

SAFETY OF TRANSPORTATION OF OVERSIZED AND EXCESSIVE LOADS

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Summary: The paper is dealing with the issues of safety in planning and realization of oversized and excessive goods transportation. It points to the growing importance of these transportations for the economy of the state. Further it points to selected risks that could cause the emergency event during this transportation and possibilities of their elimination, which may lead to the increased safety of transportation of oversized and excessive loads.

Keywords: safety, transport, oversized, excessive, protection, special.

INTRODUCTION

The transport of oversized and excessive loads is realized with use of different modes of transport. The road transport is the most important mode of transport used for the above mentioned loads transportation in the Slovak Republic. Oversized and excessive transportation is specific due to exceeding some permissible sizes or weights in comparison with transportation of other loads. Transportation of oversized and excessive loads is also characterized by other risks of emergency events occurrence that are minimal for normal freight transport. Safety and health protection during transportation of oversized and excessive goods are directly influenced by human factor, means of transport and environment. The aim of the authors is to highlight some of them.

1. OVERSIZED AND EXCESSIVE LOADS TRANSPORTATION ON ROADS

Within the scientific and technological progress associated with the development of the Slovak economy it is needed to realize a variety of transportation of various kinds of cargo in the field of industry and building. Transport of any cargo is affected by a variety of conditions. The most important are the safety, speed of transportation etc. It is fully associated also with transport of the oversized and excessive goods. These transportations are referred to as special. They can be realized only by an appropriately licensed carrier, who in addition to basic professional knowledge of road transport must be competent also for the special requirements of this type of transport. (1).

In terms of international law, the maximum weight respectively, axle loads and external dimensions of road vehicles operating in the EU are mentioned in Directives 85/3/EEC, 86/360/ EEC, 86/364/ EEC, 88/218/ EEC, 89/338 /EEC, 89/460/EEC, 89/461/ EEC

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and 91/60/ EEC. In terms of the Slovak Republic, they are solved for example by Government Regulation No. 349 (2), road law (3), etc. In Slovakia, excessive and oversized load is considered that carriage in which the vehicle or combination of vehicles in transit exceeds the maximum permissible dimensions specified in Annex 1 (2) or maximum permissible weights (2 - Section 4) or if the vehicle or combination of vehicles transport indivisible cargo exceeding maximum permissible dimensions and maximum permissible weight, it can be used in road traffic only based on a permit for special use in accordance with the road Act (3). The special use of roads, according to (3) means the use of highways, roads and tertiary roads other than the usual way or for the purposes other than those designated for roads

In 2015 there was a significant increase in transportation of oversized and excessive loads (Table 1).

Table 1 – Selected data on over-limit transportation for the period 2011 - 2015

Monitored data	Year				
	2011	2012	2013	2014	2015
The total number of transportations	291	230	192	236	337
The total length of the routes [km]	49 068	35 416	26 453	28 991	34 913
The number of routes with defined detours	57	30	18	8	19
Total tonnage transported [t]	26 828	22 270	19 484	21 676	35 840
The total number of transportations from the state border of the SR	117	61	67	67	118
The total number of transportations to the state border of the SR	82	53	27	27	46
The greatest width of set [m]	7,15	7,50	5,80	7,96	7,50
The greatest height of set [m]	6,00	5,57	8,80	5,90	6,75
The greatest length of set [m]	75,00	71,00	75,00	63,00	58,60
The greatest total weight of set [t]	490,00	424,00	426,00	434,40	287,22
The longest proven route [km]	1031,40	1167,00	559,95	614,07	543,79

Source: 4

2. THE POTENTIAL RISKS RELATED TO THE OVERSIZED AND EXCESSIVE TRANSPORTATION

Risk describes a situation which can be predicted with a certain degree of reliability. (5). This also affects the oversized and excessive transportations. In addition to the risks arising from classic transportation, oversized and /or excessive goods transportation require to take into account also risks arising from (6):

- Exceeding the weight:
 - the risk of damage to the bridge construction for the reasons of its overloading,
 - the risk of damage to the road surface,
 - the risk of damage to the vehicle and /or semi-trailer which transport cargo,
- Exceeding the dimensions:

- the risk of damage to nearby transport facilities due to exceeding permitted width and height,
- the risk of critical sub-path which due to its height does not meet the height of transported goods,
- the risk of critical crossroad occurrence,
- the risk of traffic congestion.

Oversized or excessive transport may be carried out only by the carrier having the necessary technical basis and trained crew vehicles. The carrier shall ensure that:

- transportation does not endanger life or health of other road users,
- does not cause damage to roads and transport facilities and installations,
- does not cause damage to the property of the others,
- reduce the threat to safety and traffic flow restriction.

Therefore such activities are in the most cases realized by special transportation companies. In many cases, however, this type of traffic is realized by building and road firms for their own use, for example in case of transport of heavy and bulky machines and mechanisms.

3. SAFETY BEFORE AND AFTER REALIAZION OF SPECIAL TRANSPORTATIONS

Transport of excessive and oversized objects is one of the specific forms of use of the roads. For this reason, it is necessary to pay maximum attention to ensure not only the safety of traffic and its participants, but also the health and safety of persons who ensure the implementation, or will be present in the vicinity of such special transport although are not participants in the road traffic.

Each such transport has a specific character, which is determined by the nature of the load (e.g. dimensions, centre of gravity, the possibility of mounting the load on a vehicle etc.), road (e.g. the technical conditions of the road, transport constructions, traffic signs and equipment, the quality of the access road), the manner of its solution, mutual communication of persons engaged in its implementation, etc. It follows that the implementation of oversized and excessive transportation requires, inter alia:

- close cooperation:
 - the carrier and shipper,
 - with other institutions and bodies responsible for safety and the road traffic on the selected route,
 - with the owners and managers of selected plots, which may affect transport,
- information on local traffic conditions,
- knowledge of the laws of the states, regions and municipalities through which the transportation will be implemented,
- correct choice of route and thorough research,
- processing documentation to ensure the transport (e.g. transport plan, applications for transportation, etc.):

- after receiving the application the check of the accuracy and completeness of the required documents is realized,
 - the assessment or proposal of the route is realized,
 - outputs describing the itinerary are elaborated,
 - the maps showing the transport routes are elaborated,
 - forms for the expression of various road managers are prepared,
 - final report is elaborated,
 - after completion of all the documents the whole agenda is sent to the carrier (applicant) (7),
- selection of a suitable special transport, shipping and handling equipment and their subsequent use,
 - control of a special vehicles descriptive designation, which highlights the special transport,
 - increased caution when loading, unloading and fixation of cargo,
 - ensuring accompanying vehicles,
 - treatment of critical points along the route of transport, etc.

During the transport of oversized and excessive loads, in view of the fact that it is a specific type of transport, these requirements for have to be met:

- Construction of transport equipment and its labelling. Transportation is largely realized with sets a motor vehicle with trailer (low loader) or special transport vehicles, which are destined for this transport. From a security standpoint, except good technical condition of the vehicle, the most important is its security sign with special warning lights (orange colour) and a special label with the words "special transport" or "exceptional transport". In case of international excessive or oversized transport the text may be in the language of the Member State of the European Union or in the language of another country which is party to the Agreement on the European Economic Area (e.g. "SONDERTRANSPORT", "CONVOI EXCEPTIONNEL", etc.). In addition to this text which is the front of the vehicle, the relevant security label must be also at the end of the vehicle or the load (Fig. 1).



Source: Authors

Fig. 1 - Labelling of vehicle

- Professional preparedness of all drivers (including accompanying vehicles) and other persons involved in a specific transportation. Lessons respectively training

of accompanying vehicles staff as well as drivers of vehicles with excessive and oversized transportation should be directed to (7):

- the terminology relating to excessive and oversized transportation,
 - the risks during transport resulting from excessive and oversized transportation,
 - the rights, obligations and responsibilities of persons involved in the carriage,
 - the familiarity with the general procedures and requirements of the excessive and oversized transportation,
 - requirements for transport and means of transport used for transporting and securing a load and identification of vehicles and cargo,
 - the technology of transport through tunnels, underpasses, overpasses and bridges,
 - the cooperation and communication between the drivers and crews of accompanying vehicles,
 - principles of defensive strategies in the management - response to the improper behaviour of other road users and behaviour in conflict situations,
 - the knowledge of transport geography (familiarization with the route of the transportation).
- Securing the load. This is an effective fixation of transported load, which depends mainly on the correct determination of the centre of gravity, what may be in the transport of heavy and oversized cargo extremely difficult. Loading and fixation of load is on Fig. 2.



Source: Authors

Fig. 2 - Loading and fixation of load

- Transportation technology, which depends on the particular kind of the load and is closely connected with the route of the transportation and the ways of overcoming the critical points. In determining the route its profile, load capacity of bridges, traffic volume, parameters of intersections, level railway crossings and underpass heights (e.g. in case of long loads it is important to know the exact radius of the road curves, in case of extremely heavy loads the route which bypasses bridges is determined, in case of oversized loads the overhang into next traffic lanes is determined) are assessed. In some cases there may be

obstacles such as electric conductors, power cables and the like. In this case requirement for administrator of lines to disconnect lines during passage of a vehicle (set) is needed.

- Accompanying during transport. Excessive and oversized transportation can, due to its size and weight, significantly hamper or seriously endanger road safety. To minimize this risk, in certain cases the escort of these transportations is required. The escort can be realized by own vehicle of the transporter equipped with orange warning lights and other supplementary indication (e.g. the label Oversize transport, as shown in Fig. 3), or by police – police vehicles escort (in exceptional circumstances). Basic functions of the escort are:
 - warning for other road users to danger or an obstacle on the road in the form of excessive and /or oversized cargo,
 - help for drivers of vehicles to overcome the risk laps (e.g. narrow spaces, bridges, etc.),
 - the management of traffic in critical areas (e.g. at junctions, bridges, roundabouts, etc.).



Source: Authors

Fig. 3 – Accompanying vehicle marking

Implementation of transport should be discussed with the relevant road authorities well in advance so that the applicant could ensure verification and approval of defined route by competent authorities.

CONCLUSION

The implementation of the oversized and excessive transportation is a relatively complicated process. Transportation must be realized in so way not to cause damage to the body of the road, road objects (bridges, tunnels, retaining walls, etc.) and the road equipment (traffic signs, crash barriers, railings, etc.). Possible damage must be immediately reported to the administrator and paid by the carrier. The carrier is responsible for damages caused during transportation, whether to organizations or citizens. For preventing damages or minimize them the carrier must pay maximum attention to the process of planning and implementing the transport of oversized and excessive load with focus on ensuring the safety of persons.

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