

Evaluation of Threats Occurring During Provision of Road Transport Services in the EU Territory by Small and Medium-Sized Companies from Poland

Marek Krzywonos¹

¹Department of Management, Krosno State College
ul. Rynek 1, 38-400 Krosno - Poland

Abstract— The aim of the paper is to conduct an analysis of various threats that may occur during road freight transport in the territory of the European Union. The research method consisted of a survey and the sample group selected for the survey were transport companies from eastern and southern Poland. The paper presents the current condition of Polish transport companies on the EU market and various threats that may occur while delivering road freight transport services. Polish carriers make a considerable contribution to international road freight and cabotage operations and Polish drivers constitute 9,99% of all employed in the industry in the EU. In 2016 Polish carriers delivered road freight services using 205,390 lorries. When it comes to threats, recent years brought about the emergence of new threats related to terrorism and mass migration. These threats constitute new challenges for Polish transport companies. Therefore, it would be a good idea to develop a model of good practices (recommendations) which would lead to improvements in the level of security during the process of rendering transport services.

Index Terms— road freight, transport of goods, threats related to transport, security management.

I. INTRODUCTION

Transport has always played an important role in human activity. In each consecutive century along advances of civilisation, its significance increased. Due to international division of labour transport has become the foundation of economic development and industrialisation. Nowadays, components for production can be manufactured thousands of kilometres from the place where the goods are finally assembled. Efficient transport system plays a key role in each national economy. Transport is a link which enables functioning of all other sectors of the economy therefore there

is a close relationship between development of transport systems and economic development. Effective and well-planned transport facilitates economic growth, and insufficient infrastructure constitutes a considerable barrier for development. Transport is sometimes referred to as the bloodstream of the economy enabling its smooth functioning. However, transport cannot exist for its own sake, it only serves an ancillary function for other sectors of the economy. In modern times the notion of transport embraces also a powerful shipping sector which combines transporting goods with a number of other logistic services.

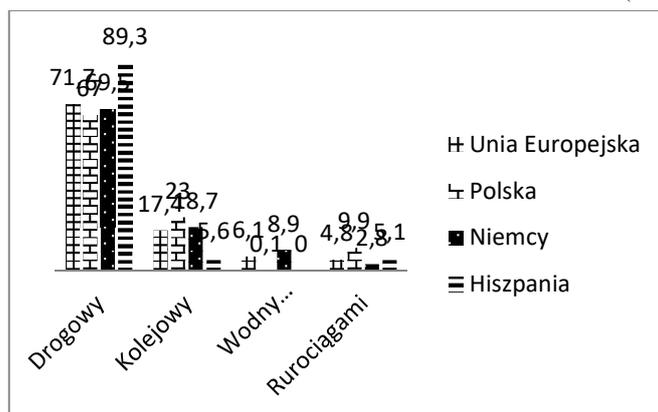
In all EU Member States including Poland, the most popular form of land transport (as for percentage of shipping tonne-kilometres) is road freight. The aim of the paper is to analyse various threats that may occur while delivering transport services by roads in the territory of the European Union. The conducted survey embraced transport companies located in southern and eastern Poland, Chart 1.

The percentage of road freight transport within Poland is similar to transport of goods to Germany and to other EU countries. A slightly lower (by 4,7%) percentage of road transport in shipment of goods in Poland is a consequence of higher than the EU average percentage of transport through pipelines and higher percentage of rail transport. Transit of oil and gas through the territory of Poland impacts the shares of other forms of transport. Spain which has a population similar to Poland, due to historic and geographic conditioning has considerably higher percentage of road transport.

Road transport owes its popularity to a number of important factors. The road network as compared to other forms of transport is the most dense and the most uniform. It is also well adjusted with respect to localisation of manufacturing plants and trade and consumption spots.



CHART 1. PERCENTAGE OF DIFFERENT FORMS OF TRANSPORT IN SHIPMENT OF GOODS IN 2015 (IN TONNE-KILOMETRES)



Source: Own work based on *EU Transport in Figures, Statistical Pocketbook, 2017*.

Road carriers dispose of vehicles which are capable of transporting almost all kinds of goods which may be shipped fast thanks to networks of motorways and dual carriage ways. In road transport goods are delivered directly from the sender to the receiver without the necessity to perform trans-shipment operations, which considerably shortens the delivery time. Road transport also enables servicing of small and dispersed volumes of freights (Neider, 2015).

II. POLISH TRANSPORT COMPANIES ON THE COMMON EUROPEAN MARKET

Thanks to extensive fleet of vehicles, employment volumes as well as the number of shipments expressed in tonne-kilometres, Polish transport companies occupy a prominent position on the European transport market, Table 1.

TABLE 1. DEVELOPMENT AND ACTUAL CONDITION OF POLISH COMPANIES IN THE SECTOR OF ROAD FREIGHT TRANSPORT

	Companies with licences to render international road freight transport services	Certified copies of the licence i.e. number of vehicles entitled to international road freight transport	Companies with certificates to carry out international road freight transport for their own purposes	Certified copies of certificates i.e. number of vehicles entitled to international road freight transport for own purposes
2006	16 311	92 283	4 497	10 327
2008	23 278	126 785	8 131	15 055
2010	24 895	137 502	7 196	15 772
2012	26 614	144 250	7 190	15 339
2014	29 488	168 645	7 474	15 787
2016	33 136	205 390	6 718	16 568
2017	34 633	217 984	6 244	16 388

Source: Own work based on reports of THE GENERAL INSPECTORATE OF ROAD TRANSPORT, <http://www.gitd.gov.pl/dla-przedsiębiorcow/raporty> (accessed 1 June 2018).

The level of economic development of Poland is not yet high enough to 'consume' transport services. Polish carriers offer their transport services to domestic but also, increasingly, to foreign customers. Originally, there were two main directions of road freight transport serviced by Polish companies: eastbound destinations (Russia and the Commonwealth of

Independent States) and westbound/southbound (the European Union Member States). Nevertheless, eastbound direction has lost its popularity due to the sanctions imposed on Russia in 2014 prohibiting import of food products. Another factor impacting the demand for transport services in the eastern direction is the war in the eastern parts of Ukraine. Thus, the only option that remains is west, towards the European Union market. It is a huge market where transport services can be carried out across countries or within territories of individual states.

Polish companies capitalised on the opportunities offered by the common European market. Within ten years the number of companies offering international road transport services doubled. The number of lorries owned by these companies also increased considerably. Such advances would not be possible without the advantages offered by the access to the common market. Among all existing forms of transport road freight transport is the least costly in terms of starting a business activity. The cost of purchase or leasing of a lorry is much lower than the cost of purchase of e.g. a barge or a plane, not to mention the construction of a pipeline.

Speaking of road transport one may not neglect almost 7,000 companies disposing of a fleet of 16,000 vehicles who carry freights by road for their own purposes (the General Inspectorate of Road Transport, 2017). They deliver their own goods to end-users or transport raw materials needed for production.

TABLE 2. NUMBER OF TRANSPORT COMPANIES AND THEIR FLEET USED IN ROAD FREIGHT TRANSPORT IN THE TERRITORY OF THE EUROPEAN UNION (AS FOR 31 DECEMBER 2017).

Possessed fleet of vehicles per company	Number of companies	Number of vehicles	Lorries used by companies by the fleet size (in %)
1	7 820	7 820	3,58
2-4	13 815	38 478	17,61
5-10	7 549	51 066	23,37
11-20	2 695	38 410	17,58
21-50	1 260	38 079	17,42
51-100	295	20 016	9,16
Pow. 100	137	24 678	11,29

Source: Own work based on reports of THE GENERAL INSPECTORATE OF ROAD TRANSPORT, <http://www.gitd.gov.pl/dla-przedsiębiorcow/raporty> (accessed 01 June 2018).

Polish road transport companies operating on the EU market are predominantly small or medium-sized enterprises disposing of a fleet of between 1 and 50 vehicles. These enterprises utilise 80.5% of all lorries and constitute 98.8% of all Polish carriers rendering transport services on the common European market. Fragmentation of the sector is a consequence of the fact that the Polish market of transport services is still quite young and the costs of setting up this particular business activity is relatively low when compared to other forms of transport services.

III. THREATS WHICH MAY OCCUR DURING ROAD FREIGHT TRANSPORT

The common market especially after deregulation of the 'small cabotage' in 2009, offers prospects for development of Polish road freight companies. However, the new threats that have emerged within the EU area require a complex approach to the issue of providing security. The threats that may occur during road freight transport evolve alongside changing geopolitical situation. The situation is dynamic: some threats fade away or disappear, some intensify and new ones emerge. Robbery of the vehicle with the transported cargo, still very popular at the turn of the 20th and 21st centuries (Filary, 2010), now occurs very rarely. But the newly emerged threats are difficult to foresee and counteract e.g. hijacking vehicles loaded with explosives and deliberately driving it into the crowds of people (Nice, Berlin, Stockholm). Counteracting such attacks is a real challenge from the rational point of view as many of them are the so called terrorist suicide acts (Kuć 2013). Terrorist organisations and the so called lone wolves all the time try to develop new, unexpected forms of attacks.

Mass migrations to the European Union have also given rise to new threats. Large groups of immigrants attempt to hide inside lorries in which they intend to cross borders. There were cases of attacks on drivers, vandalising their vehicles and cargo ('the jungle' in Calais). This method is especially popular among immigrants trying to enter the UK. Drivers and carrier companies may face high penalties for 'smuggling' illegal immigrants. When people are smuggled in trailers carrying food products the whole cargo must be disposed of (Dendera-Gruszka et al., 2017).

In an attempt to counteract road transport related threats it is necessary to concentrate on new as well as on the already existing dangers because they still pose a great risk for drivers, whereas the general tendency is to address only the threats which are extensively covered by the mass media, Table 3.

TABLE 3. THREATS IN ROAD FREIGHT TRANSPORT

Threat	Consequences (possible reactions)
Environmental	
Floods	Rising levels of water hinder or paralyze road transport (necessity to wait until the water levels drop or necessity to take detours).
Heavy falls of rain, snow, hail	Weather conditions impact road freight transport and cause delays in deliveries.
Heat waves, droughts, frost, icing	Lower exploitation parameters of vehicles, obstruction of transport, negative impact on the speed of deliveries.

Earthquakes	Earthquakes cause damages in road infrastructure and to means of transport.
Transport system related threats	
Social unrests (strikes, demonstrations, road blockages)	They obstruct road transport, force drivers to wait or to search for detours.
Environmental pollution (radioactive, chemical, biological)	Pollution forces drivers to take detours and perform decontamination procedures.
Epidemics (among people and animals)	Some areas become closed for transport, additional precautions become necessary and disinfection activities must be performed.
Technical failures of loading hubs/docks	Delays in delivery times.
Technical failures of power systems or teleinformation systems	Impediments for transport, disturbing free flow of information between carriers (drivers) and contractors.
Internal	
Staff going on strike	Destabilisation of road transport, obstruction of deliveries. Reaction: negotiations of pay and work conditions with the workforce.
Technical failure of a means of transport	Such failures result in delays in transport and increase possibility of an accident.
Human error	Human errors may lead to accidents or other dangers in the course of transporting goods.
Crime	
Theft of fuel (attempted theft of fuel)	Theft or attempted theft of fuel when the vehicle is stationary (often during night break).
Theft of cargo (attempted theft of cargo)	Theft or attempted theft of cargo very often involves using force towards the driver.
Theft or attempted theft of personal belongings of a driver	Theft or attempted theft of a driver's personal belongings may disrupt the delivery as the driver will not be able to buy petrol without cash or bank cards.
Terrorism	
Hijacking a lorry	Hijacking for ransom or to use the vehicle in a terrorist attack.
Vandalising a means of transport or elements of transport infrastructure	Arson or planting and detonating an explosive charge.
Mass migration	
Physical assaults on drivers	Assaults which are supposed to force drivers to hide people in the vehicle and move them across the border.
Vandalizing vehicles and cargos	Immigrants often vandalize vehicles (especially trailers and cargo) while attempting to get inside.
Financial penalties for 'smuggling immigrants'	Despite not being aware of carrying immigrants in trailers, drivers and carriers are imposed high financial penalties for smuggling (Great Britain).

Source: Own work based on Siergiejczyk, Dziula 2013; Dendera-Gruszka et al. 2017; Nowacki 2012; Szymonik 2016; Krystek et al. 2008.

The above mentioned threats may occur individually or in bigger numbers at the same time which considerably exacerbates risks. Because the nature of threats is so diversified it is necessary to apply a complex approach which will embrace the highest possible number of threats.

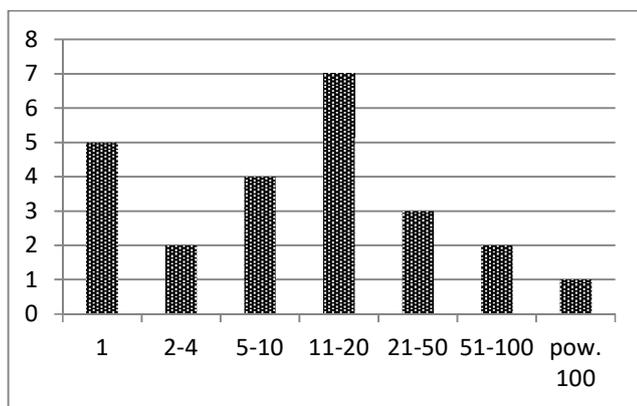
IV. THREATS IN ROAD FREIGHT TRANSPORT IN THE TERRITORY OF THE EUROPEAN UNION AS SEEN BY REPRESENTATIVES OF POLISH TRANSPORT COMPANIES

The survey prepared for the purposes of this publication was sent to 100 randomly selected transport companies registered in eastern and southern Poland and 24 fully completed

questionnaires were returned. A considerable number of entrepreneurs observed that the ratios under examination in the survey were of sensitive nature, therefore they were reluctant to disclose some figures. Some entrepreneurs simply refused to complete the questionnaire without giving a reason. The survey applied the methodology of the Inspectorate of Road Transport, which publishes annual reports on transport enterprises and the number of vehicles they use, Chart 2.

The respondents admitted that during execution of deliveries in the territory of the EU the drivers have encountered a number of threats. Table 4 contains a collection of threats mentioned by the respondents. The most frequent occurrences were related to criminal activity i.e. theft or attempted theft of fuel, cargo or personal belongings of drivers.

CHART 2. STRUCTURE OF ENTITIES BY THE SIZE OF THE FLEET



Source: Own work.

The theft of fuel or attempted theft of fuel seem to be the biggest threat as two thirds of respondents have experienced it, Table 4.

TABLE 4. THREATS MENTIONED BY RESPONDENTS

Threats	Percentage of companies which experienced threats
Theft of attempted theft of fuel.	66,67%
Theft or attempted theft of cargo.	41,67%
Theft or attempted theft of driver's personal belongings.	33,33%
Failed attempts to hide and cross the border in the trailer (illegal immigrants hidden in the vehicle were discovered by the border police).	25,00%
Damage to the trailer and/or cargo by illegal immigrants who attempted to get inside the vehicle.	41,67%
Verbal threats or battery aimed at forcing drivers to hide illegal immigrants in trailers and move them across the border.	8,33%
Roadblocks aimed at hiding illegal immigrants in trailers and moving them across the border.	37,50%
Damage to vehicles or attempts to disconnect the set (cabover truck and trailer) without the knowledge of the drivers by drivers from the countries of 'the old Union' who are inspired by the smear campaigns of the	0,00%

media against growing importance of Polish transport companies on European roads.	
Assault or attempted assault on the driver.	29,17%

Source: own work.

The threats connected with mass migrations are a serious issue for transport companies: 41.6% of respondents admitted to having their trailers damaged by people trying to hide inside; 37.5% encountered roadblocks which were supposed to force drivers to transfer illegal immigrants across the border; in six cases (25% of examined companies) the immigrants succeeded in hiding inside the trailers but were found by the border police; in two cases illegal immigrants used verbal threats in attempt to get inside the trailer; there were also seven assaults or attempted assaults on drivers.

The new EU Directive on delegated workers, when it starts to be binding, will have a negative impact on Polish transport companies providing services in the territory of the European Union. The media in the countries of the western EU create a tense atmosphere around transport companies from the 'new Union' Member States, therefore, one of the questions in the survey concerned the incidents of attempted vandalizing of vehicles or disconnection of sets of cabover trucks and trailers performed by employees of the transport sector from the 'old Union' countries. There were reports of such occurrences on Polish information portals, however, none of the respondents to the survey confirmed it.

A considerable number of respondents mentioned disturbances and disruptions in transport: 54,17% experienced damages to cargo, 20,83% did not manage to deliver the freight on time on several occasions. Fortunately, there were no reports of injuries of the driver that accompanied the occurrence of the above mentioned threats. In above 40% of the surveyed companies there were no disruption to deliveries in connection with threats listed in Table 4.

TABLE 5. DISRUPTION IN TRANSPORT ENCOUNTERED BY DRIVERS FROM THE SURVEYED COMPANIES.

Disruption in transport	Percentage of companies suffering from the disruption
Injury of the driver	0%
Damage to cargo	54,17%
Delays in delivery	20,83%
No such cases	41,67%

Source: Own work.

As shown by the results of the survey, 66.67% of the companies is taking steps towards improving the overall security of drivers, vehicles and transported goods. The methods applied in this respect are gathered in Table 6.

TABLE 6. METHODS OF MINIMIZATION OF THREATS USED BY THE SURVEYED COMPANIES

METHODS AIMED AT REDUCTION OF THREATS	Percentage of companies
Using GPS systems.	54,17%
Training drivers how to react under potential threat (e.g. during attempted theft they must not leave the vehicle and must call law enforcement agencies without endangering their own health or life).	20,83%
Changing routes (avoiding certain potentially dangerous areas).	25,00%
Declining jobs which require driving through dangerous areas or where loading or unloading activities must be performed in a dangerous place.	12,50%
Designating routes so that drivers can take recess in places which are safe.	41,67%
Using mobile applications	33,33%
Using guarded car parks which are paid by the company.	25,00%

Source: Own work.

According to the conducted research, the most frequently used method of minimization of risks among Polish transport companies is using GPS systems, using mobile applications, training drivers how to approach threats and how to react to them, implementing procedures regarding alternative routes which evade dangerous regions etc. Some companies decline jobs which require transit through dangerous zones or loading or unloading in risky places.

V. CONCLUSIONS

The conducted survey allowed the author to conduct an introductory analysis of threats occurring in road freight transport across the European Union and to propose a list of solutions which would reduce the risk of their occurrence. Polish carriers are faced with a number of threats while providing transport services in the EU countries. The most common threat is related to criminal activity (theft or attempted theft) but incidents concerning illegal immigrants, which have widely been covered by European mass media, have also been experienced by Polish drivers. On the other hand, the respondents did not confirm the existence of the threat of unlawful activity of rival companies from the western countries of the European Union.

Further research must be done into issues of providing higher levels of security in international road transport. It would be useful to develop a model of good practices (recommendations) which would support Polish transport companies in taking a better care of their drivers and cargo while providing international road freight services. It is a space where science should enter the world of business and make contribution towards assuring higher levels of security of Polish transport companies.

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