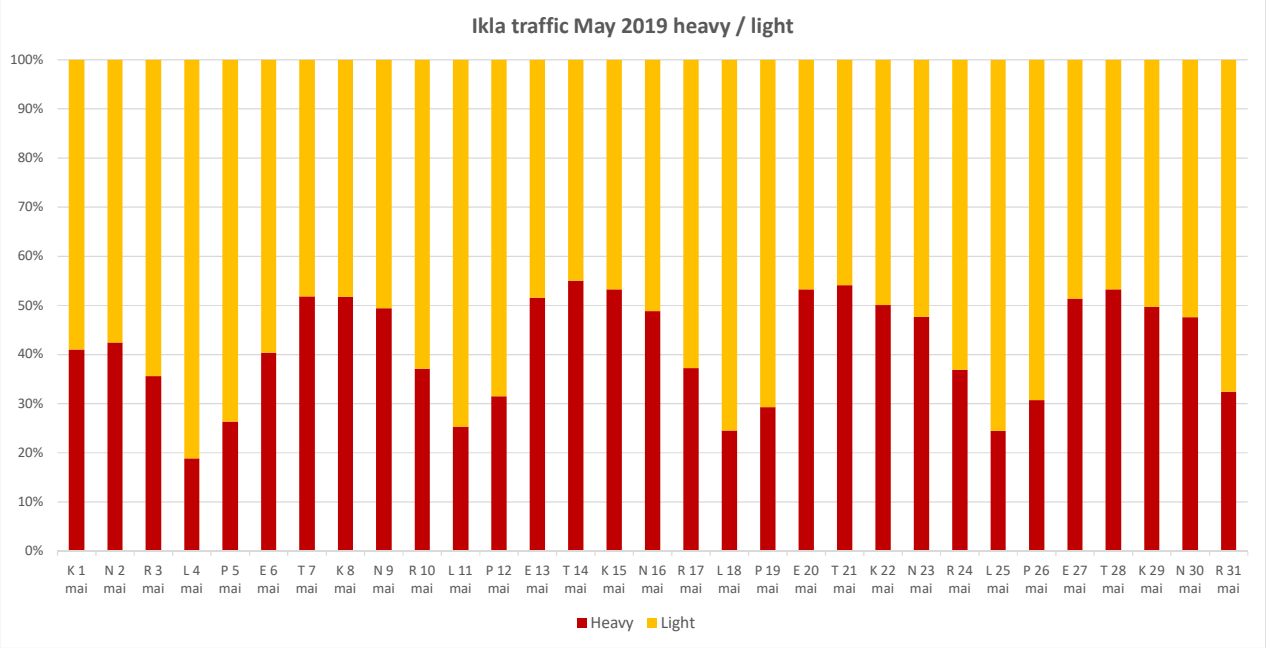
3. Try to use similar wording to characterize the driving conditions. It is recommended to use the categories of good, satisfactory, poor or dangerous for driving conditions in English.

TRAFFIC IN CROSS-BORDER SECTION

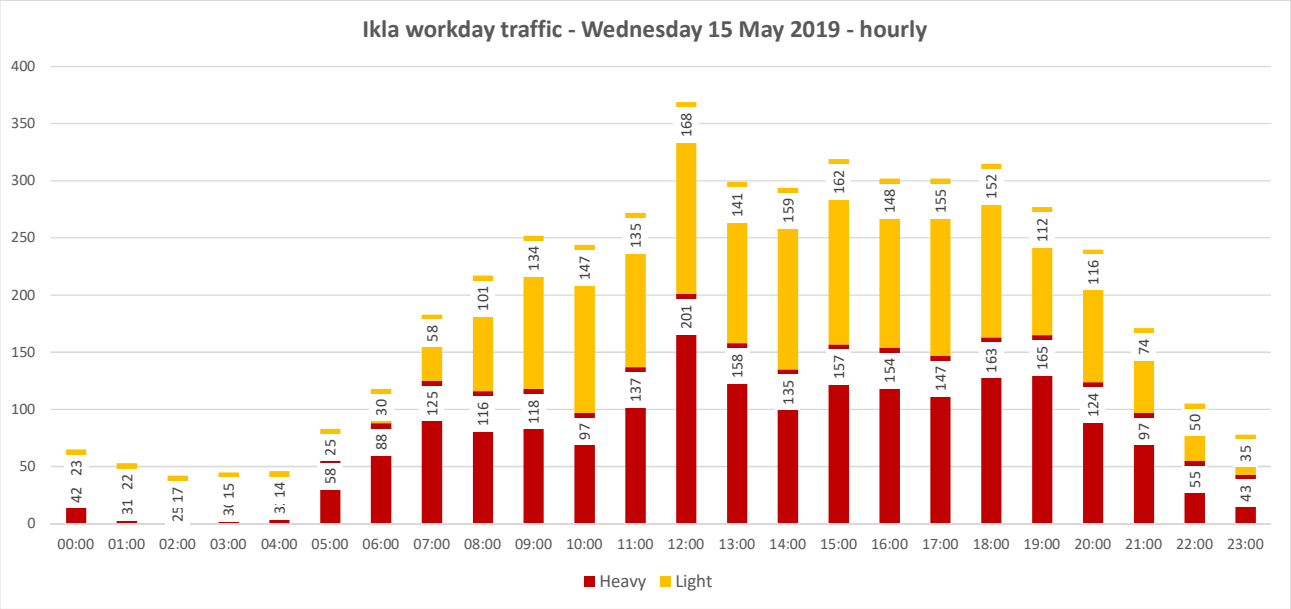
road	section start	section end	section name	AADT	Freight Transport	Freight Transport	HGV / LGV %	RIGID / COACH %	CAR/VAN/ MC %
4	133.443	141.421	Pärnu-Uulu	10 828	2 166	20	17	3	80
4	141.421	152.441	Uulu-Võiste	5 666	1 756	31	27	4	69
4	152.441	168.825	Võiste-Häädemeeste	4 653	1 535	33	29	4	67
4	168.825	192.282	Häädemeeste-Ikla	4 591	1 699	37	34	3	63
	192.3/101.6		Ikla / Ainaži						
A1	83.875	101.737	Salacgrīva-Ainaži	4 573	1 966	43			
A1	57.677	83.875	Tuja-Salacgrīva	5 555	2 444	44			
A1	40.41	57.677	Skulte-Tuja	6 670	2 268	34			

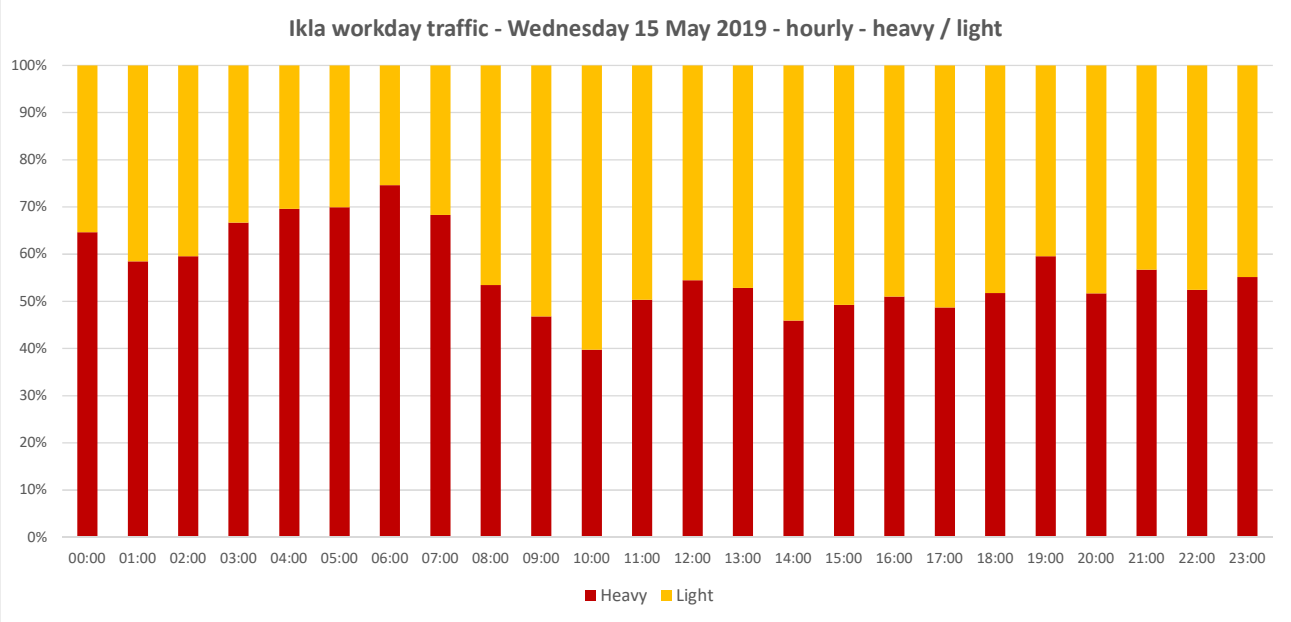
IKLA TRAFFIC MONITORING STATION MONTHLY TRAFFIC DEVIATION



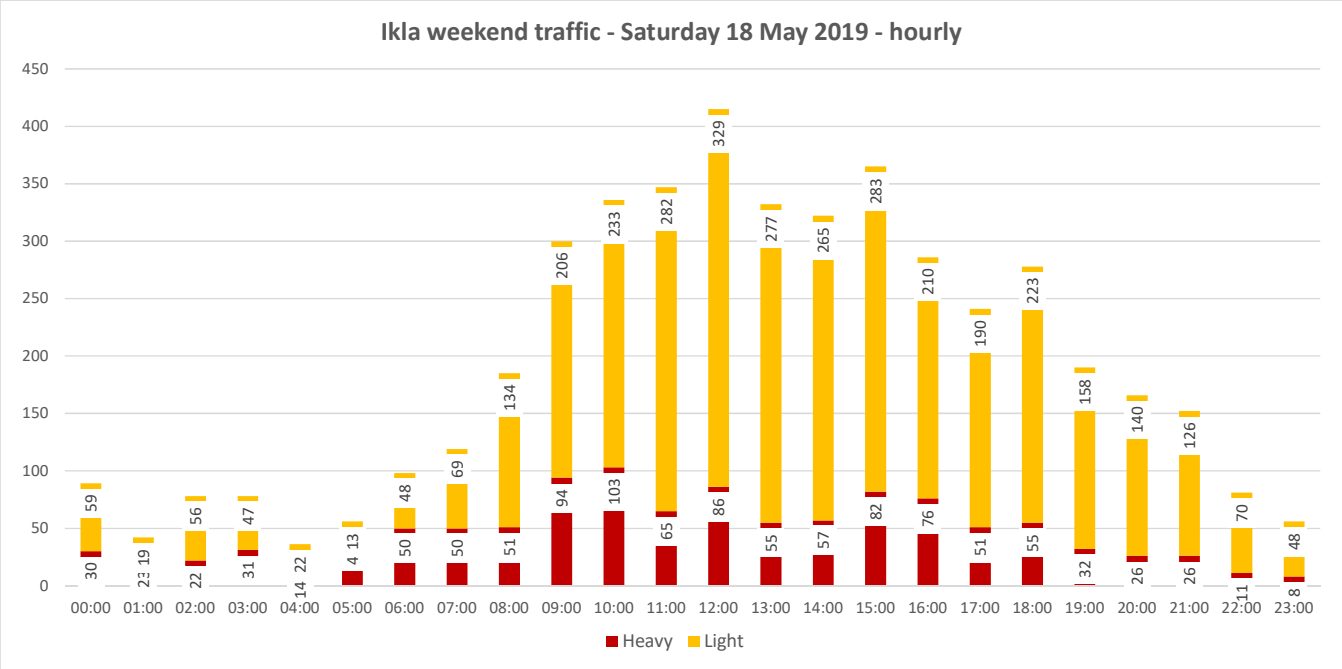


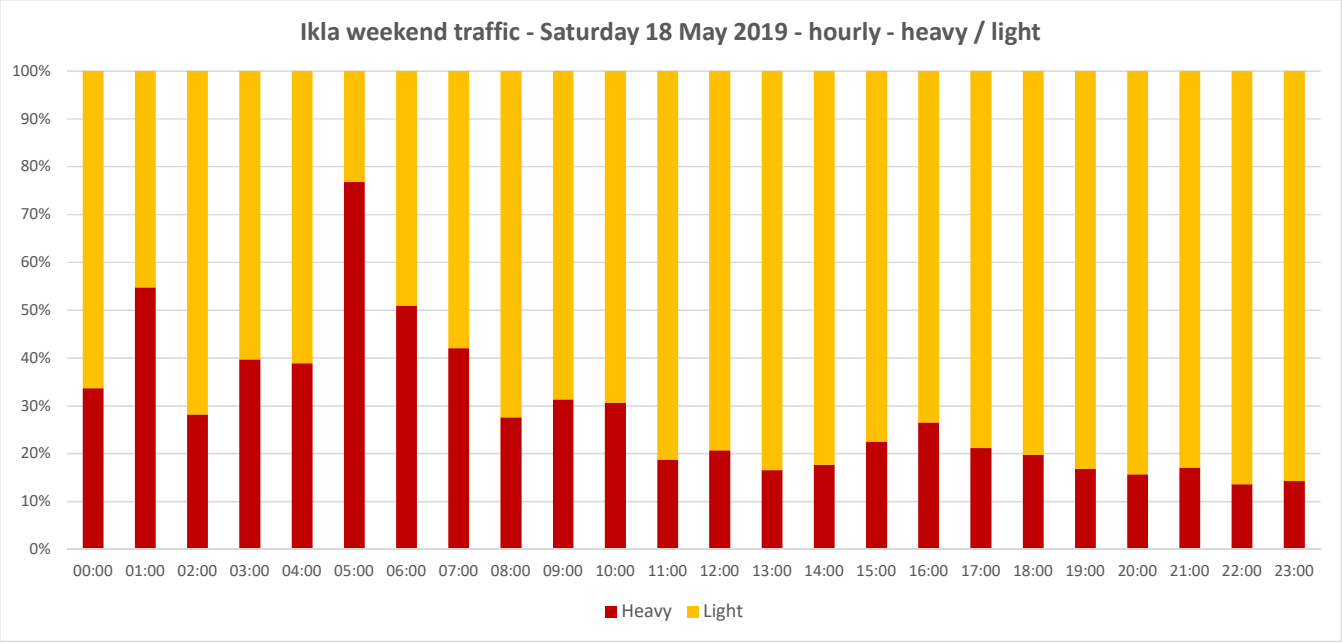
IKLA TRAFFIC MONITORING STATION WORKDAY TRAFFIC DEVIATION

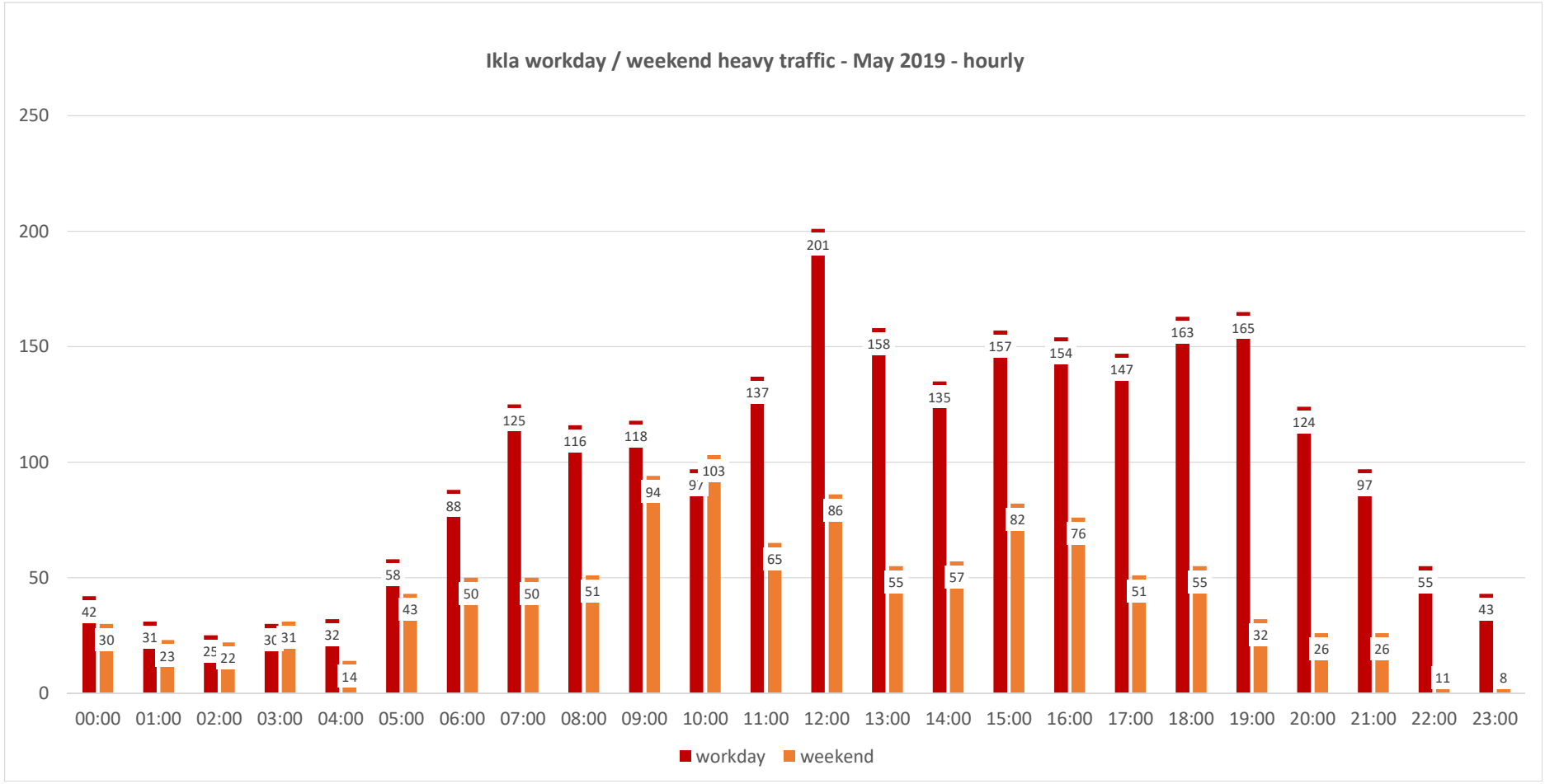




IKLA TRAFFIC MONITORING STATION WEEKEND TRAFFIC DEVIATION






Ikla workday / weekend heavy traffic - May 2019 - hourly
250
200
150
100
50
0
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00
42 30
31 23
25 22
30 31
32 14
58 43
88 50
125 50
116 51
118 94
97 103
137 65
201 86
158 55
135 57
157 82
154 76
147 51
163 55
165 32
124 26
97 26
55 11
43 8
workday
weekend

ROAD WEATHER STATIONS IN CROSS-BORDER SECTION

Road no	Road name	KM	Direction	Location	VMS	Camera	X	Y	Average Distance
4	Tallinn - Pärnu - Ikla	130.7	S	Papiniidu	Y	Y (only for TMC)	58.378424	24.555619	19.8
4	Tallinn - Pärnu - Ikla	133.5				E67 Pärnu-Skulte section start			
4	Tallinn - Pärnu - Ikla	150.5	N	Võiste	N	N	58.22982	24.50109	38.2
4	Tallinn - Pärnu - Ikla	188.7	N	Ikla	N	Y	57.90175	24.41222	
4 / A1		192.3 / 101.7				E67 / 4 / A1 Estonian-Latvian border			**29.0**
A1	Rīga - Ainaži	96.8	S	Ainaži	Y	Y	57.84386	24.34979	24.5
A1	Rīga - Ainaži	72.3	S	Vitrupe	Y	Y	57.62148	24.38734	14.8
A1	Rīga - Ainaži	57.5	N	Tūja	Y	Y	57.49706	24.43119	11.9
A1	Rīga - Ainaži	45.6	N	Dunte	Y	Y	57.38852	24.42901	6.4
A1	Rīga - Ainaži	40.3				E67 Pärnu-Skulte section end			**14.4**
A1	Rīga - Ainaži	39.2	N	Skulte	Y	Y	57.33484	24.45543	

WEATHER SCENARIOS ACTIVATION CRITERIA

Weather Services weather classification	Meteoalarm WMO CAP Severity Austria Sweden	**potentially dangerous** moderate Be aware! difficult weather	consequence	**dangerous** severe Be prepared! very difficult weather	consequence	**very dangerous** extreme Take action! extreme weather	consequence
max wind speed, m/s	**Estonia**	>=15 inland*; >=20 coast		>=25		>=33	
	Latvia	20-24		25-32		>=33	
	Lithuania	15-27		28-33		>=33	
	Finland	>=15 summer; >=20 in winter		>=20 summer; >=25 in winter		>=25 summer; >=30 in winter	
	Sweden	21-25	Problems for high vehicles	25-30	Problems for high vehicles	>=30	Problems for high vehicles
snowfall ***	**Estonia**	> 5 cm / 6 h or > 7 cm 6 h*	Risk of slipping on roads	<= 20 cm /12 h or >= 20 cm / 12 h* or 12 cm / 12 h + max wind >= 15 m/s	Risk of slipping on roads		
	Latvia	7 - 14 mm or 5 - 9 cm / 12 h		15 - 24 mm or 10 - 14 cm / 12 h		>= 25 mm or >= 15 cm	
	Lithuania	7 - 19 mm / 12 h		20 - 30 mm / 12 h		> 30 mm / 12 h	
	Sweden	from 5 mm / 6 h to 20 mm / 12 h or 12 mm / 12 h + wind >= 8 m/s	Risk of slipping on roads Risk of slipping on roads	20 - 35 mm / 12 h 12 - 25 mm / 12h + wind >= 8 m/s	Major traffic problems Major traffic problems	>= 35 mm / 12 h >= 25 mm / 12h + wind >= 8 m/s	Major traffic problems Major traffic problems
sudden ice slipperiness	**Estonia**	rain followed by fast air temp. decrease below 0°C ice rain >= 3 mm / 6 h*	Risk of slipping on roads Risk of slipping on roads				
	Latvia	freezing precipitation intensity 0,5-1 mm during 12 hours		freezing precipitation intensity 1-4 mm during 12 hours		freezing precipitation intensity ≥ 5 mm during 12 hours	
	Finland	snow/ice	Bad (winter) road weather conditions	snow/ice	Very bad (winter) road weather conditions		
	Sweden	ice rain, rain on cold road, rain followed by fast freezing surfaces	Risk of slipping on roads	ice rain >= 3 mm / 6 h	Risk of slipping on roads		
heavy rain	**Estonia**	15 - 49 mm / 12 h		>= 50 mm / 12 h			
	Latvia	20 - 39 mm / 12 h		40 - 59 mm / 12 h		> 60 mm / 12 h	
	Lithuania	15 - 49 mm / 12 h		50 - 80 mm / 12 h		> 80 mm / 12 h	
	Finland	>= 20 mm / h or >= 50 mm / 24 h		>= 30 mm / h or >= 70 mm / 24 h		>= 45 mm / h or >= 120 mm / 24 h	
	Sweden	from 35 mm / 12 h to 70 mm / 24 h		over 70 mm / 24 h			
blizzard	**Latvia**	visibility during snowfall < 4 km & wind gusts ≥ 15 m/s < 3 hours		visibility during snowfall < 2 km and wind gusts 15-19 m/s ≥ 3 h		visibility during snowfall < 2 km and wind gusts ≥ 20 m/s ≥ 3 h	
	Lithuania	average wind 8 - 14 m/s & visibility <= 1000 m / 3 h		average wind 15 - 20 m/s & visibility <= 1000 m / 12 h		aver. wind > 20 m/s & visibility <= 500 m / 1 h	

	Additional regulations in Estonia	**Difficult weather conditions for roads******	continous snowfall from 10 cm / 4 h or 5 cm / 4 h + max wind >= 12 m/s	**Recovery scenarious and action plans for continous snowfall or blizzard**	1) dangerous weather snowfall 7-19 cm / 12 h 2) ice forming (glaze) rain or high hum. on cold road 3) snowstorm snowfall and max wind 15 m/s		

* - 30% of territory
** - cm snow
*** - unit mm/h mean snow amount in water eqvivalent
**** - regulation

Sign			Estonia						Latvia		
	driving condition	speed reduction	sensor	main parameter	value	& additional parameter	sensor	value	sensor	parameter	value
No warning	Good	No	DRS511	road surface state	dry, moist, wet				DSC211	road surface state	dry, moist, wet
					wet & salt						
					moist & salt						
					frost	water layer thickness[1]	DRS511	<=0.01 mm			
				water layer thickness	water layer <=0.2 mm					water layer	<= 0.9 mm
										ice layer	<= 0.2 mm
										snow layer	<= 2 mm
			DSC111	friction	> 0.6					friction	>= 0.4
			PWD22	precipitation type	clear, rain, drizzle	precipitation intensity	PWD22	<= 1 mm	PWD12	precipitation type	clear, rain, drizzle, **sleet, snow**
			PWD22	visibility	>= 600 m				PWD12	visibility	>= 300 m
			WMT700	average wind speed	<= 12 m/s				WMT700	average wind speed	<= 12 m/s
			WMT700	max wind speed	<= 17 m/s						
Slippery road 	Satisfactory driving condition	No	DRS511 / DSC111	road surface state	snow, ice, slush	water layer thickness[1]	DRS511	<= 1 mm	DSC211	road surface state	snow, ice, slush, frost
					frost	water layer thickness[1]	DRS511	> 0.01 mm			
				friction	< 0.6 & >= 0.3					friction	< 0.4
										water layer	> 0.9 mm
										ice layer	> 0.2 mm
										snow layer	> 2 mm
			DRS511 / HMP155	road surface temperature, dew point temperature	road surface temperature - dew point temperature < 0˚C	water layer thickness[1] &	DRS511	> 0.01 mm			
						road surface temperature &		< 0˚C			
						road surface state		≠ wet & salt			
			PWD22	precipitation type	snow or sleet	precipitation intensity	PWD22	> 0 & <= 1 mm/h			
Slippery road 	Poor driving conditions	In Estonia 	DRS511 / DSC111	road surface state	snow, ice, slush	water layer thickness[1]	DRS511	> 1 mm			
				friction	< 0.3 & >= 0.15						
			PWD22	precipitation type	freezing drizzle						
					snow or sleet	precipitation intensity	PWD22	> 1 mm/h			
			WMT700	wind speed	V_{aver} > 12 OR V_{max} > 17 m/s	road surface state & water layer thickness[1]	DRS511	snow, ice, slush			
								<= 1 mm			
Slippery road 	Very poor / dangerous driving conditions	In Estonia 	DSC111	friction	< 0.15						
			PWD22	precipitation type	freezing rain	precipitation intensity	PWD22	> 0 mm/h			
Side wind 	Satisfactory driving condition	No	WMT700	wind speed	V_{aver} > 12 OR V_{max} > 17 m/s				WMT700	wind speed	V_{aver} > 12 m/s
Danger 	Satisfactory driving condition	No	PWD22	precipitation intensity	> 1 & <= 2.5 mm/h	road surface state	DRS511	wet & salt	PWD12	precipitation type	freezing rain, fog, haze (smoke, sand)
				visibility	< 300 & >= 200 m					visibility	< 300 m
Danger 	Poor driving condition	In Estonia 	PWD22	precipitation intensity	> 2.5 mm/h	road surface state	DRS511	wet or wet & salt			
				visibility	< 200 & >= 100 m						
Danger 	Very poor / dangerous driving conditions	In Estonia 	PWD22	visibility	< 100 m						

Sign			Estonia						Latvia					
	driving condition	speed reduction	sensor	main parameter	value	& additional parameter	sensor	value	sensor	parameter	value	& additional parameter	sensor	value
No warning	Good[2]	No	DRS511	road surface state	dry, moist, wet				DSC211	road surface state	dry, moist, wet	friction &	DSC211	>= 0.4
					wet & salt							water layer &		<= 0.9 mm
					moist & salt							road surface temp. &	DST111	>= 2˚C
					frost	water layer thickness[1]	DRS511	<=0.01 mm				visibility &	PWD12	> 300 m
				water layer thickness	water layer <=0.2 mm							precipitation type &		clear, rain, drizzle
			DSC111	friction	> 0.6									
			PWD22	precipitation type	clear, rain, drizzle	precipitation intensity	PWD22	<= 1 mm				average wind speed &	WMT700	<= 12 m/s
			PWD22	visibility	>= 600 m							max wind speed		<= 17 m/s
			WMT700	average wind speed	<= 12 m/s									
			WMT700	max wind speed	<= 17 m/s									
	Satisfactory driving condition	Latvia 90 km/h							DSC211	road surface state	dry, moist, wet	road surface temp.	DST111	< 2˚C
									PWD12	precipitation type	snow **or rain showers**			
Slippery road	Satisfactory driving condition	Latvia 90 km/h	DRS511 / DSC111	road surface state	snow, ice, slush	water layer thickness[1]	DRS511	<= 1 mm						
					frost	water layer thickness[1]	DRS511	> 0.01 mm						
				friction	< 0.6 & >= 0.3				DSC211	friction	< 0.4 & >= 0.3			
			DRS511 / HMP155	road surface temperature, dew point temperature	road surface temperature dew point temperature < 0˚C	water layer thickness[1] &	DRS511	> 0.01 mm						
						road surface temperature &		< 0˚C						
						road surface state		≠ wet & salt						
			PWD22	precipitation type	snow or sleet	precipitation intensity	PWD22	> 0 & <= 1 mm/h						
Slippery road	Poor driving conditions	Estonia 80 km/h Latvia 70 km/h	DRS511 / DSC111	road surface state	snow, ice, slush	water layer thickness[1]	DRS511	> 1 mm	DSC211	road surface state	snow, ice, slush, frost			
				friction	< 0.3 & >= 0.15					friction	< 0.3 & >= 0.15			
			PWD22	precipitation type	freezing drizzle									
					snow or sleet	precipitation intensity	PWD22	> 1 mm/h						
			WMT700	wind speed	V_{aver} > 12 OR V_{max} > 17 m/s	road surface state & water layer thickness[1]	DRS511	snow, ice, slush						
								<= 1 mm						
Slippery road	Very poor / dangerous driving conditions	Estonia 60 km/h Latvia 50 km/h	DSC111	friction	< 0.15				DSC211	road surface state	snow, ice, slush, frost	DSC211	friction	< 0.15
			PWD22	precipitation type	freezing rain	precipitation intensity	PWD22	> 0 mm/h						
Side wind	Satisfactory driving condition	No	WMT700	wind speed	V_{aver} > 12 OR V_{max} > 17 m/s									
Side wind	Poor driving condition	In Latvia 70 km/h							WMT700	wind speed	V_{aver} > 12 OR V_{max} > 17 m/s			
Danger	Satisfactory driving condition	No	PWD22	precipitation intensity	> 1 & <= 2.5 mm/h	road surface state	DRS511	wet & salt	PWD12	precipitation type	fog, haze (smoke, sand)			
				visibility	< 300 & >= 200 m					visibility	< 300 & >= 200 m			
Danger	Poor driving condition	In Estonia 80 km/h In Latvia 70 km/h	PWD22	precipitation intensity	> 2.5 mm/h	road surface state	DRS511	wet or wet & salt	PWD12	precipitation type	freezing rain			
				visibility	< 200 & >= 100 m					visibility	< 200 & >= 100 m			
Danger	Very poor / dangerous driving conditions	In Estonia 60 km/h In Latvia 50 km/h	PWD22	visibility	< 100 m				PWD12	visibility	< 100 m			

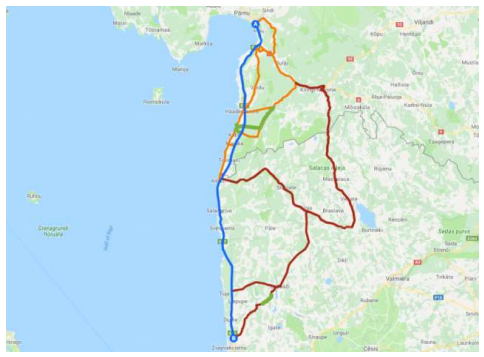
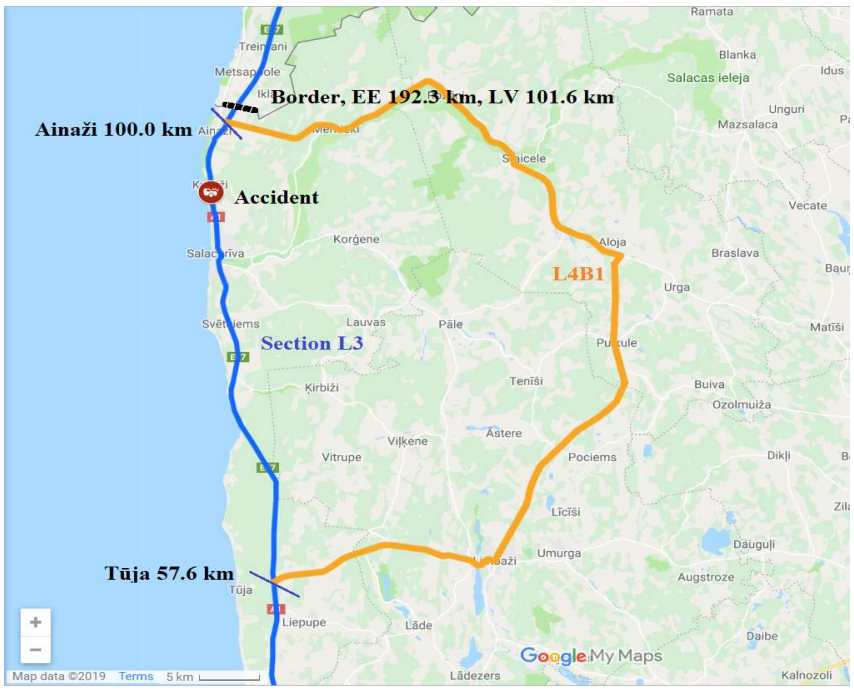
ROAD SECTIONS AND BYPASSES

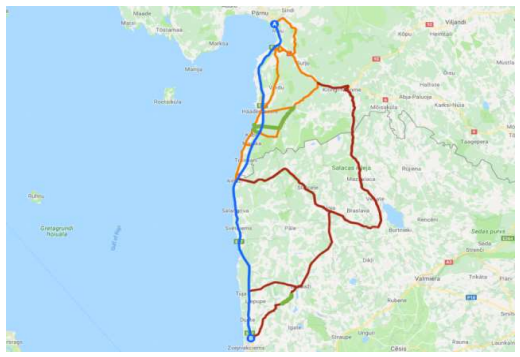
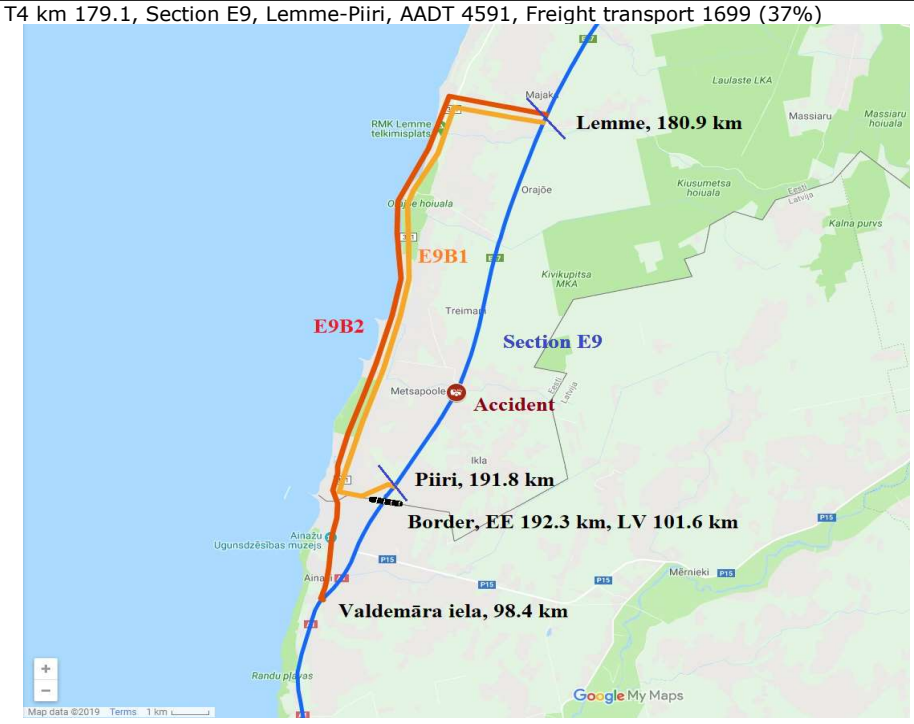
Section index	Road no	Section name	Start KM	End KM	Lenght	From start	Bypasses roads	Bypass index	Lenght	Distance difference	%	Main road travel time	Bypass travel time	Time difference
E1	T4	T59 Raeküla - T6 Mereküla	133.4	141.4	8.0	8.0	T59 Pärnu-Tori - T19277 Paikuse-Tammuru - T19343 Surju-Seljamets - T6 Valga-Uulu	**E1B1**	25.4	17.4	318%	6	21	**15**
E2	T4	T6 Mereküla - T19333 Uulu	141.4	143.1	1.7	9.7	T6 Valga-Uulu - T19340 Uulu-Laadi - T19333 Uulu-Soometsa-Häädemeeste	**E2B1**	6.6	22.0	384%	1	7	**6**
E3	T4	T19333 Uulu - T19331 Rannametsa	143.1	162.1	19.0	28.7	T19333 Uulu-Soometsa-Häädemeeste	**E3B1**	23.6	-0.3	124%	13	20	**7**
E4	T4	T19331 Rannametsa - T19333 Häädemeeste	162.1	167.1	5.0	33.6	T19331 Rannametsa-Ikla - T19333 Uulu-Soomesa-Häädemeeste	**E4B1**	5.4	0.4	109%	3	5	**2**
E5	T4	T19333 Häädemeeste - T19330 Tõitoja	167.1	168.3	1.2	34.8	T19333 Uulu-Soomesa-Häädemeeste - T19331 Rannametsa-Ikla - T19330 Tõitoja-Häädemeeste	**E5B1**	2.4	1.2	198%	1	4	**3**
E6	T4	T19330 Tõitoja - T19335 Jaagupi	168.3	173.3	5.0	39.8	B1. T19330 Tõitoja-Häädemeeste - T19331 Rannametsa-Ikla - T19338 Lemme tee	**E6B1**	16	3.4	127%	8	15	**7**
							B2. T19330 Tõitoja-Häädemeeste - T19331 Rannametsa-Ikla - T19335 Jaagupi-Urissaare*	**E6B2**	8.9	3.9	179%	3	9	**6**
E7	T4	T19335 Jaagupi - T19336 Kabli	173.3	175.7	2.4	42.2	B1. T19330 Tõitoja-Häädemeeste - T19331 Rannametsa-Ikla - T19338 Lemme tee	**E7B1**	16	3.4	127%	8	15	**7**
							B2. T19335 Jaagupi-Urissaare* - T19331 Rannametsa-Ikla - T19336 Kabli-Massiaru*	**E7B2**	7	4.6	290%	2	9	**7**
E8	T4	T19336 Kabli - T19338 Lemme	175.7	180.9	5.2	47.5	B1. T19330 Tõitoja-Häädemeeste - T19331 Rannametsa-Ikla - T19338 Lemme tee	**E8B1**	16	3.4	127%	8	15	**7**
							B2. T19336 Kabli-Massiaru* - T19331 Rannametsa-Ikla - T19338 Lemme tee	**E8B2**	10.9	5.7	209%	3	11	**8**
E9	T4	T19338 Lemme - T19348 Piiri	180.9	191.8	10.9	58.4	B1. T19338 Lemme tee - T19331 Rannametsa-Ikla - T19348 Ikla-Piiri	**E9B1**	15	4.1	137%	7	15	**8**
							B2. T19338 Lemme tee - T19331 Rannametsa-Ikla - Valdemara iela	**E9B2**	16.6	2.0	114%	10	17	**7**
E10	T4	T19348 Piiri - Border	191.8	192.3	0.5	**58.8**								
L1	A1	Border - P15 Ainaži	101.6	100	1.6	**61.3**	T19348 Ikla-Piiri - T19331 Rannametsa-Ikla - Valdemara iela	**L1B1**	4.6	0.9	126%	3	8	**5**
L2	A1	P15 Ainaži - Valdemara iela	100	98.4	1.6	59.7	T19348 Ikla-Piiri - T19331 Rannametsa-Ikla - Valdemara iela	**L2B1**	4.6	0.9	126%	3	8	**5**
L3	A1	Valdemara iela - P12 Salacgrīva	98.4	86.9	11.5	58.1	P15 Ainaži-Matīši - P13 Limbaži-Aloja - P11 Kocēni-Limbaži-Tūja	**L3B1**	90.6	48.2	214%	30	65	**35**
L4	A1	P12 Salacgrīva - P11 Tūja	86.9	57.6	29.3	46.6	P15 Ainaži-Matīši - P13 Limbaži-Aloja - P11 Kocēni-Limbaži-Tūja	**L4B1**	90.6	48.2	214%	30	65	**35**
L5	A1	P11 Tūja - V137 Jelgavkrasti	57.6	55	2.6	17.3	P11 Kocēni-Limbaži-Tūja - P53 Duči-Limbaži*	**L5B1**	44.5	27.2	257%	11	39	**28**
L6	A1	V137 Jelgavkrasti - V132 Priedulāji	55	45.3	9.7	14.7	P11 Kocēni-Limbaži-Tūja - P53 Duči-Limbaži*	**L6B1**	44.5	27.2	257%	11	39	**28**
L7	A1	V132 Priedulāji - P53 Skulte	45.3	40.3	5.0	5.0	P11 Kocēni-Limbaži-Tūja - P53 Duči-Limbaži*	**L7B1**	44.5	27.2	257%	11	39	**28**
				Est-Lat total:	**120.1**									
Major damages in both side of border, great bypass by Kilingi-Nõmme and Mazsalaca														
EL1		T6 **Mereküla** - Border	141.4	192.3	50.9		T6 Valga-Uulu - T19312 Kilingi-Nõmme tee - T19301 Kilingi-Nõmme-Tali-Laiksaare - T19302 Kilingi-Nõmme-Kiisa - Border	**EL1B1**	40.9			34	38	
		Border - P11 **Tūja**	101.6	57.6	44.0		Border - V164 Igaunijas robeža-Mazsalaca-Vilzēni-Dikļi - P16 Valmiera-Matīši-Mazsalaca - P15 Ainaži-Matīši - P13 Limbaži-Aloja - P11 Kocēni-Limbaži-Tūja		112			31	84	
				Total:	**94.9**			**Total:**	**152.9**	58.0	161%	65	122	**57**

* - incl. gravel section

PARKING FACILITIES ON CROSS-BORDER SECTION

Index	Road no	Road name	KM	Direction	Location	Area	Operator	Truck parking capacity
	4	Tallinn - Pärnu - Ikla	133.4	E67 Pärnu-Skulte section start				
P1	4	Tallinn - Pärnu - Ikla	135.1	N	Rae parkla	70	other	-
P2	4	Tallinn - Pärnu - Ikla	140.7	S	Reiu parkla	250	Maanteeamet	2
P3	4	Tallinn - Pärnu - Ikla	140.8	N	Reiu kohvik	800	private / Pärnamäed	-
P4	4	Tallinn - Pärnu - Ikla	143.0	N	Uulu parkla I	1000	Maanteeamet	3
P5	4	Tallinn - Pärnu - Ikla	143.1	S	Uulu parkla II	1400	Maanteeamet	5
P6	4	Tallinn - Pärnu - Ikla	148.4	S	Metsaküla parkla	1000	Maanteeamet	10
P7	4	Tallinn - Pärnu - Ikla	152.8	S	Võiste tankla	1100	private / Alexela	2
P8	4	Tallinn - Pärnu - Ikla	161.6	S	Rannametsa parkla I	830	Maanteeamet	3
P9	4	Tallinn - Pärnu - Ikla	161.6	N	Rannametsa parkla II	870	Maanteeamet	3
P10	4	Tallinn - Pärnu - Ikla	168.3	N	Häädemeeste	1500	private / CircleK	5
P11	4	Tallinn - Pärnu - Ikla	181.0	N	Majaka I	1300	Maanteeamet	3
P12	4	Tallinn - Pärnu - Ikla	181.1	S	Majaka II	1250	Maanteeamet	3
P13	4	Tallinn - Pärnu - Ikla	192.0	N	Ikla	10000	private / Ikla Kantiin	50
	4 / A1		192.3 / 101.6	E67 / 4 / A1 Estonian-Latvian border				
P14	A1	Rīga - Ainaži	101.6	S	Ainaži III	2000	private / Latvijas Nafta	10
P15	A1	Rīga - Ainaži	101.5	N	Ainaži II	500	private / Alko1000	5
P16	A1	Rīga - Ainaži	100.0	S	Ainaži I	4000	private / SuperAlko	-
P17	A1	Rīga - Ainaži	98.6	S	Neste Ainaži	1500	private / Neste	10
P18	A1	Rīga - Ainaži	97.7	N	Pļavas II	500	private / Rest. Pļavas	-
P19	A1	Rīga - Ainaži	96.6	S	Pļavas I	500	LSR	3
P20	A1	Rīga - Ainaži	88.0	N	Salacgrīva III	2000	private / CirkleK	8
P21	A1	Rīga - Ainaži	87.3	S	Salacgrīva II	1000	private / Salacgrīva	-
P22	A1	Rīga - Ainaži	86.4	N	Salacgrīva I	500	private / Lukoil	-
P23	A1	Rīga - Ainaži	74.2	S	Vitrupe III	2200	LSR	-
P24	A1	Rīga - Ainaži	73.0	S	Vitrupe II	1250	LSR	-
P25	A1	Rīga - Ainaži	72.4	S	Vitrupe I	2600	LSR	5
P26	A1	Rīga - Ainaži	65.9	S	Oltūži	1450	LSR	5
P27	A1	Rīga - Ainaži	54.4	S	Liepupes	800	LSR	-
P28	A1	Rīga - Ainaži	54.3	N	Sidrabiņi	700	LSR	-
P29	A1	Rīga - Ainaži	45.5	N	Skulte	500	private / Lukoil	-
	A1	Rīga - Ainaži	40.3	E67 Pärnu-Skulte section end				
		Section lenght total:	**120.3**	**km**				

GENERAL INFORMATION OF THE TRAFFIC MANAGEMENT PLAN			
Region:	CENTRAL BALTIC		
Name:	Cross-border TMP Pärnu-Skulte road section		
Status:	Under development		
Date of implementation:	-		
Initial situations:	Weather conditions, road works, major public events		
Traffic management measures are applied:	Information exchange, full or partial closure, traveller information, re-routing, HGV storage		
SPATIAL ASPECTS			
Expansion:	Cross-border		
Network involved:	Highway E67 Pärnu (Estonia) - Skulte (Latvia) section TMP; 120.3 km 		
ORGANISATIONAL ASPECTS			
Partners involved:	Estonian Road Administration, Latvian State Roads		
Regulatory framework:	Agreement to be signed		
OPERATIONAL APPROACH			
Event/incident name:	**Partial road closure (accident)**		
Time:	05.01.2019 12:05:00		
Type/description:	Two vehicle accident, one participant vehicle (HGV) disrupt traffic		
Location:	A1 km 92.3, Section L3, Valdemara iela - Salacgrīva, AADT 4573, Freight transport 1966 (43%) 		
Traffic impact:	temporary passage of traffic through one lane, congestion is likely to occur		
Expected duration:	1 - 3 hours		
Weather conditions:	Poor weather conditions SW2		
Scenario name:	ST2	ST3	ST4
Spatial application:	A1 km 57.6 - A1 km 100.0	A1 km 57.6 - A1 km 100.0	A1 km 57.6 - A1 km 100.0
Treshold for activation:	delay 10 - 30 min	delay 30 - 60 min	delay 60 - 120 min
Treshold for deactivation:	delay < 10 min	delay < 30 min	delay < 60 min
Organisations involved:	LSR	LSR, ERA	LSR, ERA
Measures and actions:	ST2A1, ST2A2	ST3A1, ST3A2, ST3A3, ST3A5, ST3A6	ST4A1, ST4A2, ST4A3, ST4A4, ST4A5, ST4A6
Potential bypasses:	L3B1 - P15 Ainaži-Matīši - P13 Limbaži-Aloja - P11 Kocēni-Limbaži-Tūja		
Waiting areas for HGV:	From north P13 Ikla, P14 Ainaži III, P17 Neste Ainaži, from south no areas		
TECHNICAL ASPECTS			
Communication between partners:	e-mail, phone		
Roadside systems and systems to inform the road users:	Variable message signs, www, social media, press releases		

GENERAL INFORMATION OF THE TRAFFIC MANAGEMENT PLAN			
Region:	CENTRAL BALTIC		
Name:	Cross-border TMP Pärnu-Skulte road section		
Status:	Under development		
Date of implementation:	-		
Initial situations:	Weather conditions, road works, major public events		
Traffic management measures are applied:	Information exchange, full or partial closure, traveller information, re-routing, HGV storage		
SPATIAL ASPECTS			
Expansion:	Cross-border		
Network involved:	Highway E67 Pärnu (Estonia) - Skulte (Latvia) section TMP; 120.3 km 		
ORGANISATIONAL ASPECTS			
Partners involved:	Estonian Road Administration, Latvian State Roads		
Regulatory framework:	Agreement to be signed		
OPERATIONAL APPROACH			
Event/incident name:	**Total road closure (accident)**		
Time:	01.07.2019 12:05:00		
Type/description:	Two HGV accident		
Location:	T4 km 179.1, Section E9, Lemme-Piiri, AADT 4591, Freight transport 1699 (37%) 		
Traffic impact:	Road closed for both directions, potential need for rerouting		
Expected duration:	1 - 6 hours		
Weather conditions:	Satisfactory weather conditions SW1		
Scenario name:	ST3	ST4	ST5
Spatial application:	T4 km 180.9 - A1 km 98.4	T4 km 180.9 - A1 km 98.4	T4 km 180.9 - A1 km 98.4
Treshold for activation:	delay 30 - 60 min	delay 60 - 120 min	delay > 120 min
Treshold for deactivation:	delay < 30 min	delay < 60 min	delay < 120 min
Organisations involved:	ERA, LSR	ERA, LSR	ERA, LSR
Measures and actions:	ST3A1, ST3A2, ST3A3, ST3A5, ST3A6	ST4A1, ST4A2, ST4A3, ST4A4, ST4A5, ST4A6	ST5A1, ST5A2, ST5A3, ST5A4, ST5A5, ST5A6
Potential bypasses:	E9B1 - T19338 Lemme tee - T19331 Rannametsa-Ikla - T19348 Ikla-Piiri E9B2 - T19338 Lemme tee - T19331 Rannametsa-Ikla - Valdemara iela		
Waiting areas for HGV:	From North P6 Metsaküla, from South P13 Ikla, P14 Ainaži III, P17 Neste Ainaži		
TECHNICAL ASPECTS			
Communication between partners:	e-mail, phone		
Roadside systems and systems to inform the road users:	Variable message signs, www, social media, press releases		