



## IMPACT OF TRANSIT SERVICES EXPORT ON LATVIAN GDP

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### **Abstract**

The improvement of transport system and the increase of the international transit services export volume improve the competitiveness of national firms in foreign markets, promote production and employment growth, as well as increase state budget revenues. International transit services forms approximately a half of the services export in Latvia. For more accurate and complete assessment of the international transit services export contribution to the national economy, is necessary to develop the methodology for calculating this contribution. The objective of the paper is to identify which theoretical models of transit services assessment can be used to assess the impact of international transit services export on Latvian GDP. This analysis can be useful in the development and planning of transit-related projects, as well as in the transport sector development in general.

International transit is the part of transport and communications sector in Latvia that was 12.5% of Latvian GDP in 2010. Latvian international transit services consists of seaports, railways, road transport, warehousing and customs brokerage, logistics centers, as well as shipping agents, forwarding agents and petroleum and petroleum product pipeline operator services. The turnover of Latvia's seaports is made approximately 90% of transit freight. Approximately 85% of all transported freight carried by railway through Latvia territory is



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transit freight, mainly from Russia and Belarus to the ports of Latvia (East – West transit corridor).

The methods of the research are systematic, logical and comparative analysis of scientific literature, analysis of statistical data and expert method.

## Introduction

The objective of the paper is to identify which theoretical models of transit services assessment can be used to assess the impact of international transit services export on Latvian GDP. Transit is grasped as the transportation of goods and passengers via third country. The methods of the research are systematic, logical and comparative analysis of scientific literature, analysis of statistical data and expert method.

International transit transport forms approximately a half of services export in Latvia. For more accurate and complete assessment of the international transit services export contribution to the national economy, is necessary to develop the methodology for calculating this contribution. This analysis can be useful in the development and planning of transit-related projects, as well as in the transport sector development in general.

This paper analyzes the contribution of the international transit transport to the economic development of the country, as well as Latvian transit services export and theoretical solutions for assessment of the impact of transit services export on GDP.

## Transit and Economic Development

The improvement of transport system and the increase of the international transit services export volume improve the competitiveness of national firms in foreign markets, promote production and employment growth, as well as increase state budget revenues.

K. Gwilliam argues that the objectives of transit policy may be expressed at three different levels [1]. At the first level there are economic objectives of government that might be expressed as the aim of maximizing social welfare. Applied to transport it might appear as minimizing the total generalized cost of urban transport [2], promoting of “social inclusion” [3], minimizing the environmental impact of transport [4], promoting to increase state budget revenues from international transit services export [5] or promoting economic growth [6]. The second level consists of instrumental or tactical objectives at which, for example, might be appeared that maximizing the public transport modal share or minimizing transport fuel consumption might be the best way of pursuing the fundamental environmental objective. Thirdly, the operational goals might be expressed to minimize the cost of transport to the municipality or state budget [7].

In the end of the 20<sup>th</sup> century and in the beginning of 21<sup>st</sup> century T.R. Lakshmanan D.A. Aschauer, P. Mackie, J. Preston, D. Bazaras, D. Banister, Y. Berechman and other researchers have studied economic consequences of transport infrastructure and transport infrastructure investments on economic development. Despite the link between international transit transport and economic development have been not sufficiently studied. Transit transport services export in Latvia provides the use of transport infrastructure capacities and the development of transport



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infrastructure, as well as the revenues from transport services (sea transport, air transport and others transport) constituted 49.2% of the services export in 2010 [8].

Transit policy addresses simultaneously a number of economic objectives. Transit consists of its international and urban form. International transit is much less studied than transit urban form. Moreover, as the J. Preston argues, that there are link between transport and socio-economic activity because “transport is and intermediate good that is a complement to almost every other good” and “transport demand (particularly if measured by distance travelled) will be determined by where economic activity takes place and (in terms of frequency) when it takes place” [9]. These organizational and financial aspects make difficulties to assess accurately the contribution of international transit (and transport in general) to economy.

There are three analytical approaches for the assessment of the nature and magnitude of the contribution that transport infrastructure makes to the economy. [10]. The first is microeconomic approach – transparent and causal – describing (a) the direct time and cost savings from transport improvements, (b) the indirect impacts of these cost and time savings in the form of lower assembly costs in production and gains from logistical reorganization, and (c) the associated costs including external costs. T.R. Lakshmanan highlights that “this approach, typified by Cost-Benefit Analysis (CBA), is deficient in not treating the further “network” or the general equilibrium effects of transport improvements on transport-using sectors in the broader economy” therefore “the current concern in the field to go beyond CBA analysis towards developing methods which capture the broader economic benefits of transport infrastructure investments” [6, p. 1].

In the context of deficiencies of microeconomic approach in last two-three decades macroeconomic modelling stream has appeared. In the macroeconomic models are identified economy-wide cost reductions and output expansions deriving from transport infrastructure [11] [12], arguing that there are externalities to investments in infrastructure which are not captured in microeconomic CBA studies. Over 100 macroeconomic models offer positive and modest contribution of transport infrastructure, but this macroeconomic approach has two weak points. First, the sharp differences and conflicts among these models on the magnitudes and direction of economic impacts of infrastructure, and second, these macroeconomic models offer little clue to the mechanisms linking transport improvements and the broader economy [6] [13] [14].

The third approach that might be distinguished is extensive literature on the broader economic consequences of transport investments on economic processes. In the framework of this approach the Economic Historians argue economic transformation attendant on large past investments in railroads and waterways around the world showing how transport infrastructure improvements open up markets, achieve gains from trade, promote inter-regional integration and enhance the performance of factor markets. One of the key findings in the approach is that the upshot of full effects of transport infrastructure is the growth of total factor productivity (TFP) in the economy.

All three approaches described above can be used to assess the contribution of international transit infrastructure and infrastructure investments to economy. The application of the approaches depends on the objective of the research. The objective of this paper is related to the assessment of the impact of the transit services export on GDP therefore microeconomic approach can not be applied because it focuses on analyzing of the improvements in productivity of individual firms due to transport infrastructure investments. While



macroeconomic modelling and the approach on the broader economic consequences of transport investments on economic processes can be used to assess the impact of the international transit services export on GDP.

## International Transit Transport Services and the Economic Development of Latvia

Two fields of scientific literature on the economic consequences of transport can be distinguished where macroeconomic modelling dominates. First relates to seeking links between investments in transport infrastructure projects and economic development [15] [16] [17], but second analyses the long-term contribution of transport infrastructure to economy [9] [18]. D. Canning and E. Bennathan have made the estimation of the elasticities of output from transport infrastructure with respect to public capital for a panel of countries in different stages of development [17] (see Table 1). There is an inverted U shape, with higher elasticities in middle income countries and lower in the low and the high ends of the income distribution. In 2010 in Latvia the average gross monthly wage of employed was 455 LVL or 633 EUR [8, p. 76] and GDP at constant prices was 3039 LVL or 4324 EUR (at current prices – 5688 LVL or 8093 EUR) [19] therefore Latvia can be classified as country in middle quartile of incomes and transport infrastructure productivity can be comparatively high.

Table 1

### Transport infrastructure productivity in countries at different stages of development

	Countries in lower quartile of incomes	Countries in middle quartile of incomes	Countries in upper quartile of incomes
Output elasticity of paved roads	0.05	0.09	0.04

Source of data: Canning and Bennathan, 2001

The approach of broader economic consequences of transport argues wider economic benefits of transport infrastructure investments. Figure 1 offers contemporary version of what the Economic Historians call “forward linkages” of transport infrastructure [20] [21].

As transport infrastructure and service improvements lower costs and increase accessibility to various market actors – input suppliers, labour and customers – market expansion, increased integration and sustaining growth will ensue. In the short run such changes ripple through the market mechanisms reinforcing employment, output and income. In the long run transport service improvements activate a variety of interconnected economy-wide processes and yield a range of sectoral, spatial and regional effects that augment overall productivity. These underlying mechanisms can be organized into [22]:

- gains from trade,
- technology diffusion,
- coordination device and the “Big Push” and
- gains from agglomerations, which are made possible by transport.

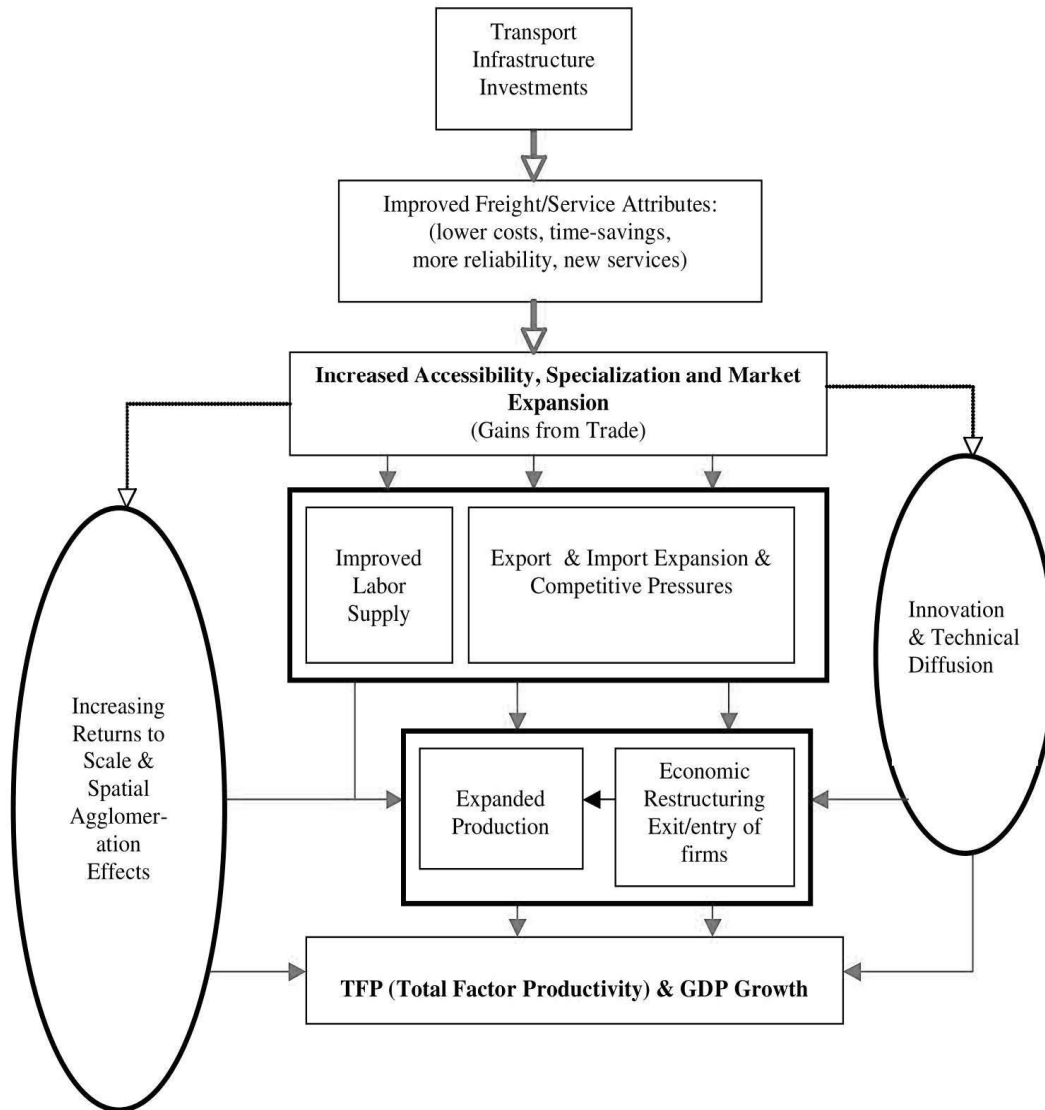


Figure 1. Transport infrastructure and economy-wide benefits (Lakshmanan, 2011, p. 9)

The US Interstate Highway System, the Trans-European Network (TEN) and super-efficient ocean ports all contribute to growth-growth arising from specialization and trade. In Latvia the similar effect for development was made by building of railways in the 19th century, as well as by building of the multimodal sea ports and trunk roads in 20th century. But in the 21st century the broad impulse for economic development can be made by rapid development of the Riga International Airport and building of the new high speed railway “Rail Baltica” that will connect railway transport of Baltic States and Western European countries creating completely new opportunities for passengers and freight transport.



The flows of freights are the main factors of the transport system functioning. Market determines the flows of transport, and their repartition among the corridors of transport – the concrete systems of the transport, technical, organizational and legal conditions of transport linkage [5].

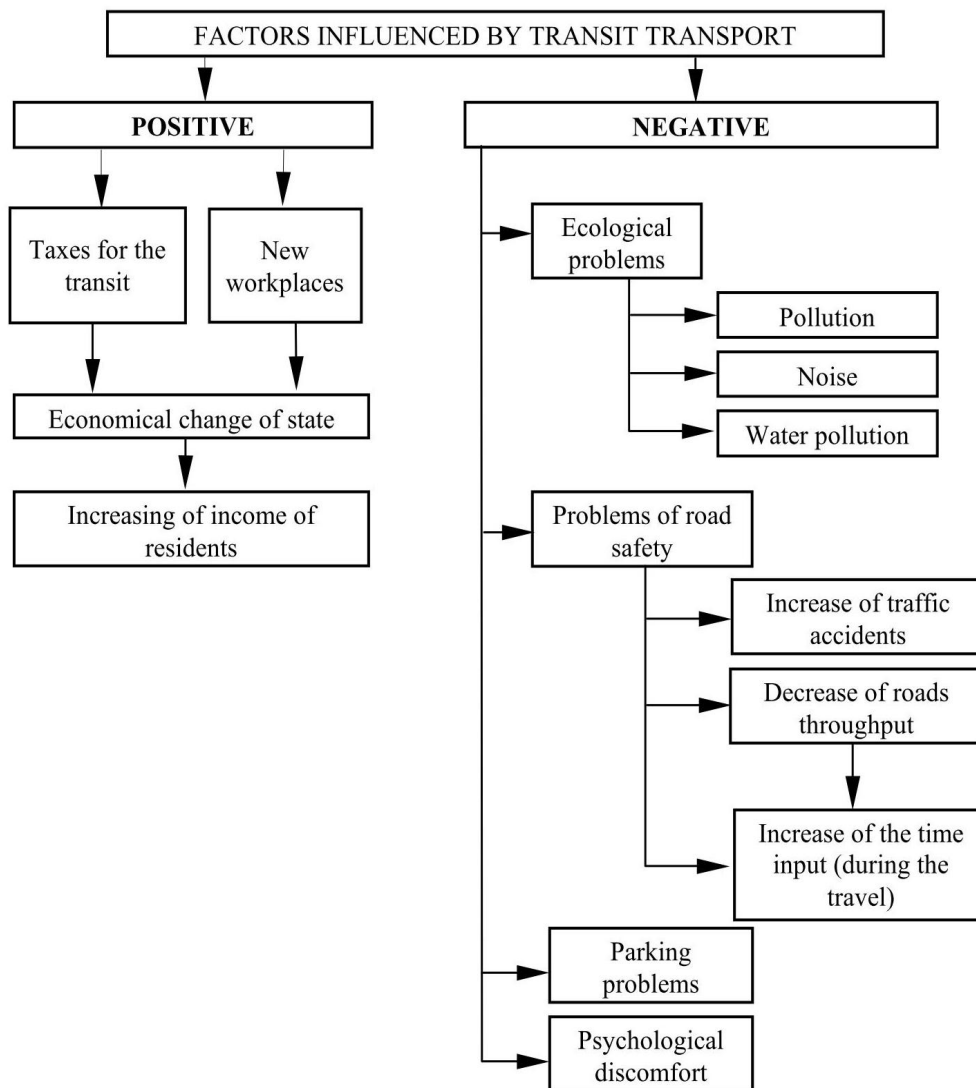


Figure 2. Factors influenced by transit transport (Bazaras and Palšaitis, 2003, p. 251)

D. Bazaras and R. Palšaitis have developed the model that shows which factors are influenced by transit transport (Figure 2) [5]. The transit transport profitable effect for the economy can be evaluated by counting paid-in taxes (for example, entry, transit, ecological, using of infrastructure). The transit states income could consist of the prices of taken services



and the goods, which were bought by transit sector enterprises. Latvian authorities in their official statistics estimate the contribution of different economic sectors by the numbers of indicators: output volumes and number of employed of all economy sectors, dynamics and structure of investment sectors, as well as structure of all economy sectors. International transit is the part of the transport and communications sector in Latvia that was 12.5% of Latvian GDP in 2010 employing 9.9% of total employed in the country [8, p. 25]. The revenues from transit transport services (sea transport, air transport and others transport) constituted 49.2% of the services export in 2010 [8, p. 24].

There is no explicit assessment of what is the contribution of international transit to the national economy and its development in Latvia. The Ministry of Transport has estimated that the international transit services each 10 million tones carried by Latvian territory give at least 1% of the total GDP [23, p.11]. Accordingly the total contribution of cargo transit to the Latvian GDP might be about 6% in 2010. One of the problems in the estimation of international transit contribution to economy is the lack of correct methodology that is not so far sufficiently studied question in the science.

The problematic issue in the assessment of international transit is the calculation of the transit freight that is transported and freighted. R. Burkovskis analysing the inter-state flows of transport, hypothesised that the joint flows of goods and the values of economic variables are related according to the formula [24]:

$$Q_K^{OD} = f(P_K^{OD}, \tilde{P}_K^{OD}, I^D, D_m), \quad (1)$$

where  $Q_K^{OD}$  is the quantity of goods K, which were made in O country and sent to country D;  
 $P_K^{OD}$  is the price after the goods are delivered to country D (the production expenses plus taxes for the transportation);  
 $\tilde{P}_K^{OD}$  is the price of goods K, which were delivered to country D, if K had been bought some where (not in country O);  
 $I^D$  is D countries;  
 $D_m$  ( $m = \dots M$ ) is a range of possible variables, which show the unvalued characteristics of production and consumption in the analysed countries.

The data concerning inter-state transportation can be taken from the statistics of the loads/goods conveyance and the expanses of goods production can be found in the same way, but this information must be taken by their producers.

In Latvia transit transport services export is formed by road haulage, railway transport, sea transport, air transport and pipeline transport. Latvian transit services consists of seaports, railways, road transport, warehousing and customs brokerage, logistics centers, as well as shipping agents, forwarding agents and petroleum and petroleum product pipeline operator services [25]. The turnover of Latvia's seaports is made approximately 90% of transit freight. Around 80% of transit freight transported through Latvia is handled through three export-oriented big ports (Riga, Ventspils and Liepaja) that carried 59.6 million tons cargo in 2010 [26]. These three ports are connected to TEN-T road and rail, as well as two oil and one oil



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products pipelines to Ventspils. Approximately 85% of all transported freight carried by railway through Latvia territory is transit freight, mainly from Russia and Belarus to the ports of Latvia (East – West transit corridor) [27].

The main freight transporter by rail is the State Joint Stock Company “Latvijas Dzelceļš” carrying about 80% of the total volume of transit cargo that is transported by rail in Latvian territory. In 2010 the volume of cargo transported by SJSC “Latvijas Dzelceļš” was 49164 thousand tons (Figure 3).

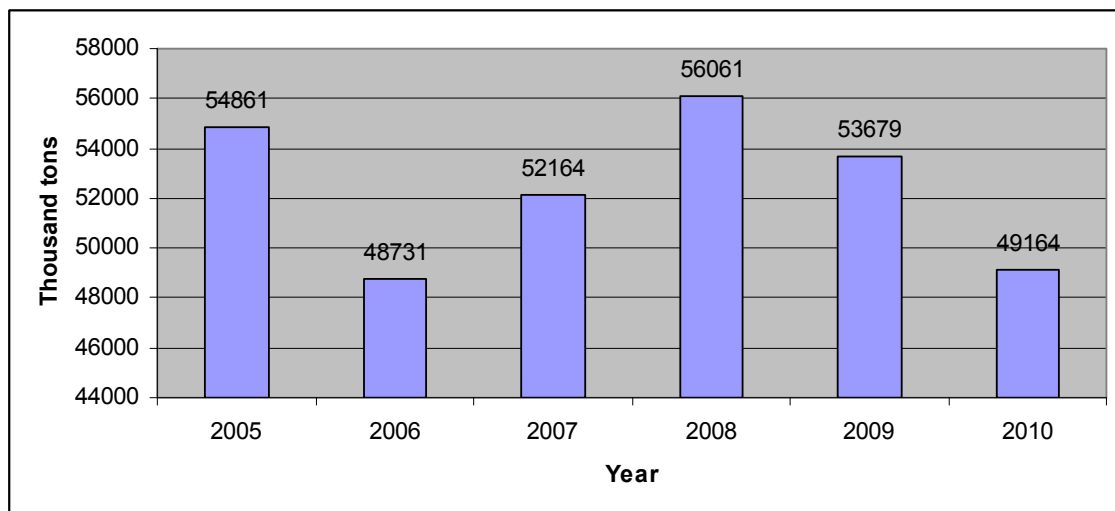


Figure 3. SJSC “Latvijas Dzelceļš” volume of freight transported (thousand tons) 2005-2010

Source of data: “Latvijas Dzelceļš”, 2011

The road haulage is also used in international transit activities in Latvian territory. The most of the international transit transport volumes are related with transporting of Russian and German cargo. The demand for car transport services for approximately 2/3 parts depends on domestic demand, but the third is related to external demand – mostly it is transit services [23, p. 4].

The Latvian transit corridor of oil and oil products is formed by trunk pipelines of oil and oil products together with oil terminals. The trunk pipeline system includes two oil pipelines and one pipeline of oil products in the territory of Latvia. The oil pipeline Polotsk—Ventspils with capacity of 16 million tons per year was put into operation in 1968, additional parallel pipeline of oil products with capacity of 5 million tons started operating in 1971 [29]. In order to ensure the Mazeikiai oil refinery with oil, in 1980 the pipeline Polotsk—Birzai—Mazeikiai was put into operation. Up to Birzai the pipeline runs parallel to the Polotsk—Ventspils pipeline. In 2010 only oil products pipeline to Ventspils (Ventspils port) has used to transport oil products from Polotsk to Ventspils but the oil pipeline Polotsk—Ventspils is not used since 2007. It is related to decision of Russia to divert oil transit through the newly built its own sea port in Primorsk [30]. In last years for similar reasons oil pipeline Polotsk - Birzai - Mazeikiai is not used for oil transportation.





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SJSC Riga International Airport is the only international airport in Latvia. This airport has growing number of transit and transfer passengers – 1.75 million transit and transfer passengers was serviced in 2010 [31]. The Ministry of Transport expects that the number of transit and transfer passengers serviced in the airport could reach 3.74 million people in 2013 [32].

All existing international transport modes and networks in Latvia operate in environment of international competition, and mainly compete with the other Baltic States (Lithuania and Estonia), Finland and Russia.

Both the public and the private sector invest in development and modernization of transport infrastructure. The private sector focuses on the modernization of sea ports and logistics infrastructure. The country's largest investments in transport infrastructure are used primarily for development of transit transport directions, where European Union structural funds and national budget are used. The statistical data analyzed above indicates that the international transit cargo transportation dominates in rail, sea port and pipeline transports that confirm the importance of international transit on exploitation of transport capacity and transport development in general. Currently in Latvia the most actual and extensive transport infrastructure project is “Rail Baltica” railway line where one of the essential aspects in economic justification of the project is providing of necessary transit cargo flow [33].

## Conclusions

The contribution of international transit to GDP is not so far sufficiently studied both in Latvia and abroad. The most appropriate theoretical solutions that can be used for assessment of transit transport contribution to economy are macroeconomic modelling, the approach of broader economic consequences of transport and existing international transit assessment models.

There are two ways to study impact of international transit services on the GDP. First, the contribution of transit investment projects and/or transit infrastructure to economic development can be studied. In this case the extensive literature on links between transport improvements and economy can be used. The second option is to investigate the direct contribution of international transit revenues to GDP assessing relative volume of international transit transport sector in GDP or assessing the taxes paid by international transit transport sector. Currently Latvian authorities assess the contribution of international transit to GDP using imperfect methodology and obtaining approximate results.

The existing transport and international transit patterns can be applied to Latvian case but currently official statistics on international transit of Latvia is not complete and some international transit components are not identified, such as transit cargo by ferries and airplanes, transit passengers serviced at sea ports. That's why this statistics should be improved and then it can be included in the appropriate international transit services assessment models.

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