

Potential Effects of the 1 July 2026 Extension of Driving Time and Rest Period Rules to 2.5 – 3.5 t Vehicles in International Road Freight Transport

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Abstract This article analyses the potential effects of extending, from 1 July 2026, the obligation to use tachographs and to comply with regulations on driving time, breaks and rest periods to vehicles with a maximum permissible mass exceeding 2.5 t but not exceeding 3.5 t in international commercial road transport of goods. The aim of the study was to estimate the impact of these changes on the operation of enterprises in the transport, forwarding and logistics (TSL) sector. A mixed-method approach was applied, including a legal framework analysis, a comparison of transport time for two international routes under different vehicle categories and driver crew configurations (activity sequence diagrams), and an anonymous survey among representatives of transport and forwarding companies. The route analysis indicates that following the introduction of the regulations the time advantage of transport performed by vehicles with a maximum permissible mass ≤ 3.5 t in time-sensitive operations is significantly reduced, while the shortest transport time on the long-distance route is ensured by the double-crew configuration of a heavy goods vehicle. The survey results confirm an expected decrease in the competitiveness of transport operations performed using vehicles with a maximum permissible mass ≤ 3.5 t and indicate planned adaptation measures, in particular shifting part of the orders to vehicles with a maximum permissible mass > 3.5 t.

Keywords road transport, tachograph, driver working time, vehicles ≤ 3.5 t, mobility Package, transport time analysis, survey research

JEL R41, R48, K23

1. Introduction

International road freight transport in the European Union has undergone significant regulatory changes in recent years. One of the key reforms is the extension of the obligation to use tachographs and to comply with driving time, breaks and rest period regulations to vehicles used in international road transport of goods with a maximum permissible gross vehicle weight exceeding 2.5 tonnes but not exceeding 3.5 t, effective from 1 July 2026 [1]. Until the entry into force of these provisions, vehicles with a gross vehicle weight not exceeding 3.5 t have not been subject at the EU level to the regulations governing drivers' driving time and rest periods. In practice, international transport performed by light commercial vehicles (LCVs) has therefore relied on national rules of individual Member States (e.g., German FPersV with the requirement to maintain a *Kontrollbuch*). In many EU countries, such rules are weakly enforced, which often leads to their omission in practice [8]. As a result, the absence of tachograph obligations and limited inspection coverage may contribute to insufficient supervision of driving time, breaks and rest periods, with potential implications for road safety. This issue was already highlighted in Regulation (EC) No

561/2006 and, together with the objective of ensuring fair competition, constitutes an important rationale for the changes effective from 1 July 2026 [3]. Enforcement and cross-border cooperation aspects have also been addressed by the European Labour Authority (ELA) [7]. Previous research on working time regulations has primarily focused on heavy goods vehicles (HGVs), while the segment of LCVs (not exceeding 3.5 t) has remained underexplored in the context of international operations [4], [5]. Available studies indicate that transport companies are not fully prepared for the implementation of the new requirements [2]. The extension of driving time regulations and tachograph obligations to vehicles with a maximum permissible mass of 2.5-3.5 t may alter competitive conditions between LCVs and HGVs and influence transport organisation and operational decisions.

The aim of this article is to present the perspective of enterprises operating in the transport and forwarding sector regarding the planned regulatory extension effective from 1 July 2026, based on a survey conducted among representatives of transport and forwarding companies. In addition, the article compares the theoretical transport time for two international routes in different vehicle categories and single-driver / double-crew configurations, and analyses

enterprises' declarations concerning expected impacts on the number of routes performed, the competitiveness of LCVs and planned adaptation measures.

2. Methodology

2.1. Legal Framework and Scope of Analysis

The assumptions adopted in this study are based on the legal provisions regulating driving time, breaks and rest periods, as well as the obligation to use tachographs in road freight transport within the European Union, with particular emphasis on the extension of these regulations to vehicles with a maximum permissible mass exceeding 2.5 t but not exceeding 3.5 t in international transport from 1 July 2026. The analysis considers the following legal acts: Regulation (EC) No 561/2006 and its amendments [3], Regulation (EU) 2020/1054 [1], Regulation (EU) No 165/2014 [11], the AETR Agreement [12], and Directive 2002/15/EC [6]. The study focuses on driving time limits, mandatory breaks and daily rest periods, while weekly rest periods were excluded from the scope of the modelling due to the operational horizon of the analyzed routes.

2.2. Analysis of International Route Performance

The analysis of transport time was conducted for two economically significant international routes (Warsaw–Bologna and Strykow–Hamburg), selected based on the report of the Polish Road Transport Institute (PITD) [9]. A constant average speed of 90 km/h was assumed for both vehicle categories (≤ 3.5 t and > 3.5 t) in order to isolate the regulatory effect from technical and operational variability. This value corresponds to the midpoint of reported average motorway speeds. The analysis included three organizational variants:

1. vehicle > 3.5 t – single-driver configuration;
2. vehicle > 3.5 t – double-crew configuration;
3. vehicle ≤ 3.5 t – single-driver configuration (reflecting the legal situation before and after 1 July 2026).

The results are presented in the form of activity sequence diagrams illustrating driving periods, breaks and daily rest periods for each scenario.

2.3. Survey Research

The survey was conducted anonymously and addressed to a defined group of respondents from the transport and forwarding sector. Responses were requested from company owners (in the case of small enterprises), department managers, and specialists responsible for transport organisation. The sample selection included individuals possessing practical knowledge and direct influence on operational decisions within transport companies. Participation was voluntary, and respondents were informed about the research character of the questionnaire. The questionnaire included single- and multiple-choice questions as well as questions based on a five-point Likert scale. The

use of various question types enabled the collection of data concerning the company profile and fleet structure, as well as respondents' assessments related to the planned regulatory changes. The survey consisted of nine questions concerning the company's business profile, possession of LCVs (maximum permissible mass not exceeding 3.5 t) and, where applicable, the size of such a fleet, as well as the reasons for discontinuing the use of this vehicle category. The questionnaire also included questions regarding the level of awareness of the planned regulatory changes effective from 1 July 2026, the assessment of their impact on company operations, the expected influence on the number of transport routes performed, the perceived impact of working time restrictions on the competitiveness of LCVs, and planned adaptation measures in response to the new regulations.

3. Results

3.1. Analysis of International Route Performance

The analysis was conducted for two international routes (Warsaw, PL – Bologna, IT and Strykow, PL – Hamburg, DE) with reference to two vehicle categories: vehicles with a maximum permissible mass > 3.5 t and vehicles with a maximum permissible mass ≤ 3.5 t, as well as crew configurations (single-driver and double-crew for vehicles with a maximum permissible mass > 3.5 t). The results are presented in the form of activity sequence diagrams covering driving periods, mandatory breaks and daily rest periods. For vehicles with a maximum permissible mass ≤ 3.5 t, separate sequences were not presented for the legal situation after 1 July 2026, since, under the assumed identical average speed and the application of the same driving time, break and rest restrictions, the schedule is identical to the single-driver configuration for vehicles with a maximum permissible mass > 3.5 t (Figure 1). The double-crew variant for vehicles with a maximum permissible mass ≤ 3.5 t was not analysed for the same reasons.

Warsaw, PL - Bologna, IT route (1413 km)

Figure 1 presents the sequence of driving periods for a vehicle with a maximum permissible mass > 3.5 t in a single-driver configuration. The activities include driving periods, mandatory breaks (2×45 min) and a daily rest period (11 h 00 min). The total transport time amounts to 28 h 12 min, including driving time of 15 h 42 min, breaks of 1 h 30 min, and a daily rest period of 11 h 00 min.



Figure 1. Sequence of driving periods, mandatory breaks and daily rest period – Warsaw, PL – Bologna, IT route, vehicle with a maximum permissible mass > 3.5 t, single-driver configuration. Source: own elaboration.

Figure 2 presents the sequence of activities performed during transport by a vehicle with a maximum permissible mass > 3.5 t in a double-crew configuration. In this variant, alternating driving and availability periods were applied, which made it possible to complete the journey without introducing a stop resulting from the daily rest period within the analysed time horizon. In this configuration, the availability period of one driver occurs in parallel with the driving period of the other; therefore, the schedule does not distinguish an additional 45 min break as a separate activity. The total transport time amounts to 15 h 42 min.

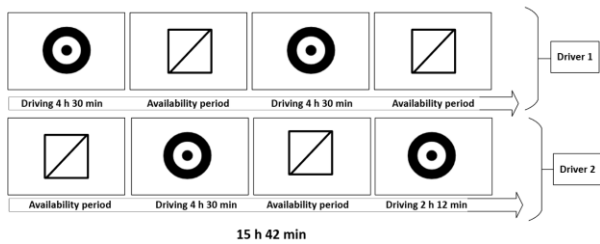


Figure 2. Sequence of driving periods and availability periods – Warsaw, PL – Bologna, IT route, vehicle with a maximum permissible mass > 3.5 t, double-crew configuration (Driver 1 / Driver 2). Source: own elaboration.

Figure 3 presents the sequence of activities for a vehicle with a maximum permissible mass ≤ 3.5 t in a single-driver configuration. The variant includes one mandatory break (45 min) and a daily rest period (8 h 00 min). The total transport time amounts to 24 h 27 min, including driving time of 15 h 42 min, a break of 45 min, and a daily rest period of 8 h 00 min. In the case of vehicles with a maximum permissible mass ≤ 3.5 t, the daily rest period has a conventional character (it does not result from the obligation to apply Regulation 561/2006 under the legal situation prior to 1 July 2026). In the analysis, a daily rest period of 8 h 00 min was adopted as a minimum organisational stop.

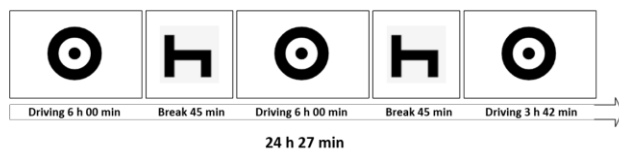


Figure 3. Sequence of driving periods, mandatory break and daily rest period – Warsaw, PL – Bologna, IT route, vehicle with a maximum permissible mass ≤ 3.5 t, single-driver configuration under the current legal framework. Source: own elaboration.

Strykow, PL –Hamburg, DE route (745 km)

Figure 4 presents the sequence of activities for a vehicle with a maximum permissible mass > 3.5 t in a single-driver configuration. The variant includes one mandatory break (45 min). The total transport time amounts to 9 h 02 min, including driving time of 8 h 17 min and a break of 45 min.

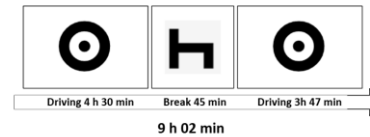


Figure 4. Sequence of driving periods and mandatory break – Strykow, PL – Hamburg, DE route, vehicle with a maximum permissible mass > 3.5 t, single-driver configuration. Source: own elaboration.

Figure 5 presents the sequence of activities during the Strykow, PL – Hamburg, DE route for a vehicle with a maximum permissible mass > 3.5 t in a double-crew configuration. In this variant, the availability period of one driver occurs in parallel with the driving period of the other; therefore, the schedule does not distinguish an additional 45 min break as a separate activity. The total transport time amounts to 8 h 17 min.

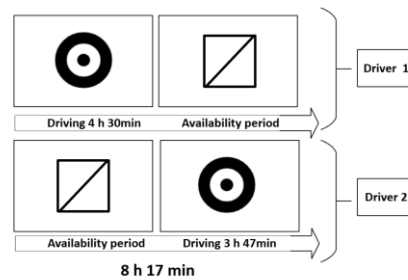


Figure 5. Sequence of driving periods and availability periods – Strykow, PL – Hamburg, DE route, vehicle with a maximum permissible mass > 3.5 t, double-crew configuration (Driver 1 / Driver 2). Source: own elaboration.

Figure 6 presents the sequence of activities performed by a vehicle with a maximum permissible mass ≤ 3.5 t in a single-driver configuration. Under the adopted assumptions, the driving time is identical to the variant for heavy goods vehicles and includes one break (45 min). The total transport time amounts to 9 h 02 min.

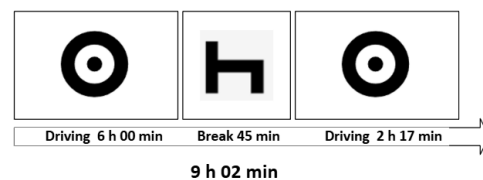


Figure 6. Sequence of driving periods and mandatory break - Strykow, PL – Hamburg, DE route, vehicle with a maximum permissible mass ≤ 3.5 t, single-driver configuration. Source: own elaboration.

The analysis of activity sequences indicates that on long-distance routes the shortest transport time is ensured by the double-crew configuration of vehicles with a maximum permissible mass > 3.5 t, compared to the single-driver configuration. Under the legal situation prior to 1 July 2026, the transport variant using vehicles with a maximum permissible mass ≤ 3.5 t is characterized by a shorter transport time in international operations, resulting from greater organizational flexibility. After the entry into force of the regulations on 1 July 2026, the time advantage of the transport variant using vehicles with a maximum permissible

2.5 – 3.5 t in international operations will be significantly reduced.

3.2. Survey Results

The survey covered 54 enterprises operating in the transport and forwarding sector.

In response to the question regarding the company’s business profile, 92.6% of respondents (n = 50) declared that they conduct international transport operations, while 24.1% (n = 13) indicated domestic transport. The question allowed multiple answers, which means that some enterprises conduct both domestic and international transport simultaneously.

Figure 7 presents the percentage distribution of responses to Question 2 concerning the possession of vehicles with a maximum permissible mass ≤ 3.5 t. The results indicate that the majority of surveyed enterprises declared the use of this vehicle category, while the remaining entities reported either not possessing such vehicles or having discontinued their use in the past.

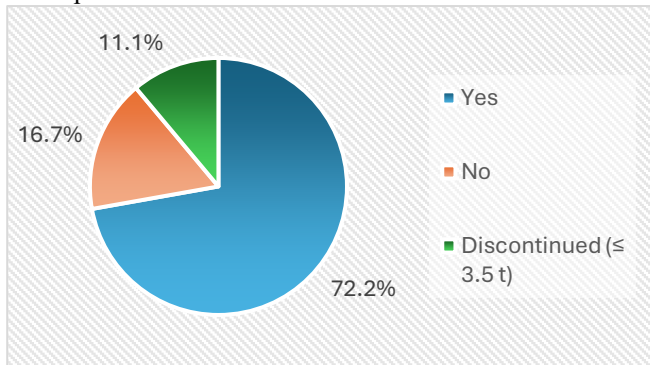


Figure 7. Possession of vehicles with a maximum permissible mass ≤ 3.5 t (n = 54). Source: own elaboration.

The fleet size structure in the surveyed group of enterprises is presented in Figure 8. The smallest fleet category was indicated most frequently, while the remaining responses included medium and large fleets. Responses were provided exclusively by respondents who, in the previous question, declared the possession of this vehicle category.

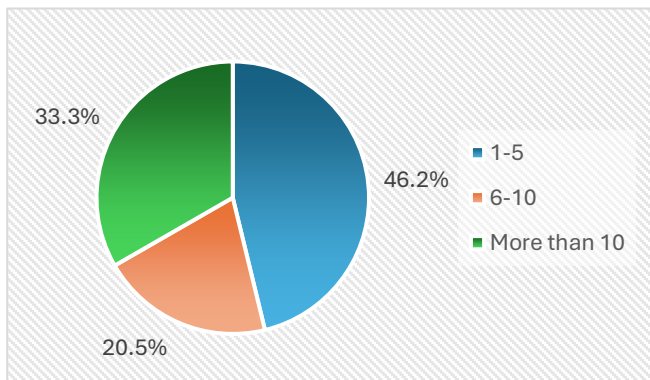
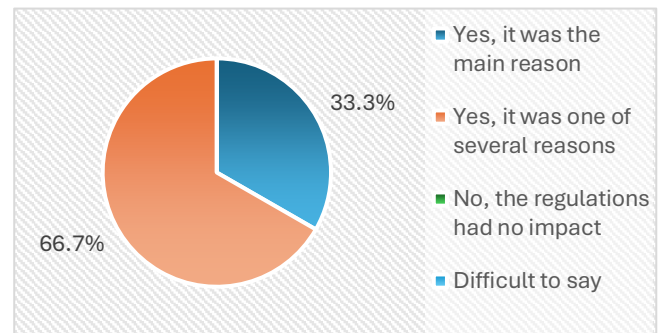


Figure 8. Fleet size of vehicles with a maximum permissible mass ≤ 3.5 t (n = 39). Source: own elaboration.

In the surveyed group of enterprises that discontinued the use of vehicles with a maximum permissible mass ≤ 3.5 t, the planned regulatory changes were indicated as a significant reason for this decision. As illustrated in Figure 9, for some respondents they constituted the main reason for discontinuation, while for others they represented one of several reasons. The responses concerned exclusively



entities that had discontinued the use of this vehicle category.

Figure 9. Impact of regulatory changes on the discontinuation of vehicles with a maximum permissible mass ≤ 3.5 t (n = 6). Source: own elaboration.

The survey results indicate a high level of respondent awareness regarding the planned regulatory changes effective from 1 July 2026 in international road transport. In response to the question concerning awareness of the planned changes, 94.4% of respondents (n = 54) declared familiarity with the introduced regulations. Only 3.7% indicated the answer “partially”, while 1.9% reported no knowledge in this area.

Respondents assessed the impact of the planned regulatory changes on company operations on a five-point scale (1 – very negative impact, 5 – very positive impact) (n = 54). The most frequently indicated rating was 3 (35.2%, n = 19). Ratings 1 and 2 each accounted for 25.9% of responses (n = 14 each), which means that, in total, ratings in the range 1 – 3 represented 87.0% of all responses (n = 47). Positive ratings were less frequent: 4 (7.4%, n = 4) and 5 (5.6%, n = 3). The distribution of responses indicates a predominance of neutral and negative assessments, with a limited share of positive evaluations.

Most respondents anticipate changes in the number of transport routes performed following the entry into force of the new regulations. An expected impact on the number of routes was indicated by 74.1% of respondents (n = 40), while 16.7% (n = 9) stated that an impact is possible but difficult to assess unequivocally at the time of the survey. No expected impact was declared by 9.3% (n = 5). These results indicate that a clear majority of enterprises expect changes in the number of routes performed as a consequence of the new regulations.

Respondents most frequently indicated a deterioration in the competitiveness of transport operations performed using vehicles with a maximum permissible mass ≤ 3.5 t as a result of the introduction of new requirements related to driving time limits, mandatory breaks and daily rest periods. A summary of responses is presented in Figure 11. The most commonly expressed concerns related to the loss of the time

advantage and a decrease in the profitability of this transport segment. These results refer to respondents' declarations regarding the expected impact of the planned regulations on the competitiveness of transport operations performed by vehicles with a maximum permissible mass ≤ 3.5 t.

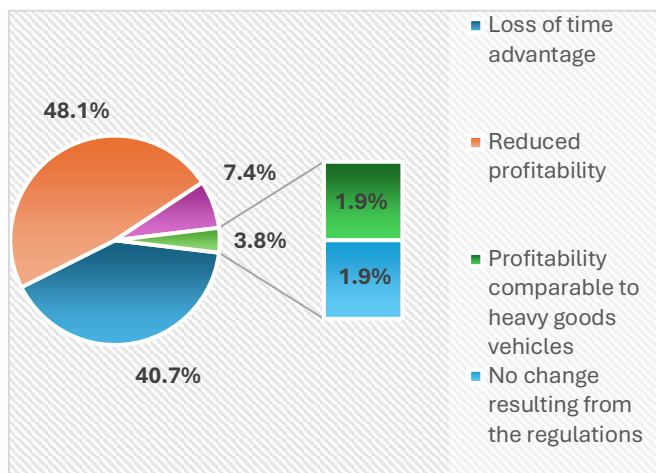


Figure 11. Impact of driving time restrictions on the competitiveness of transport operations performed using vehicles with a maximum permissible mass ≤ 3.5 t (n = 54). Source: own elaboration.

In the context of the planned regulatory changes, enterprises declared diversified directions of operational adaptations. The most frequently indicated measure was shifting orders to vehicles with a maximum permissible mass > 3.5 t (43.1%, n = 22). Another commonly selected response was a change in the service profile (19.6%, n = 10). Some respondents also indicated business closure (15.7%, n = 8) and establishing cooperation with large forwarding companies (13.7%, n = 7). In 9.8% of cases (n = 5), responses were classified as unspecified (no clarification provided). The remaining responses were single indications (2.0%, n = 1 each) and included, among others, no planned actions, not possessing vehicles in this category, waiting for the market response, and the answer "I do not know".

The results obtained from the survey indicate a high level of enterprise awareness regarding the planned regulatory changes. Most respondents anticipate that the new regulations will affect the number of transport routes performed and the competitiveness of transport operations carried out using vehicles with a maximum permissible mass ≤ 3.5 t. The most frequently declared adaptation measure is shifting part of the orders to vehicles with a maximum permissible mass > 3.5 t.

4. Conclusions

In this article, an assessment was conducted of the potential effects of subjecting vehicles used in international commercial road transport of goods to regulations concerning tachographs and driver working time, which will enter into force on 1 July 2026 [1]. The results of the transport time analysis indicate that, once light commercial vehicles are covered by break and rest requirements, the time

advantage of the transport variant performed using vehicles with a maximum permissible mass ≤ 3.5 t in international operations will be significantly reduced. On long-distance routes, the shortest transport time is ensured by the double-crew configuration of vehicles with a maximum permissible mass > 3.5 t; however, this is associated with higher costs and additional staffing requirements. The previous organisational flexibility of transport operations performed using vehicles with a maximum permissible mass ≤ 3.5 t, resulting from less restrictive working time constraints, remains a key factor supporting their use in time-sensitive transport.

A limitation of the calculations performed is the assumption of a constant average travel speed and the omission of the effects of congestion and transshipment operations. The survey results confirm that enterprises anticipate significant changes in transport organisation, including a decrease in the number of transport routes performed and a reduction in the competitiveness of transport operations carried out using vehicles with a maximum permissible mass ≤ 3.5 t. Respondents most frequently indicated the loss of time advantage and a decrease in the profitability of operating vehicles in this category in international transport, and some companies had already discontinued their use earlier, referring to regulatory factors. Among the planned adaptation measures, shifting orders to heavy goods vehicles predominated. The obtained results suggest that after 1 July 2026 the use of vehicles with a maximum permissible mass ≤ 3.5 t in time-sensitive international transport may become limited, while their importance in urban distribution and last-mile deliveries is likely to be maintained. From a practical perspective, this may imply the need to modify supply chain planning, including, among other measures, increasing safety stock levels.

4.1. Possible Directions of Enterprise Adaptation and Market Implications

The planned actions declared by respondents, in particular the shifting of part of the orders to vehicles with a maximum permissible mass > 3.5 t, indicate the possibility of transferring part of the demand from the light vehicle segment to the heavy vehicle segment. This direction is consistent with the results of the activity sequence analysis, which show that once vehicles with a maximum permissible mass of 2.5–3.5 t are covered by the regulations effective from 1 July 2026, the previously shorter transport time achieved using this vehicle category (particularly in time-sensitive transport operations) will be significantly reduced.

In practice, this may result in a reduced role of vehicles with a maximum permissible mass ≤ 3.5 t in international transport requiring high temporal flexibility, especially in urgent and short-term operations. Consequently, enterprises may more frequently use organisational solutions such as a double-crew configuration in heavy goods transport or the reorganisation of schedules (e.g., staging of transport

operations, increasing the number of transshipment operations) [5].

From a broader perspective, the reduction of time flexibility in certain international relations may influence supply chain planning practices, particularly in Just in Time systems, leading to greater importance of time buffers and/or safety stock. This direction is consistent with the shift observed after supply chain disruptions during the COVID-19 pandemic towards strategies referred to as Just in Case [10]. The scope and pace of these changes will depend on the scale of regulatory enforcement, the availability of drivers, and the costs associated with organising a double-crew configuration.

4.2. Study Limitations and Further Research Directions

Further research should consider a broader set of routes and operational scenarios, as well as a more in-depth cost analysis, including labour costs, fleet and driver maintenance costs, freight costs in relation to the volume of goods transported, and the risk of delays, in order to assess more comprehensively the effects of the upcoming regulatory changes. The analysis should also cover the organisational structure of manufacturing enterprises and the changes that occurred following the introduction of the regulations, in the context of planning in Just in Time systems and a shift towards local supplier markets.

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