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Report under Directive 2010/40/EU

The following report provides an overview of the activities carried out by the Estonian administration in the field of road transport ITS and the implementation of the directive 2010/40/EU.

Before the adoption of the Directive 2010/40/EU Estonia had been developing a number of ITS solutions in the road sector for several years but they have not been a part of a specific ITS strategy. In the end of 2010 it was decided that a specific action plan for the development of ITS was needed and the Estonian Road Administration carried out a preliminary study to create a concept paper for ITS in road sector. In this study the current ITS solutions were surveyed, different management structures were presented and further activities were proposed. Based on this study Estonian Road Administration was appointed as the agency responsible for development and coordination of ITS in road sector in Estonia. Estonian Road Administration adopted the first action plan for ITS development in 2012 for the next five years. Since the development of ITS is so rapid though, in only two years it was agreed that an upgrade to the action plan was needed. Thus in the moment Estonian Road Administration is working on a new version of the plan for the next five years. Although the new version of the action plan is not adopted, this report is mainly based on the proposal.

Transposition of the directive 2010/40/EU

25.05.2012 the directive 2010/40/EU was transposed into Estonian law by changing the traffic act. The act was complemented with paragraphs that regulate how new ITS solutions/applications in the road sector have to be implemented.

ITS projects mentioned in the last report, which have been fully or partially implemented:

- Automated traffic counting and classification system
- Speed camera system (automated traffic surveillance and infraction management)
- Road weather info system (used for road maintenance and informing the public)
- Road cameras info system (used for road maintenance and informing the public)
- E-police
- Publishing road info on the Internet
- Surveillance systems of 112 vehicles
- Public transport information system (national, regional and local)
- Adaptive signs on roads
- Surveillance systems on borders
- Systems for informing about open spaces in parking lots
- Mobile payment for parking and public transport
- Application for locating closest parking lot
- Vehicle tracking systems
- Travel planners

ITS projects that currently are being developed, renewed or implemented on wider scale.

1. Electronic border system for vehicles

Estonian electronic system GoSwift for border crossings between Estonia and Russia was introduced on 1 August 2011. Two years later GoSwift was ranked among world's 40 best e-services by World Summit Awards and for today has expanded to Lithuanian-Russian and Finnish-Russian border crossing points.

Crossing the Estonian-Russian border was once a time-consuming process resulting in pollution, traffic safety issues, and losses for freight carriers and goods owners. The new system enables drivers to wait for their turn virtually instead of lining up in a physical queue at border checkpoints. Online registering for border crossing, has several positive impacts: reduction of waiting time, cleaner surroundings near border crossing points and considerably more movement of cars and trucks due to online efficiency. Using the system, trucks and cars can now drive to the border just before the registered border crossing time. Drivers can wait at designated waiting areas where toilets, showers, dining areas, and free WIFI are available, proceeding as scheduled to cross the border easily and on time. As a Private Public Partnership project, the system saves Estonian transport companies approximately 4 million euros per year.

2. Single Window¹ concept development

The development and implementation of Single Window system is outlined in the national Transport Development Plan 2014-2020, the Maritime Policy 2012-2020 and the strategic documents of Estonian Tax and Customs Board. The relevant working committee meets regularly since 2012 and includes the representatives of logistics sector: the Association of Estonian International Road Carriers, Estonian Logistics and Freight Forwarding Association, Estonian Logistics Cluster, Estonian IT Cluster and others. The partners are now discussing over the large-scale feasibility study performance and two specific projects are being implemented:

2.1. MobiCarnet project

The objective of the project is to improve the transport flows of goods and reduce the time-consumption of the movement of goods in three strategic transport corridors between Estonia and Finland (Ikla-Kotka, Ikla-Kemi and Luhamaa-Turku). To improve the efficiency of the transport corridors, an innovative information system MobiCarnet will be developed. MobiCarnet is a united and integrated system for automated and paperless management of transit documents and for tracking the movement of goods in real-time. MobiCarnet helps to harmonize transport procedures, as it enables document management electronically in one integrated system, prevents duplication and double checking of data and enables real-time overview of trucks and goods movement for all authorised organisations involved. MobiCarnet enables to reduce transportation time of goods in three transport corridors by more than 13%. The leading partners are the Association of Estonian International Road Carriers and Finnish Transport and Logistics SKAL. The project is supported by the Central Baltic 2014-2020 Programme funds. MobiCarnet software description has been developed in collaboration with the University of Tallinn and supported by the Estonian-Norwegian Programme.

2.2. COMPLEX system development

COMPLEX is a freely available web-based customs declarations' processing system, developed by Estonian Tax and Customs Board. The system was taken into use in 2006 and since then has been regularly improved. The current development would enable the users to interact with Tax and Customs Board through the state data exchange layer X-Road. At the moment the data exchange is possible only by using the web-based environment, but then the project is completed the communication with

¹ The *Single Window* system is a trade facilitation idea. The implementation of a single window system enables international (cross-border) traders to submit regulatory documents at a single location and/or single entity. Such documents are typically customs declarations, applications for import/export permits, and other supporting documents such as certificates of origin and trading invoices. The main value proposition for having a single window for a country or economy is to increase the efficiency through time and cost savings for traders in their dealings with government authorities for obtaining the relevant clearance and permit(s) for moving cargoes across national or economic borders.

the IT systems of exporters/importers will become possible. Furthermore, COMPLEX upgrade is a precondition for the successful launch of MobiCarnet. The solution comprises up to 80% of customs declarations handled Tax and Customs Board, thus having a significant impact on customs authorities and their clients. COMPLEX development results in clients' administrative burden reduction while submitting the customs declarations, reduced cost and time spent on the completing. The payback period of one-time investment necessary for customers' IT system adjustment to common format is about 2 years.

3. Ensuring the quality of information about roads and traffic

Quality monitoring methodology and procedures related to the traffic data are being renewed and the owners of data and monitoring activities are assigned.

4. Better disclosure of information concerning road and traffic

Continuing development of traffic portal called "Tark tee" ("Smart road" <https://tarktee.mnt.ee/?lang=en>). The goal is to exchange information about road conditions and traffic restrictions more efficiently and to create tools for better information management. Also to develop a module where all restrictions on roads, heavy transport warnings and so on can be entered and administered. It should equip everyone with enough information to make efficient route choices.

Sharing information concerning special- and heavy transport. Development of the licence request system and bounding it with maintenance-, traffic supervisor- and information systems.

5. Development of national registry of roads.

The goal is to make public road registry data not just available but easily accessible via IT solutions. Among other things the project creates possibilities to offer new third party services and to decrease the quantity of management decisions.

6. Upgraded functionalities on road information centre

It upgrades quality of road information service and the technical base. To take traffic signs with variable information into service and service them, road information centre must have adeptness of traffic coordination and necessary tools.

7. Ensuring cross - use of ticket system and different data carriers

The goal is to develop a standard for ticketing data carriers and standardize clearing between operators while ticketing will be carried out by private sector.

8. Development of technical systems for providing on-demand bus services

On low settlement density areas public transport should be offered only when needed. In the moment demand-based public transport can be ordered only by phone but an application that will simplify the service is in development.

9. Control systems for public transportation quality.

There are positioning devices on public transport vehicles to conduct survey of service quality.

10. Development of passenger information and notification systems

- 10.1. Screens giving real time information are placed on public transportation stops and stations. This is not a one-time project but rather on ongoing process.
- 10.2. Development of a travel planner, which combines different public transportation modes. Although Estonia has a nation-wide travel planner (http://peat.us.ee/#route_search/eng) as one module of the Public Transport Information System, it needs an upgrade to the latest standards.

11. Automated traffic surveillance

- 11.1. Continued installation of automated and stationary speed cameras to locations where automated speed control is more cost-effective than reconstructing road infrastructure from 2016.
- 11.2. Implementation of speed control which measures average speed on certain road section. Estonian Road Administration has located suitable road sections for this type of speed monitoring system in 2013 and will start to install such devices from 2018, after necessary amendments are approved in the legislation.
- 11.3. Installation of mobile speed cameras in locations where installation of stationary speed cameras is expensive or impossible from 2016. Mobile speed-control system allows quick monitoring problematic or hazardous locations.
- 11.4. Implementation of combined traffic monitoring system with speed cameras (speed control, red light violations, unauthorized use of public transport lanes) from 2016 in Tallinn. Further developments are researched (whether the car has valid insurance or technical inspection, whether the driver kept minimum distance from other vehicles etc.).
- 11.5. Implementation of the weight surveillance system for trucks from 2017 in 3 locations in Estonia. The Estonian Road Administration has to develop an innovative ICT-system for truck overweight monitoring, as violators avoid stationary weighing points.

12. Dynamic traffic regulation

- 12.1. Road sections with adjustable speed limits from 2017, together with adaptable speed intersections (when other vehicles are approaching from side roads) and pedestrian crossing.

- 12.2. Piloting various ITS solutions beginning from 2016 to improve traffic safety and traffic flow (like automated control of vehicle dimensions on infrastructure reconstruction sites to inform drivers).
- 12.3. Developing preliminary project for dynamic traffic management system on Tallinn ringroad by 2017.
- 12.4. Building of dynamic traffic management system on Tallinn ringroad from 2018, which allows to identify possible obstacles and accidents on the ring road and to inform other drivers about hazardous areas.
- 12.5. Implementing energy efficient and traffic-adjustable light-system on roads

13. Traffic accidents management system

- 13.1. Continued development of the information system for Estonian Road information centre (improving the user interface, management of users and the map user interface) on 2016 and 2017.
- 13.2. Receiving real-time video-feed from roundabouts and intersections with intensive traffic around larger cities in Estonia. This allows the Road Administration and rescue services to react to traffic accidents and for the road maintenance services to select appropriate care activities.
- 13.3. Implementing temporary traffic cameras on larger road construction sites. Cameras can give information about traffic flow on the site and creates monitoring possibilities for the customers.

14. Measures to secure uninterrupted traffic flow

- 14.1. Remotely controlled on-street lights on road construction sites, which allow to change the lights programme according to traffic intensity and to create smoother traffic flow.
- 14.2. Real-time weather information and road condition signs for drivers. Estonian Road Administration has 64 road weather stations, which provide real-time information about weather and road conditions. The weather stations on main roads will have with electronic road signs for drivers.

15. Parking information for trucks

- 15.1. Estonian road information web-portal (<https://tartktee.mnt.ee/?lang=en>) will have information about new and more convenient truck parking areas on Estonian roads.
- 15.2. Free wireless internet networks in selected truck parking areas. The network login will include essential road information for the drivers and allows surveys of the drivers about the traffic or travel conditions.

16. Development of road maintenance assistance

- 16.1. Estonian Road Administration provides real time road weather station data to all drivers. The development of the free real-time weather information system will continue in 2016 and 2017. Also in collaboration with the National Weather Service

specific weather information is provided for the 15 road maintenance providers to use appropriate methods and machinery in winter.

- 16.2. “The winter maintenance assistance system” for road maintenance providers to provide accurate weather forecasts and to create early alarm systems in case of severe weather conditions.
- 16.3. Updating the road weather stations, which are outdated and do not provide required data for modern road service and maintenance.
- 16.4. Wider implementation of automatic measuring of the grip coefficient on main roads from 2016. The grip coefficient provides important information to the drivers about the road conditions in winter.
- 16.5. Developing GPS-based monitoring system for road maintenance vehicles.
- 16.6. Developing technical standards for ITS infrastructure and implementation. This allows synchronization of road development projects with possible ITS and communication equipment devices.

17. Public transport information systems in Estonia (national, regional and local)

Since 2009 Estonian Road Administration (RA) is responsible for management and supervision of the state-subsidized bus transport. By 2013 the RA developed the common Public Transport Information System (ÜTRIS) to collect data for better planning, management and supervision. The database includes schedules and line descriptions of active public transport lines, information about public transport operators and detailed contracts of all subsidized public lines. The ÜTRIS database is multifunctional allowing access to third party information sharing and for public transport operators to have an overview of ticket sales and about the mileage of subsidized transport.

The ÜTRIS includes real time data of governmentally subsidized public transport which allows municipalities to offer public transport travel and arrival information on screens in main stops or via smart phones. It also allows subsidizers to monitor the quality and schedules of public transport.

The system includes a web-based travel planner (http://peatus.ee/#route_search/eng), which allows passengers to compile their itineraries according to their needs. And as a future development, passengers will be able to buy public transport tickets via internet. Additionally the electronic ticket sales system will become a useful planning tool for transport operators to provide better services to their customers.

The ÜTRIS database was financed by the EEA and Norwegian financial mechanism.

18. Mobile payment for parking and public transport

Mobile parking has been actively used in all Estonian cities for 15 years, since year 2000. Now Estonia is moving to public transport mobile payment systems, which have been recently developed.

Jiffi is world's first hands-free ticketing system for passengers (jiffiapp.com). Smartphone based solution allows customers to use their smartphone as a ticket and downloading app takes only one click. There will no longer be need to validate tickets manually and boarding time will be up to four times shorter. Ticket queues will also be forgotten as passengers only need their smartphone to have a valid ticket.

Jiffi supports all types of public transportation - buses, trains, trams and metros and it

can be used as a complementary validation mean with already implemented ticketing platforms. Integration with existing passenger revenue management systems is supported but is not necessary for implementation. Fast and reliable digital validation prevents fare evasion that occurs with visual validation means. Automatic inspection mode also forbids last minute validation.

Jiffi has developed end-to-end system for cities and public transportation operators that covers mobile apps for passengers, data management and reporting system with visualized 3D information about trips. Jiffi can be modified to work as Check-In/Be-Out solution in closed ticketing systems. In cases, where passengers enter from the driver's door, they only need to place the smartphone next to Jiffi's beacon for Check-in. Check-out data is collected automatically after exiting the vehicle. Jiffi provides highly valuable check-out data that is crucial for better route planning, multimodal transfer management and flexible pricing based on customers' actual needs.

19. Application for locating closest parking lot – Barking.ee

Barking is an innovative Sharing-Economy type of car parking service that enables property owners to rent out their parking spots on closed areas. They can rent out their spots while they are not using them. Barking grants access to thousands of exclusive and affordable new parking spots in the city centres. The users can book a parking spot in advance and effectively plan their schedule. The parking spot can be booked from home or on the move via mobile phone. On closed areas the users can easily open the barrier or gates via parking mobile phone application. After entering the user phone number, all fees are added to their phone bill. The other option is to use the pay-as-you-go system with credit cards.

20. Travel planners

There are two main travel planning information systems in Estonia. As mentioned, national travel planner www.peatus.ee is based on public data of the Road Administration's Public Transport Information System (ÜTRIS). The system includes the schedules of all subsidized regional bus lines, national plane, train and ship schedules, bus schedules of larger municipalities and international bus lines.

The second main travel planner is for capital Tallinn and for surrounding Harju country on following web address: soiduplaan.tallinn.ee. The route information of this planner is also available on the national travel planner. Tallinn's travel planner has integrated Google Maps and GPS-based information of Tallinn's buses, trolleybuses and trams, which allows passengers to see how far the vehicle they are waiting for is.

21. Bicycle parking with smart bike racks – Bikeep

The Bikeep allows users to lock their bicycles to mobile-phone controlled bike racks in several destinations of Estonian cities. The bike parking system does not require a separate bike lock and is connected to security service. Additionally the Bikeep smart bike rack allows operating bicycle sharing systems or charging electric bicycles via the rack.

22. Calling a taxi via mobile service – Taxify

Taxify mobile application is free to download for all smartphone users and it works on Android and iOS phones. Users can choose a taxi based on arrival time, price list, and car model and user feedback ratings. After confirming the order, user can see taxi arriving on map in real time.

Taxify was established in 2013 in Estonia and is currently operating in Latvia, Lithuania, Estonia, The Netherlands, Georgia and Finland, with plans to open several new countries in Europe.

A description of the national priority areas for actions and related measures,

The most important goal for European transport policy is to create a system that helps promote the economy, increase its competitiveness, to ensure high – quality mobility services while using resources more efficiently. The new ITS action plan, which is currently under development is based on many subject related documents including:

- Estonian Road Administration strategy 2016 – 2019;
- Estonian Road Administrations road safety strategy 2016 – 2025;
- National Transport Development Plan 2014 – 2020;
- EU guidelines on the implementation of ITS (COM(2008)886).

ITS action plan 2016 - 2020 is aimed at satisfying the interests of road users in Estonia and provides the following main objectives:

- Ensuring the smooth flow of traffic on state highways;
- Improving the situation of road safety;
- Development of road maintenance and road user assistance systems;
- Encouraging the use of public transport;
- Gathering different information concerning movement and allowing its free use.

The implementation of current and planned actions covering:

- **Instruments.** Estonian government finances the ITS activities from various sources. Mainly the ITS developments are funded from the Estonian Road Administration yearly budget. In some cases or in larger infrastructure projects the EU-funds are used to finance multi-stakeholder ITS projects. Additionally the Estonian Tax and Customs Board finances cross-border ITS projects together with neighbouring countries and private investors. Several private transportation companies are developing seamless mobile ticketing systems or parking applications in cities.
- **Resources.** The ITS-related activities are mainly funded from the budgets of Estonian Road Administration and the Ministry of Economic Affairs and Communications together with EU structural funds.
- **Consultation and active stakeholders.** During the compilation of Estonian Transport Development Plan for 2014-2020 and the ITS Strategy of Estonian Road Administration major transport and telecommunications sector stakeholders were consulted in the drafting process in 2012-2013. The stakeholders list included private transport sector companies, the representatives of main trade, employers and

employees unions, universities, research institutes, municipalities, government offices and non-governmental organisations.

- **Milestones.** The Estonian Transport Development plan for 2014-2020 (TAK) has established several milestones for the implementation of ITS solutions. For example developing the common public transport ticketing system standard in Estonia is set for 2016; reviewing Estonian legislation for implementing autonomous cars and supporting infrastructure is set for 2016; amendments in Estonian traffic legislation to include ITS-directive regulation were finalized in spring 2015. The Estonian Transport Development Plan for 2014-2020 has an action plan for 2014-2017. In 2017 the Ministry of Economic Affairs and Communications will review the action plan and will set new milestones for all activities and developments.
- **Monitoring.** The Estonian Road Administration (ERA) reviews the implementation of ITS development every year in its working plan review process. Additionally the ERA activities are regularly (every 6 months) monitored by the Estonian Ministry of Economic Affairs and Communications.

Contacts

Estonian Road Administration has been appointed as the responsible institution for the development of ITS in road sector

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With best regards,



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