

**SITUATION ON INTERMODAL TERMINALS IN THE SLOVAK REPUBLIC**

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**Abstract:** The aim of the article is to describe the current situation and the possibilities of development of intermodal transport in the Slovak Republic (SR) with the potential to link the Slovak Republic better to the inter-modal transport corridors in the countries of the European Community. The construction and operation of a publicly accessible network of intermodal terminals and the installation of non-discriminatory service providers are the main parts of the national development strategy, particularly in continental transport SR. The aim of this transport is to replace road freight transport with using environmentally acceptable rail and water transport together with flexible road transport. To meet this objective, it is necessary to build a comprehensive and progressive network of public intermodal transport terminals in the places where the different types of transport systems come together.

## 1 Introduction

The Central and Eastern European region has grown dynamically over the past decade, starting its development even before the accession of many of the leading economies to the European Union.

Infrastructure shapes mobility. No major change in transport will be possible without the support of an adequate network and more intelligence in using it.

The geographical position predestines Slovakia to pass through commodity flows between eastern and western Europe and in direction north - south, northwest - southeast and southwest - east [1].

In order for the Slovak Republic to know and to engage as much as possible in international transport, the essential prerequisite for the efficient operation of combined transport is the precondition.

Intermodal transport, which includes combined transport, represents an environmentally friendly and energy-efficient freight transport system in freight transport logistics chains. In the transportation of goods, it effectively exploits the advantages of particular modes of transport, especially in the Slovak Republic, especially railways, inland waterways and road freight.

In particular, the geographical location of the SR should be used as an advantage for present and future logistics services. Stimulating demand from the world's leading manufacturers of goods for the use of logistics services and the subsequent creation of a range of quality services, the SR offers a chance for an advantageous operation and networks of logistics centers in Europe, including intermodal terminals. The fact that the Slovak Republic is at the crossroads of two different common and wide gauge gauges gives huge potential for the transport of goods from Russia, Japan, Korea and China to the EU countries and is a prerequisite for their reprocessing in the SR. Another strategic advantage of Slovakia is that the three main transport corridors of the

pan-European transport network and the track are combined (AGTC) pass through Slovakia and create the possibilities of linking and separating the intersections of these routes.

## 2 Status of intermodal transport in Slovakia

The Slovak Republic is not currently using a public intermodal transport terminals (hereinafter TIT) in the true sense. All six active TIT are currently operated by private companies, usually operators of the intermodal transport. The construction and operation of the public accessible and non-discriminatory network services provided through the intermodal terminals is one of the main elements supporting the development of the combined transport, but mostly continental transport in the Slovak Republic. The purpose of this combined transport is to replace the road freight as much as possible, using environmentally acceptable railroad and waterways transportation, along with the flexibility of the road transport. To achieve this goal it is necessary to develop a fully-fledged and progressive public terminal for intermodal transportation in places where the different types of transport systems are interfered.

### 2.1 The framework conditions for the terminal of intermodal transport

The framework conditions for the ideal terminal of intermodal transport can be described as follows:

- length of the railroad for loading and unloading 750 meters,
- the length of the marina is at least 110 meters,
- depth of docking area for a 2.80 meter dive, desirable for a dive of 3.50 meters,
- handling equipment capable of handling any standardized and loaded intermodal cost unit (ISO

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containers, swap bodies, manipulative semi-trailers),

- 100% backup of handling equipment,
- load capacity of handling equipment so that it can handle any intermodal load unit. The manufacturer's recommendations are 40 to 42 tonnes on the hanging device (spreader and claw),
- the capacity of the terminal set up to allow a combined train (600-750 meters) or inland waterway vessel to be processed within 1 hour, and road freight delivery vehicles not expected more than 20 minutes [2].

All these requirements, except for the loading and duplication of handling equipment, stem from international agreements and European law, best described in the AGTC.

The requirement for duplication of handling equipment results from the practice of manipulation. Part of the combined transport offer includes terminal parameters, which are also carefully studied by the bidder. Few shippers or combined transport operators are in danger of "blocking" the shipment due to a technical failure of the transporter. Consequently, intermodal terminals without back-up handling equipment are not accepted in practice because of the possibility of "blocking the carriage" in case of failure.

The requirement for the load-carrying capacity of the handling equipment follows from UIC 599 OR Technical Specification "Suitable Loading and Unloading Equipment for Combined Transport Containers or Wagons" and manufacturer's recommendations. Ultimately, however, the recommended load is based on the total maximum weight of the intermodal load unit, which can be loaded onto the road vehicle, and the so pure intermodal, a combination of water and rail, without a path [2].

**2.2 Technical features of the Slovakian terminals**

**Intermodal terminal Dobra (CTT Dobra) (Figure 1)**

Operator: Trans Container – Slovakia, a. s.  
 CTT Type: Rail traffic – road transport  
 Rail traffic – rail traffic (change of gauge, 1 435 mm/1 540 mm)  
 Area: 180 750 m<sup>2</sup>  
 Storage area: open: 2 640 m<sup>2</sup>  
                   covered: 245 m<sup>2</sup>

Technical equipment: Rail mounted gantry crane (50 t) - 2 pieces

Container handler LUNA RLS - 45 – CT

Number and length of rails: 8 pieces (170 m, 802 m)

**Intermodal terminal Bratislava (CTT Bratislava) (Figure 1)**

Operator: SPaP, a. s. Bratislava  
 CTT Type: Rail traffic – road transport  
 Inland navigation  
 Area: 21 000 m<sup>2</sup>  
 Storage area: 11 000 m<sup>2</sup>  
 Technical equipment: Gantry crane (2 pieces – 16t, 2 pieces – 20t, 1 piece – 36/32t)  
 Front compiler LUNA 45t – 2 pieces  
 Stable ramp RoRo – 1 piece  
 Number and length of rails: 2 pieces (150 m, 300 m)

**Intermodal terminal Kosice (CTT Kosice) (Figure 1)**

Operator: SKD INTRANS, a.s.  
 CTT Type: Rail traffic – road transport  
 Area: 14 820 m<sup>2</sup>  
 Storage area: 2 600 m<sup>2</sup>  
 Technical equipment: 2 pieces - Tire crane (19t, 12t)  
 2 pieces - Side loader 35t  
 Number and length of rails: 2 pieces (2 x 180 m)



Figure 1 Map of intermodal terminals in the Slovak Republic

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Currently there are two intermodal transport terminals in use (CTT), one in Dobra and another in Dunajska Streda. Other, pure container terminals are situated in Kosice, Zilina, Bratislava UNS, Bratislava - port (Palenisko) and in Sladkovicovo.

The Container terminals in Bratislava UNS, Bratislava-port (Palenisko), Zilina and Kosice were built during the 70ties to the 80ties in the last century as container transshipment centers for needs of economic group of the socialist countries.

They were primarily designed and facilities for handling 20-foot (6 m) ISO containers 1C. The current trend aims for using larger 40-foot (12 m) ISO 1A containers and other types of cargo units. The private terminal in Dunajska Streda mainly serves as an ending terminal and longterm storage of inland shipping containers.

### 2.3 Terminal capacity problem in Slovak Republic

Between most important terminal problems in Slovak Republic belong:

- lack of handling equipment
- too small area for storage
- insufficient ultimate load of the foundation
- too small area for transshipment
- no free space for future terminal expansion
- insufficient capacity of road connection
- insufficient capacity of railway connection
- too short rail tracks
- insufficient capacity of inland waterway connection (if any)
- opening hours too short
- other (connection to the logistics centrum).

The biggest shortcoming of TIT in the Slovak Republic is the fact that TIT does not comply (with the exception of terminal Dunajska Streda and Dobra) with requirements for intermodal transport terminals related to the technical equipments according to the international AGTC agreement. These requirements include:

- length of at least one railway line to load and unload: 750 m,
- wharf length: min. 110 m depth to dock dive: 2.80 m - 3.5 m,
- handling equipment able to handle any standardized and established Intermodal transport unit,
- load handling equipment so that they can handle any intermodal transport units - 40 to 42 tons of hang equipment (spreader and collets)
- wholly deposit handling equipment,
- capacity of terminal is set so that it could be block train combined transport (600-750 m) or inland waterway vessel processed to one hour and the road trucks for dispatches did not expect more than 20 minutes.

The biggest shortcoming of TIT in the Slovak Republic is the total obsolescence and lack of the sufficient number of handling equipment, insufficient operating time of the manipulation tracks necessary for downtime minimizing of the trains block formation and for loading and unloading of the ITU, underused business opportunities related to the number of strategic companies in the automotive industry, either directly oriented to the production of cars or parts for their production or repair, and what is the main weakness in comparison with the Czech terminals, their linkage with logistics centres.

Increasing of the terminal capacity and complement of the provided services means that everything is offered in one place. Such like services may be forwarding and banking services, but also providing of the accommodation and refreshment for waiting customers, as well as fuelling, sealing and weighing road vehicles etc.

## 3 Terminal development in Slovak Republic

The main limiting factors of the container terminals in Slovakia are:

- lack length of transshipment rail tracks,
- inconvenient handling devices in terms of their number, load, speed of handling and the possibility to manipulate all intermodal units - containers, swap bodies and trailers
- lack of storage areas within reach of handling equipment, requiring an increased number of manipulations with shipping intermodal units.

From the existing terminals (name and location of operator in brackets), container transshipment center Bratislava UNS (SKD INTRANS, Zilina), Bratislava - port Palenisko (SPaP, Bratislava), Kosice (SKD INTRANS, Zilina), Zilina (SKD INTRANS, Zilina) and Sladkovicovo (Lörincz Ltd.) do not comply with the AGTC (European Agreement about Important International Combined Transport Lines and Related Installations).

The terminal in Dobra (ZSSK Cargo, Bratislava) fulfills the requirements partially and the terminal in Dunajska Streda (METRANS/Danubia) meets the requirements to the greatest extent. Necessary publicly accessible infrastructure is not yet built in Slovakia for intermodal transport. There are roads, railways and ports in Slovakia, but at the moment no public terminals are existent with the necessary technical parameters which offer a non-discriminatory approach.

### 3.1 Public intermodal transport terminal Bratislava

The main objective is to build the technical infrastructure for multimodal intermodal transport, which will meet the requirements of the AGC and AGTC (European Agreement on Main International Railway Lines). The terminal is proposed in the area of the port in

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Bratislava poolside Palenisko. Required performance limit of the terminal is being prepared for 105 000 units / year. The trimodal part of the terminal is proposed of not less than 300 m to cover three river vessels Danube Europe II, nearby dock edge of pool Palenisko. The bimodal part is an extension of the trimodal part in length 450 m, so the total usable length of the crane track will be 750 m. The Public intermodal transport terminal Bratislava construction consists of the following basic parts:

- reconstruction of the existing connecting rail to the railway station Bratislava – Central Freight Station - Railway Station Bratislava-Palenisko, while maintaining the existing line,
- reconstruction of the existing rail infrastructure in the port Bratislava, so that it can operate on rail the proposed terminal and other existing port traffic, railway station Bratislava-Palenisko with arrival and departure group of tracks,
- construction of public intermodal transport terminal, operating in mode water - rail - road, which is proposed on the west bank of the pool area in Palenisko in VI. SPaP position.

**3.2 Public intermodal transport terminal Leopoldov**

The public intermodal transport terminal Leopoldov is proposed as the main terminal for SR, the core of international importance HUB type. That is, as a central terminal for redistribution throughout Slovakia, with using loads of other public intermodal transport terminals not only in Slovakia (Bratislava, Zilina, Zvolen, Kosice), but also to create a train load to Hungary, Poland or Austria and the Czech Republic.

The terminal will perform as a bimodal transshipment node: rail - road transport. Its main task will be to redistribute long-distance load transported by trains from ports to local trains and vice versa. The main activity of the terminal is expected in transshipment of intermodal transport nits railway - railway with possible short-term intermediate storage on paved surfaces.

The location of the proposed terminal is in the village of Sulekovo near the railway station Leopoldov. At the terminal, it is planned to work with two rail gantry cranes and a mechanical handling device. The range of the rail cranes has to be provided that they can serve all tracks, paved areas for short-term storage, and roads for loading and unloading road vehicles. Areas for long-term storage shall be operated with mechanical handling device.

The trains used for the intermodal transport terminal before departure and after arrival are processed in their own departure/arrival group of tracks, located in the space between the rail tracks in the direction from Leopoldov to Trnava and terminal intermodal transport terminal 1.

Departure/arrival group of tracks will be part of the railway station Leopoldov.

In the case of building the Terminal 2, the intermodal transport terminal will be built up the departure/arrival

group of tracks for the needed number of tracks for both terminals. In the terminal TIP 1 proposes to be placed five service tracks underneath the cranes in length of 750 m and in direct reach of gantry crane. One of these tracks can be used as a track Ro-La.

In the future, while increasing volumes of intermodal transport can be expected, a second mirror terminal is planned. In the vicinity of the terminal it is envisages construction of logistics centers, which is not part of the project preparation.

**3.3 Public intermodal transport terminal Žilina**

Intermodal transport terminal Zilina is one of the terminals of international importance, which considering the principle of the development of combined transport by the Ministry of Transport, Posts and Telecommunications of the Slovak Republic. The proposed Intermodal transport terminal Zilina is situated between the railway track Zilina - Vrútky and hydro-electric plant of Žilina in the immediate vicinity station Teplicka nad Vahom, which begun to build in the years 1976-1992, but none of its critical parts has building acceptance. The competition is currently underway on the building renovation contractor for station Teplicka nad Vahom.

The planned construction of the terminal will be connected to the capping piece between directional and exit a group of the station, so the designing is based on the state that the station Teplička is a functional station. Terminal will serve to load the ITU from road to rail and vice versa, as well as the storage of the ITU. It is planned to build five tracks, which 4 of them will be operated by two gantry cranes with load capacity 45 t, transshipping goods between vehicles (train / train, train / truck and vice versa), or from means of transport to a storage area and vice versa. One track will be also used for RoLa transport (trucks using front ramp loaded on a special railway wagon platform and continuing the journey on the train). In addition to cranes, it is recommended that the terminal possessed at least one additional reloading mechanism that could be moved to areas outside their reach. As an additional mechanism for the transport of empty containers a mobile device will be used with a capacity of approximately 15 tons.

Terminal will provide ITU handling of Žilina region and the northern part of the region of Trenčín, or will eventually help with lines RoLa in the north - south. Terminal is located at the intersection of the line AGTC C - C E40 and C - E63 and its catchment area with 80 km range allows the terminal to serve the region Zilina, the north districts of Trenčín region, the region Ostrava in the Czech Republic and the southern part of the Katowice Voivodeship in Poland. The terminal will have the ability to be a input terminal for traffic in all directions and in the future to be part of a logistics center for the area of northern Slovakia.

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**3.4 Intermodal transport terminal Košice**

Company Interport Servis, Ltd. offered in the metropolis of eastern Slovakia, Košice, comprehensive logistics and transportation services since 1996. The area in which the company operates was built in 1970 and originally served as a central transship centre of cars with an annual turnover of up to 50,000 pieces. Nowadays the Interport Servis ranks among the modern European type of logistics companies and in its area equipped with state of the warehouse, logistics and IT systems. It operated the national railway transship center and the network of wide tracks with a direct connection to the Ukrainian railways.

The company is a certified by quality system ISO 9001. In the area of Interport Servis there are a center “Haniska and Customs branch office Kosice” which is designed in compliance with anticorruption programs, and to transparently and equitably for freight forwarding company located in leased offices in the administration building of Interport Servis company.

With outer transshipment is possible to load goods of any kind from wide gauge track to normal gauge or vice versa. Ramps makes also possible to combine transportation systems, which set another degree of freedom, road transport - railway or truck - wagon. Two ramps also allow interleaving goods immediately upon landing and after a period of time secondary loading the desired vehicle. Capacities of unloading ramps are 25 wagons, which in terms of max. Tonnage is about 1,250 tons of material. Capacity of wide gauge and normal gauge is identical. To tracks of European dimension we must include a system of train-formation track. The Interport company has five train-formation track directly connected with the station Velka Ida.

**4 Conclusion**

Support for the development of intermodal transport is crucial in order to develop intermodal transport and stabilize the transportation system equal to other modes of transport. The existing intermodal transport operation highlighted some distortions at the domestic transport market, which do not create an equal field for competition. For this reason, it is necessary in addition to the gradual levelling of competition conditions for each type of transport in the market, it is also a support for creating infrastructure of intermodal transport, which, unlike the infrastructure of other types of transport, which is built systematically over many decades, is lagging behind.

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