

Integration of the freight process of Estonian internal and transit road transport in relation to the compatibility options of other modes of transport

Summary

Road transport is an integral part of the Estonian transport sector. Throughout Europe, carriage of goods by road forms the largest percentage of cargo transport. In Estonia, the main challenge in planning transport and mobility is organizing more efficient carriage of people and goods in a way that would also be more convenient for users. Incidentally, Estonia's transport is one of the most polluting ones within the European Union, which is why potential solutions must be found for reducing greenhouse gas emissions. One of the possible solutions is decreasing the proportion of road transport, which has not yet been achieved. Reduction of greenhouse gases is part of the Estonian transport policy, achievable through the intensification and optimization of carriage of goods while integrating multiple modes of transport, in order to find opportunities to reduce fuel consumption and apply the principles of green logistics. As follows from the aforementioned issues, the objective of the doctoral thesis is to find opportunities to integrate the freight processes of road transport along with integrating rail, sea, and air transport into the transport system.

Research field:	Mechanical Engineering
Supervisors:	Dago Antov Jelizaveta Janno
Availability:	This position is available.
Offered by:	School of Engineering Department of Mechanical and Industrial Engineering
Application deadline:	Applications are accepted between September 01, 2020 00:00 and October 02, 2020 23:59 (Europe/Zurich)

Description

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1. How does the integration of smart solutions into the freight process enable the reduction of waste and optimization of the best modes of mobility? Thus, how is it possible to optimize the participation of heavy-duty vehicles in the transport system traffic by implementing intelligent solutions?
2. What is the impact of transit on the Estonian transport sector, and how is it possible to achieve as few external expenses as possible by applying the national transport policy?
3. What is the impact of heavy-duty vehicle traffic on the Estonian seaports and how would it be possible to organize traffic in the port towns in a way that would have the least possible impact on city traffic?
4. What are the prerequisites for the compatibility of different modes of transport and achieving savings in the transport process as a whole? How and to what extent does the integration of modes of transport cause the need for digitalization, and how is it possible to reduce information pollution and time expense created during the freight process, as well as to optimize the use of cargo space? What is the need for digitizing the transport process across different modes of transport?
5. What kind of last-mile transport between compatible transport systems and different types of transport is the most efficient from the perspective of freight operators, end consumers, and the environment?
6. What would be the potential changes in output figures (incl. economic indicators), if integration between types of transport would take place as efficiently as possible; what could be the state's options for increasing tax income from the transport sector compared to the national contribution to the development of the transport sector.

As an output of the doctoral thesis, sample scenarios will be produced for monitoring the implementation of the Estonian transport policy and transport development plan. These scenarios are evaluated primarily from the perspec-

tives of mobility; optimization of the capacity and use of cargo spaces; seaports; smart solutions; and the last mile. In addition to sea transport, rail and air transport developments have been included in the evaluation of scenarios, where possible, especially from the perspective of developments concerning Rail Baltic. The main focus of the created system is on motor transport and its compatibility with other modes of transport.

Responsibilities and tasks

Doctoral research aims to study possibilities of integration of the motor freight transport concerning the compatibility options of other modes of transportation in Estonia mostly. Sample scenarios, as a result, will be produced for monitoring the implementation of the Estonian transport policy and transport development plan shortly. Following aspects as mobility; optimization of the capacity and use of cargo spaces; seaports; smart solutions; and the last mile are considered. Sea transport, rail and air transport developments have been included in the evaluation of scenarios, where possible, as well as developments concerning Rail Baltic.

Qualifications

The call is open for candidates with a wide range of backgrounds in logistics and transportation, both with practical and project related (research) competences. High level of motivation towards developing transportation systems on a regional level with the tight focus on carrying out the results in practice as well as a deep understanding of optimization methods used in transportation is required.



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