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**Mapping of road freight transport flows  
crossing the South Moravian Region**

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**07/2021**



## 1. Home

KORDIS conducted a survey focused on freight transport in the South Moravian Region. The aim was to qualitatively determine the number of trucks passing through the South Moravian Region with their origin and destination outside the Czech Republic, primarily along the Orient-East Med corridor axis (D2 and D1 motorways). In addition, we collected other details and habits of drivers such as driving time, number of overnight stays, or the nature of goods transported. The results will continue to serve as a basis for quantitative research commissioned by Masaryk University and conducted on top of the data from the Czech Roads and Motorways Directorate.

## 2. Methodology

The interviews took place on 22-24 September and 1 October 2020 and were conducted throughout the day. A total of seven interviewers participated in the survey, contacting randomly selected truck drivers of different nationalities. They focused mainly on trucks transiting through the South Moravian Region, i.e. only passing through the area, not having their source or destination here. The survey took place at three rest areas along the motorways near Brno, in both directions. These rest areas were selected on the basis of a pre-survey carried out in February 2020, during which our staff mapped the car parks and rest areas along the motorways of the South Moravian Region in order to determine their utilisation and the national representation of carriers. Based on the results of the pre-survey, we selected the three busiest rest areas, which we then used as the location for the survey:

- **Devět křížů** - in the northwestern part of the region near Velké Bíteš, near the D1 motorway,
- **Rohlenka** - roughly in the centre of the region, near Brno, on the D1 motorway,
- **Lanžhot** - in the southern part, near Břeclav, on the D2 motorway on the border with Slovakia.

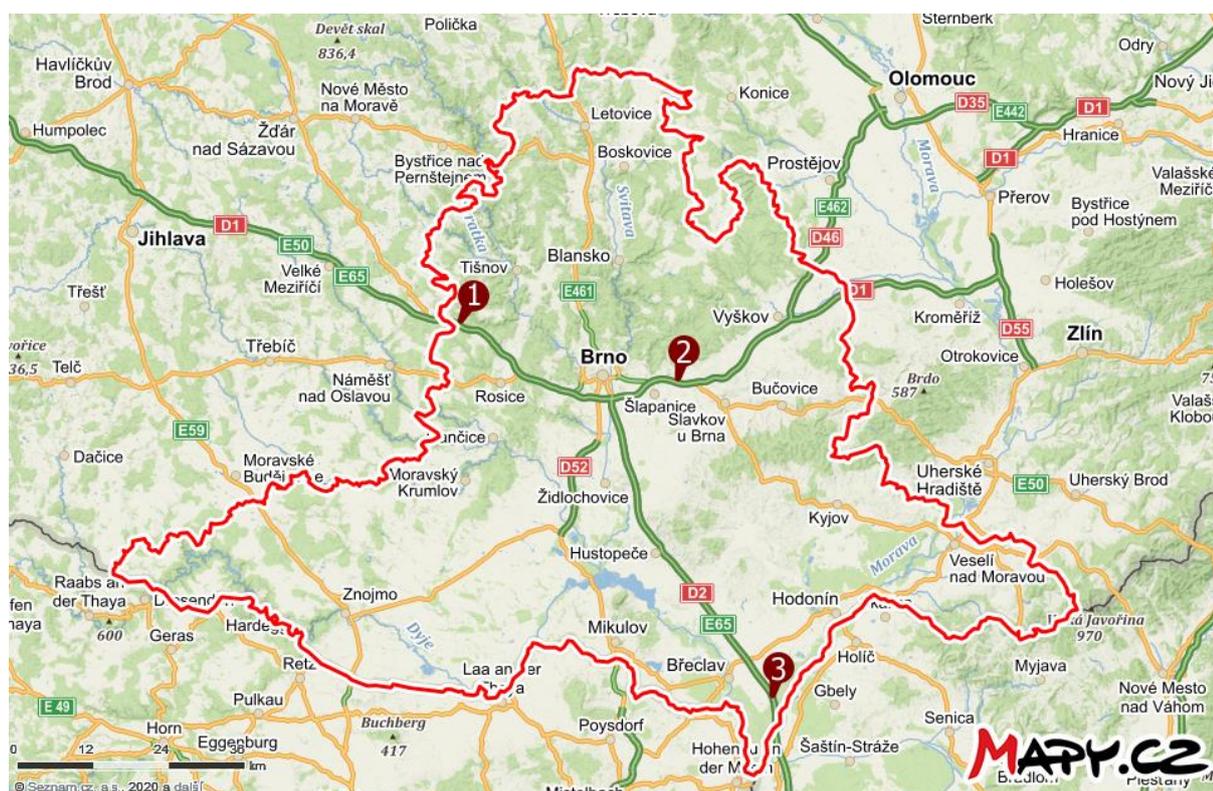




Fig. 1: Highway rest areas where the survey was conducted. 1 - Devět křížů, 2 - Rohlenka, 3 - Lanžhot.

The pre-survey was also used to determine the proportion of each nationality in order to prepare the language versions of the questionnaires. In total, we created twelve language versions of the questionnaire (Czech, English, Bulgarian, Croatian, Hungarian, Lithuanian, Polish, Romanian, Slovenian, Serbian, Turkish, Ukrainian).

We are aware that to improve the quality of the results, the survey would need to be conducted over a longer period of time, preferably several times during the year, but the parameters of this project do not allow us to do this.

## 3. Survey results

### 3.1. Truck routes

A total of 552 questionnaires were completed. Of these, 16 lacked the necessary information and had to be discarded. The data from the remaining questionnaires were processed and sorted by truck route. On the basis of these data, 4 routes were compiled (each route includes the opposite direction):

- Břeclav - Prague,
- Břeclav - Ostrava,
- Prague - Ostrava,
- Vienna - Ostrava.

At each rest stop, interviewers spent an equal amount of time interviewing drivers. Not all rest areas show the same truck traffic, so the numbers of completed surveys vary. Under the available conditions, where it is not possible to obtain responses from every driver, this methodology can be considered sufficient. The following table shows the numbers of trucks by route.

Table 1: Number of trucks by route.

Route number	Route	Number of trucks
1.	Břeclav - Prague	423
2.	Břeclav - Ostrava	58
3.	Prague - Ostrava	27
4.	Vienna - Ostrava	26

The table shows that the first route Břeclav - Prague (and vice versa) is the busiest. The main objective of the research was to find out the starting and destination of trucks and the direction was not important for us, so we merged both directions into one unit. Since this is a sufficiently large data set, we can consider the data statistically conclusive. For this reason, it was decided to continue working only with data from the first route, Břeclav-Prague

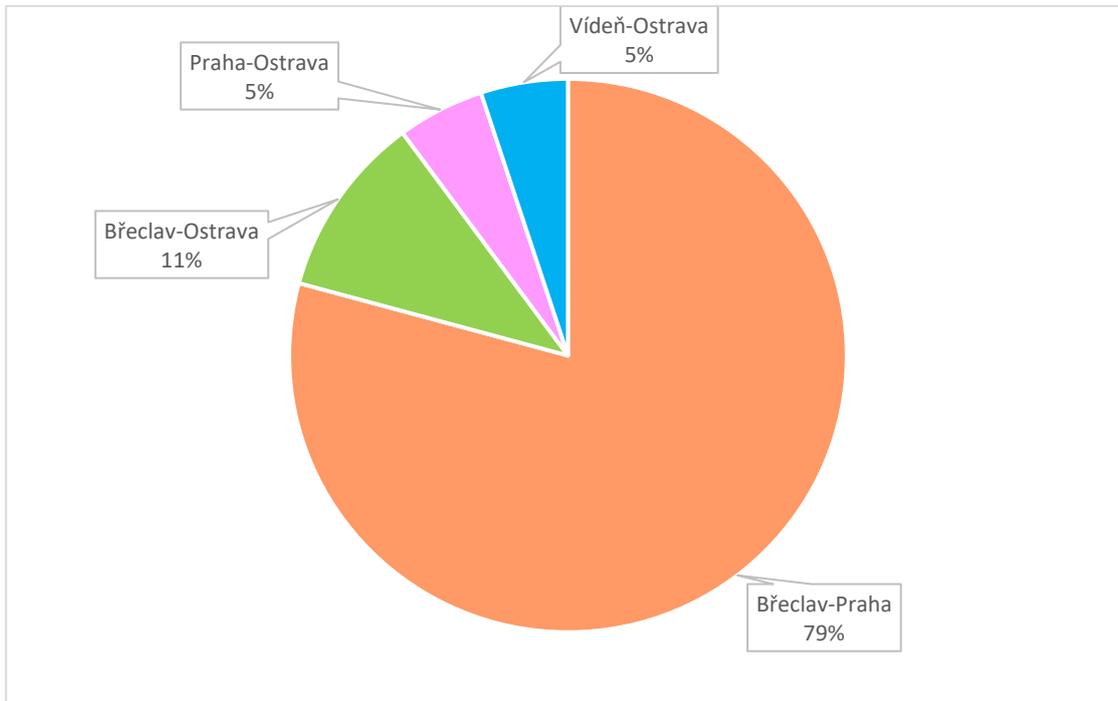


Figure 2: Graph of the share of trucks by route.

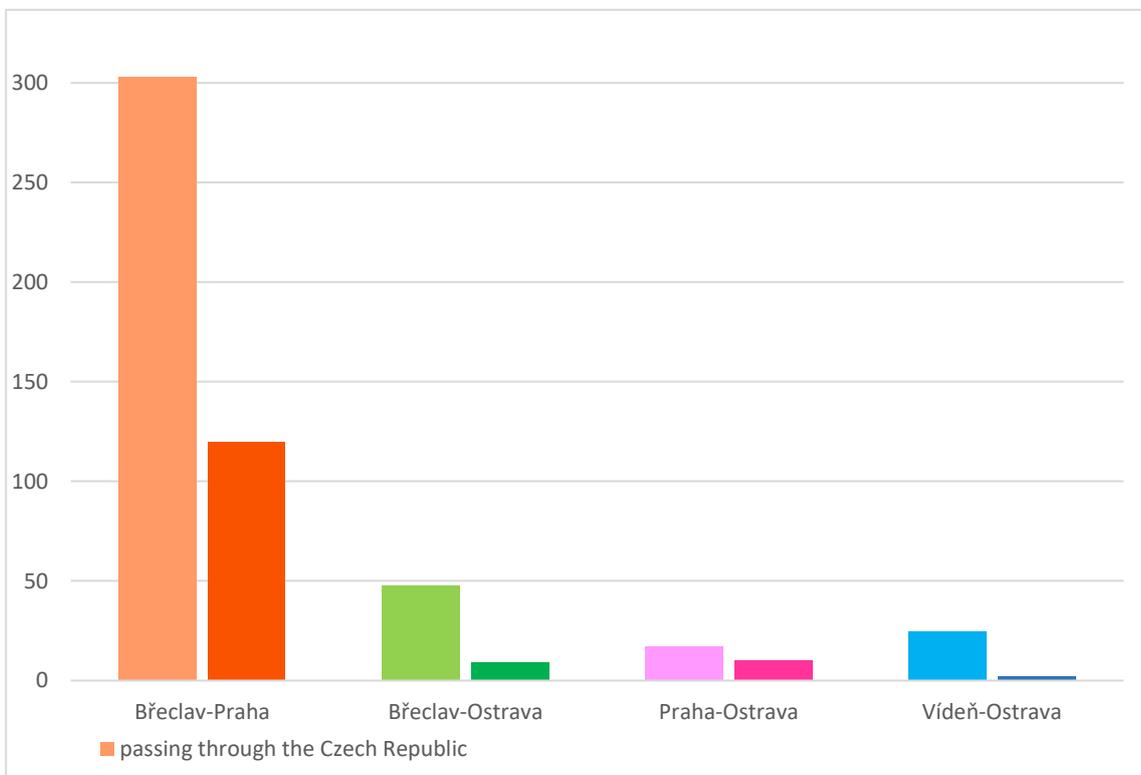


Figure 3: Graph of the number of trucks by individual routes, taking into account vehicles that end or start in the Czech Republic.



### 3.2. Starting and destination countries

The survey also looked at the most common source and destination countries.

The largest number of respondents were drivers going from Hungary to Germany (and vice versa), then from Romania or Slovakia to Germany and from Hungary to the Czech Republic. The values can be compared in the following table and map.

Table 2: Number of trucks by country of origin and destination (sum of both directions).

Starting and destination country	Number of trucks
Hungary - Germany	59
Romania - Germany	37
Slovakia - Germany	37
Hungary - Czech Republic	36
Slovakia - Czech Republic	21
Serbia - Czech Republic	16
Other	330

### 3.2.1. Starting and destination countries - all vehicles

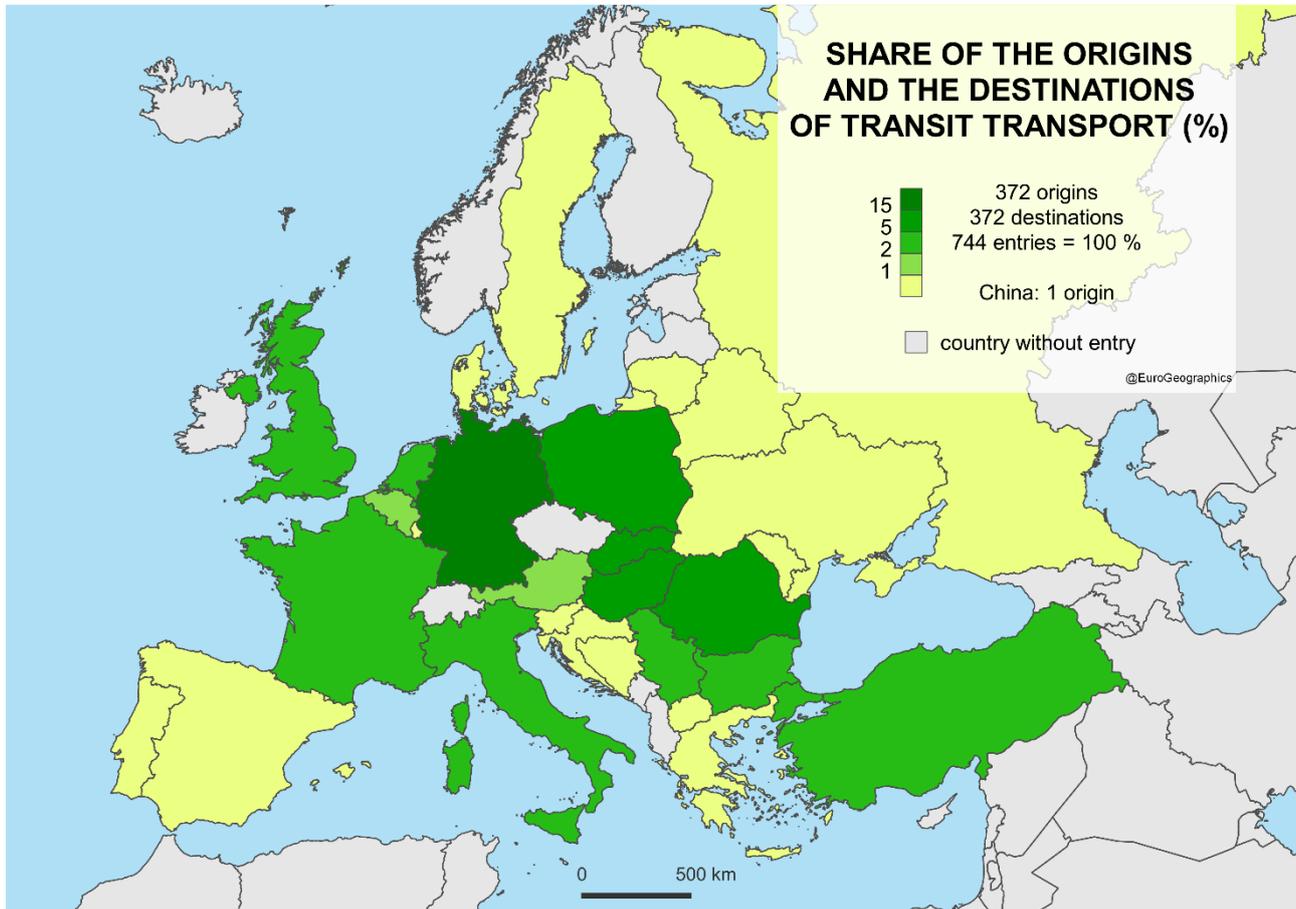


Figure 4: Share of countries of origin and destination of transit transport through the Czech Republic.

### 3.2.2. NUTS regions - all vehicles

In order to identify both source and target areas more precisely, a code has been assigned to each city based on the NUTS breakdown. The results are shown in the map below. The most common source and destination areas are Slovakia, Hungary, Romania and Poland near the border with the Czech Republic.

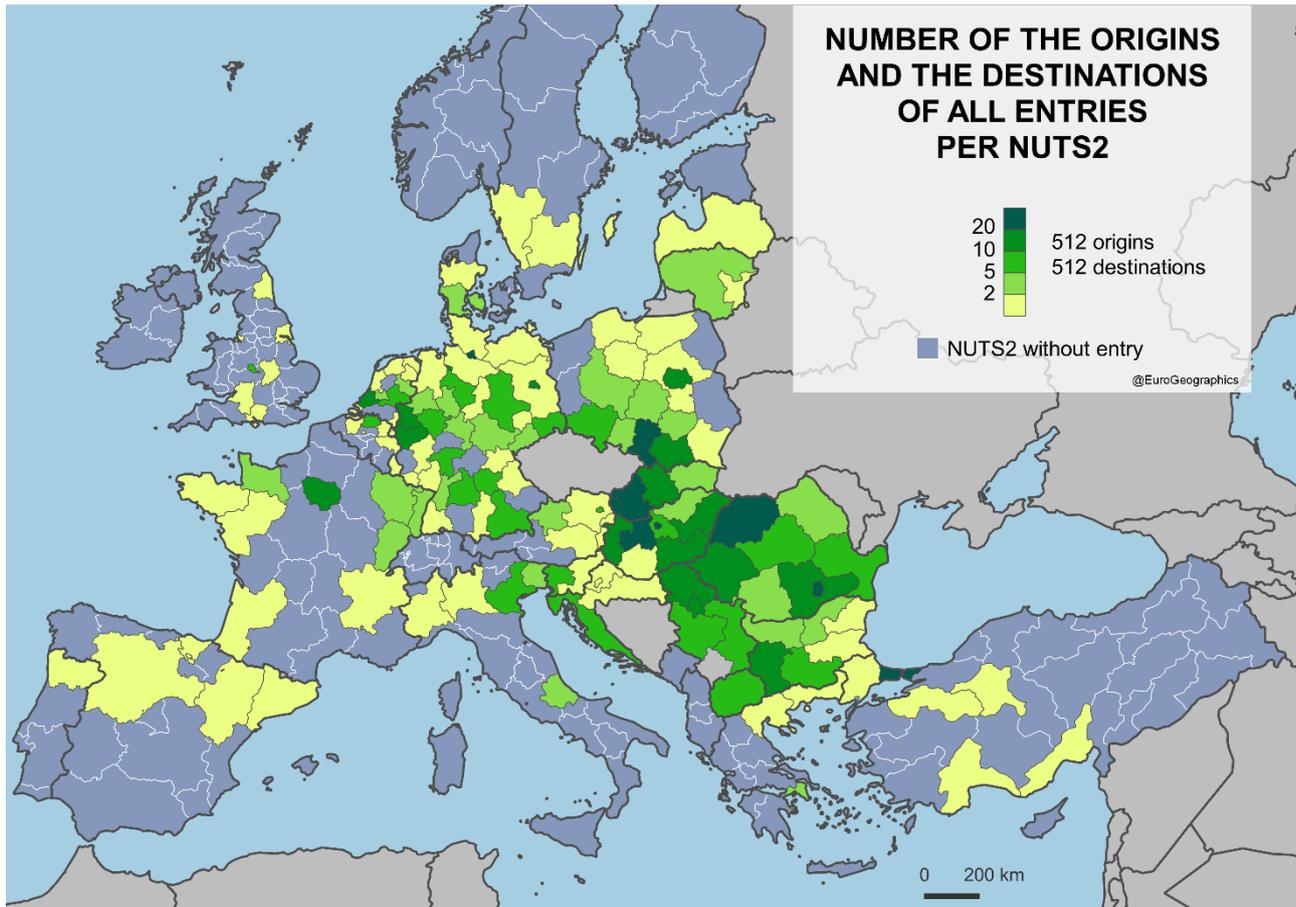


Figure 5: Number of source and destination areas of all truck traffic (both through and originating or destined in the Czech Republic) passing through the Czech Republic by NUTS breakdown.

### 3.2.3. NUTS areas - passing vehicles only

The situation is similar for trucks that only pass through the Czech Republic, with the most common areas being southern Poland, the Bratislava region, eastern and western Hungary, northern Romania and Bulgaria, as well as the capitals of these states.

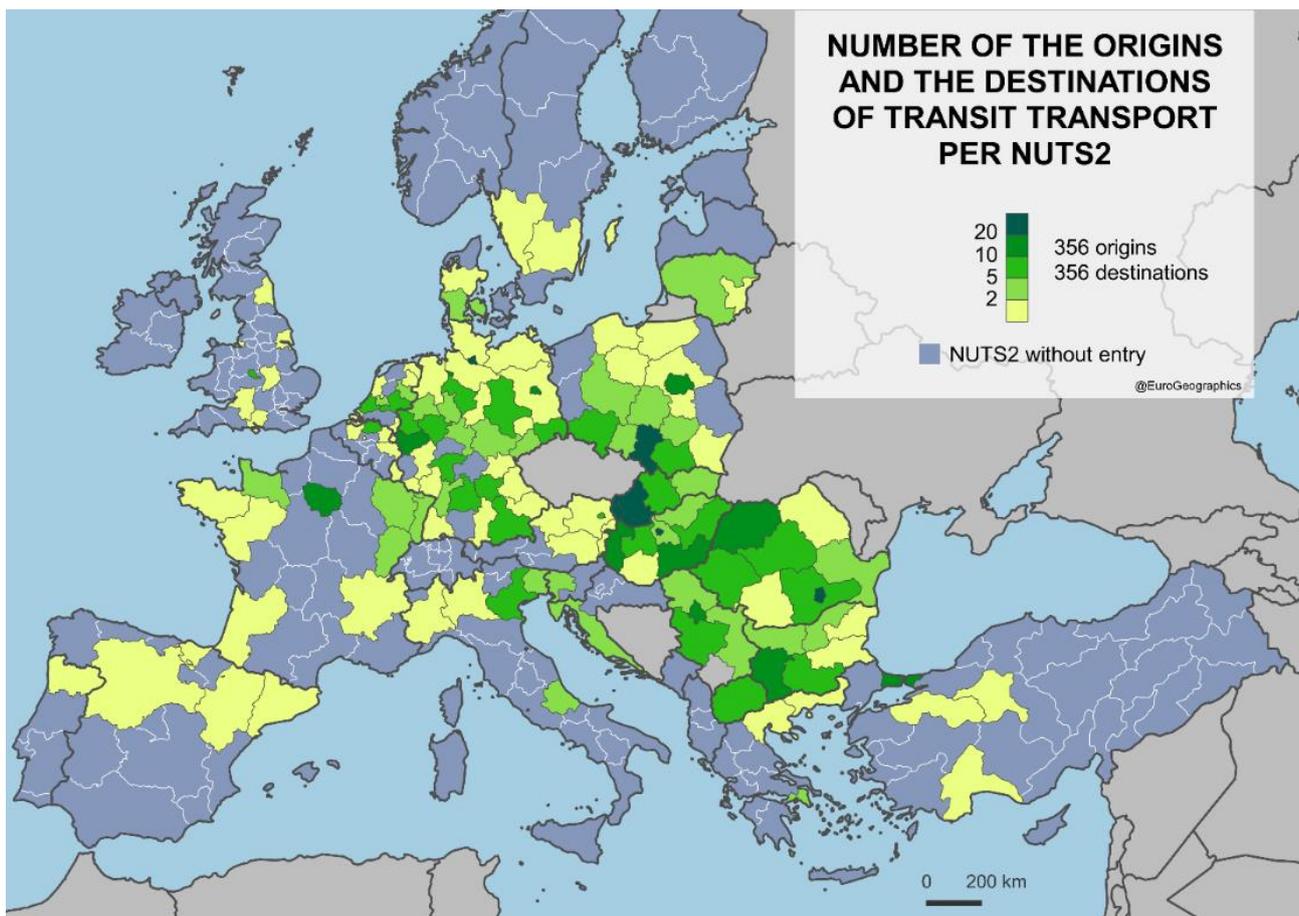


Figure 6: Number of source and destination areas of transit truck traffic through the Czech Republic by NUTS breakdown (trucks passing through the Czech Republic).

### 3.2.4. NUTS areas - only vehicles with a source or destination in the Czech Republic

We were also interested in information about trucks with a starting or destination point in the Czech Republic. Compared to the two previous maps, it is noticeable that the source and destination areas are mainly located to the south-east of the Czech Republic (Slovakia, Hungary, Romania, Serbia, Bulgaria), in the south of Poland and in Croatia.

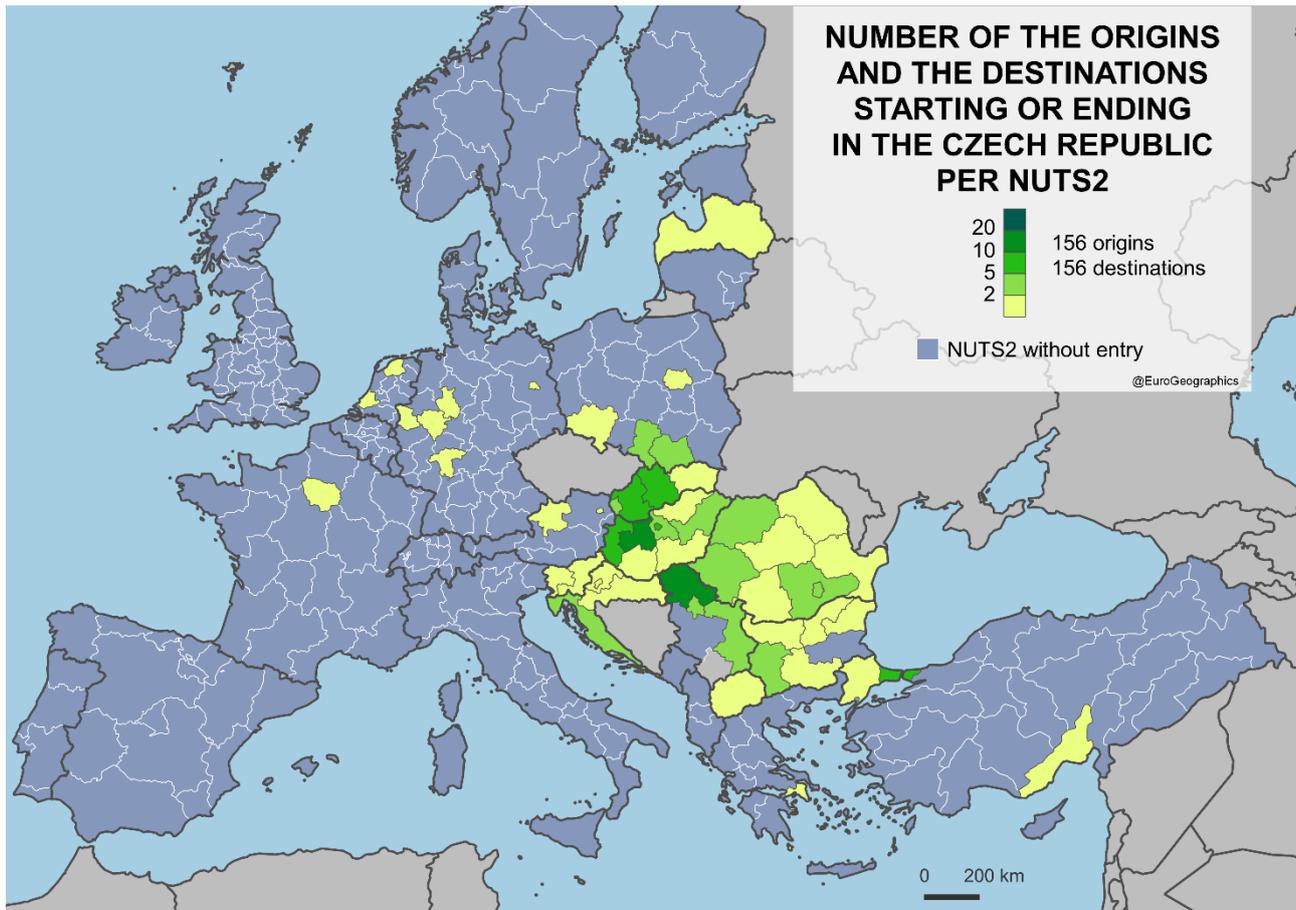


Figure 7: Number of origins and destinations of transit traffic passing through the Czech Republic that has its source or destination in the Czech Republic.

### 3.2.5. Routes - all vehicles

We have also marked the starting and destination areas of truck traffic through the Czech Republic using the so-called flow map. This map shows the volume of traffic going to a given area by the thickness of the line. The brown line indicates the Orient/East-Med TEN-T corridor. The map shows that, with few exceptions, traffic flows follow the location of the OEM corridor.

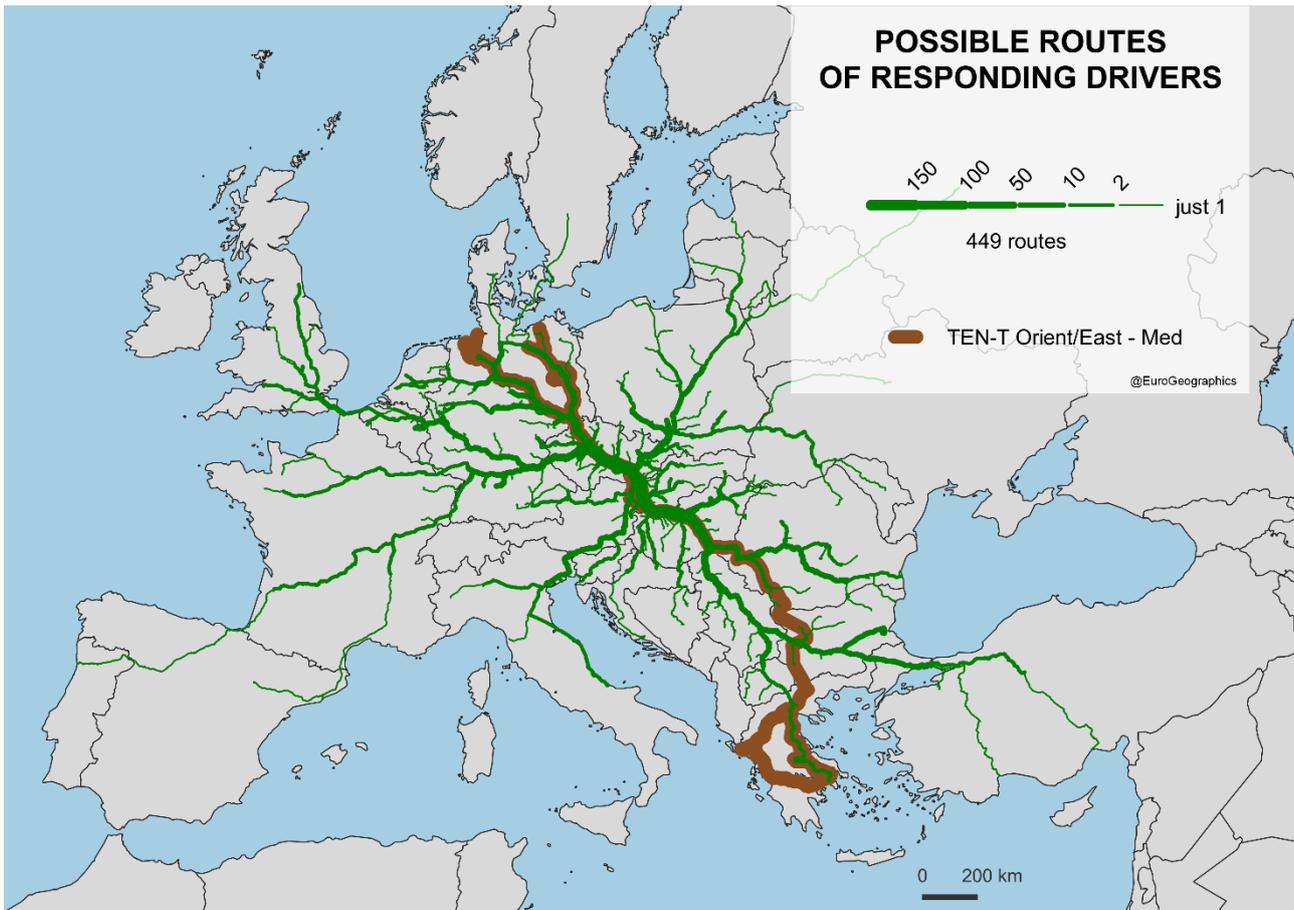


Figure 8: Representation of origin and destination areas of truck traffic crossing the Czech Republic.

### 3.2.6. Driving directions - Germany

As a large part of the trucks were heading to/from Germany, a flow map was created to show the German area in more detail. On the map it is possible to notice the most significant traffic flow from Ústí nad Labem to the Hannover and Berlin area. From Pilsen, most of the trucks are heading to Nuremberg.

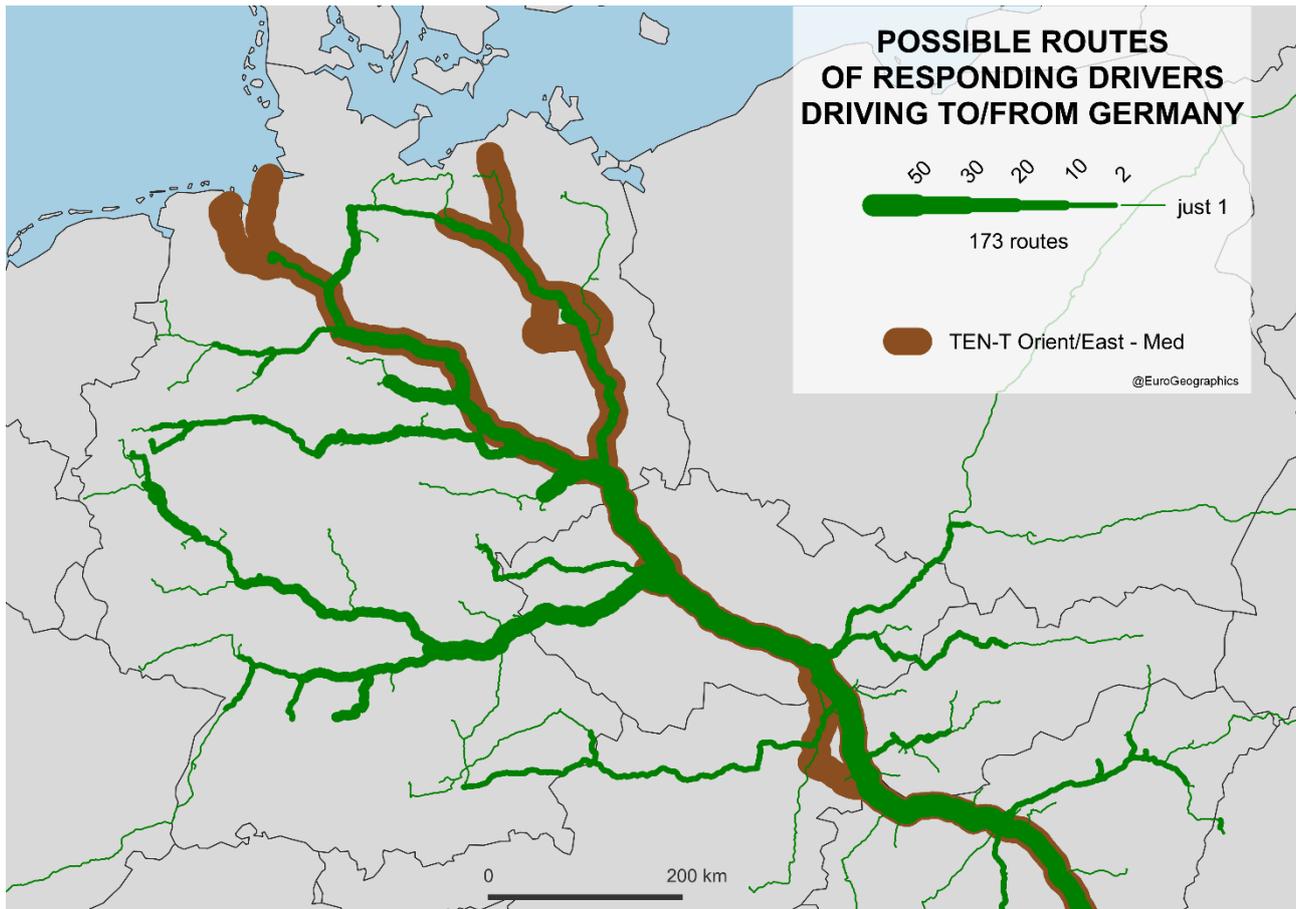


Figure 9: Illustration of origin and destination areas for truck traffic going to or from Germany.

### 3.2.7. Driving directions - Czech Republic

A closer comparison within the cities of the Czech Republic, from where or to where truck traffic flows are directed, is offered by the map below. It shows that the largest traffic flow is between Prague, Brno and Břeclav, from where trucks continue on to Bratislava. Then from Brno to Ostrava and on to Poland, from Prague to Pilsen, Karlovy Vary and Mladá Boleslav. It can be noticed that the traffic flows follow the route of the OEM corridor.

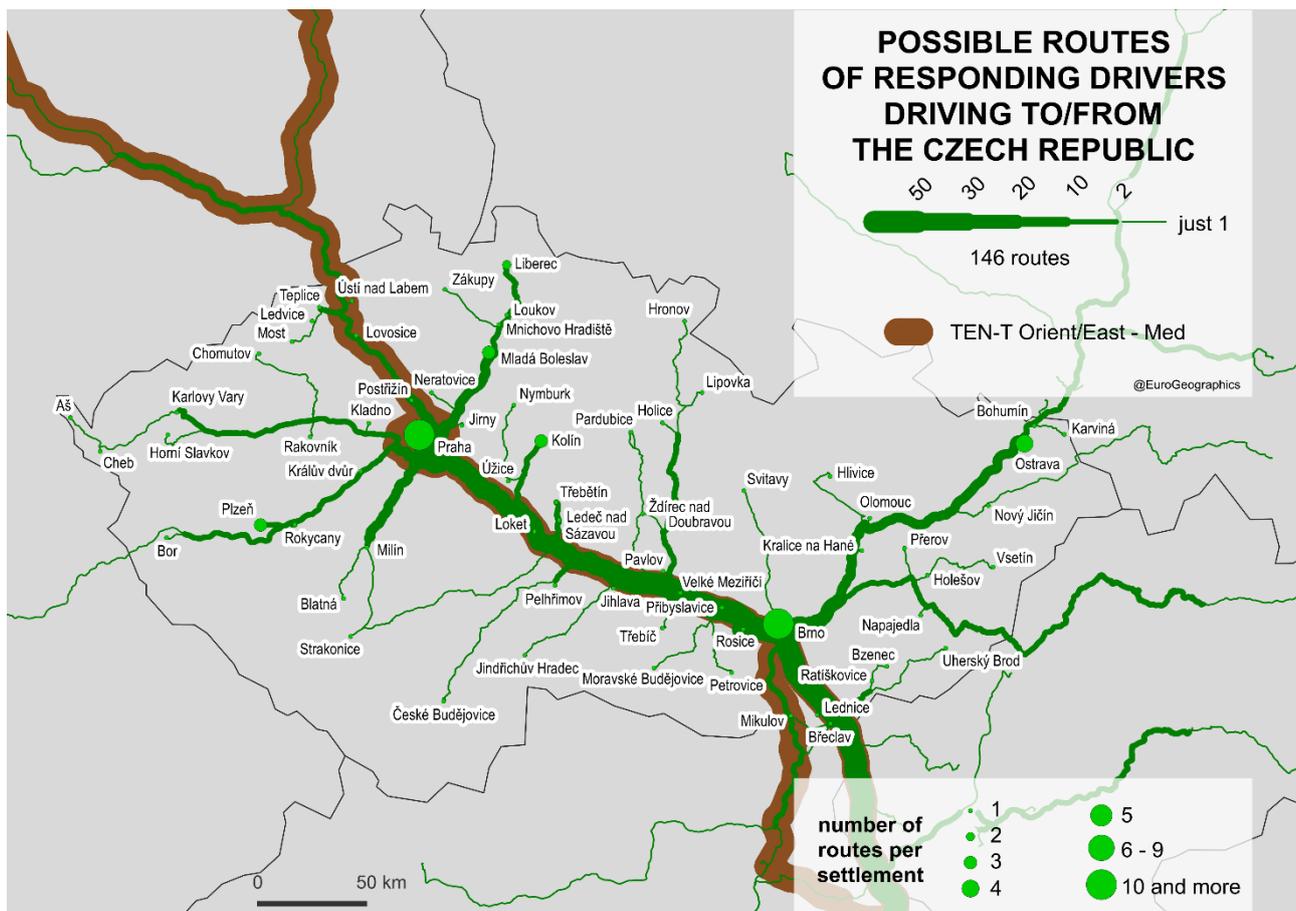


Figure 10: Representation of the cities in the Czech Republic where truck traffic is most often directed from or to.



### 3.3. Cargo transported

The characteristics of the type of cargo are important in assessing whether a commodity is suitable for transport by train. Drivers were therefore asked what type of freight they carry. Of the cargo identified, materials and raw materials (such as steel, glass, wood, building materials, plastics) account for the largest proportion. Automotive parts are second, followed by the cars themselves, foodstuffs, and end consumer products (e.g. electronics, textiles and footwear, toys). Perishable goods were represented by only a small percentage of respondents.

Table 3: Different types of cargo.

Type of cargo	absolute values	percentage
n/a	142	27 %
material, raw materials	120	22 %
car parts	56	10 %
food	37	7 %
automobiles	37	7 %
machinery and components	33	6 %
chemicals and pharmaceuticals	22	4 %
consumer products	21	4 %
furniture	17	3 %
empty	17	3 %
fruit and vegetables	11	2 %
shipments	11	2 %
cattle and meat	8	1 %
other	4	1 %

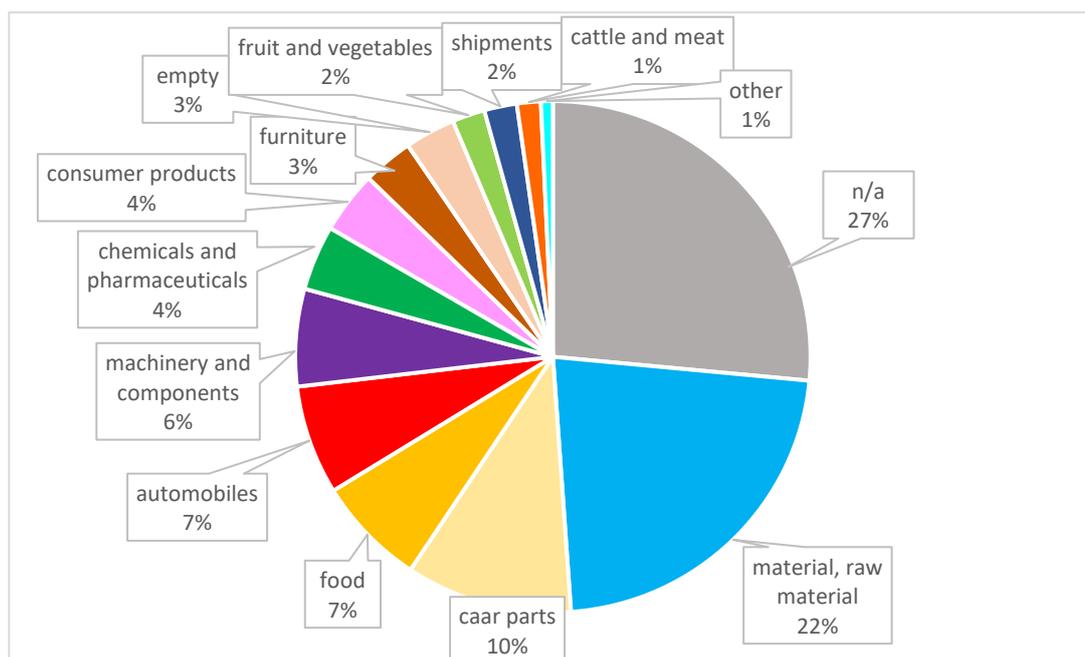


Figure 11: Share of each type of cost.



### 3.4. Cargo on the return journey

We also asked for information about the cargo that drivers will carry on the return journey. It was found that more than half of the drivers interviewed (278 to be precise) will carry some cargo on the return journey. 53 drivers said they will not carry any cargo. 187 drivers responded that they did not yet have information regarding the load on the return journey. We further divided the sample into drivers who only pass through the Czech Republic and those who start or end their journey here, the values did not differ significantly from the whole sample.

Table 4: Number of trucks by load on the return journey.

	Total	passing through the Czech Republic	start or end in the Czech Republic
carry cargo	278	198	80
will go empty	53	33	20
do not know yet	187	147	40
n/a	18	16	2

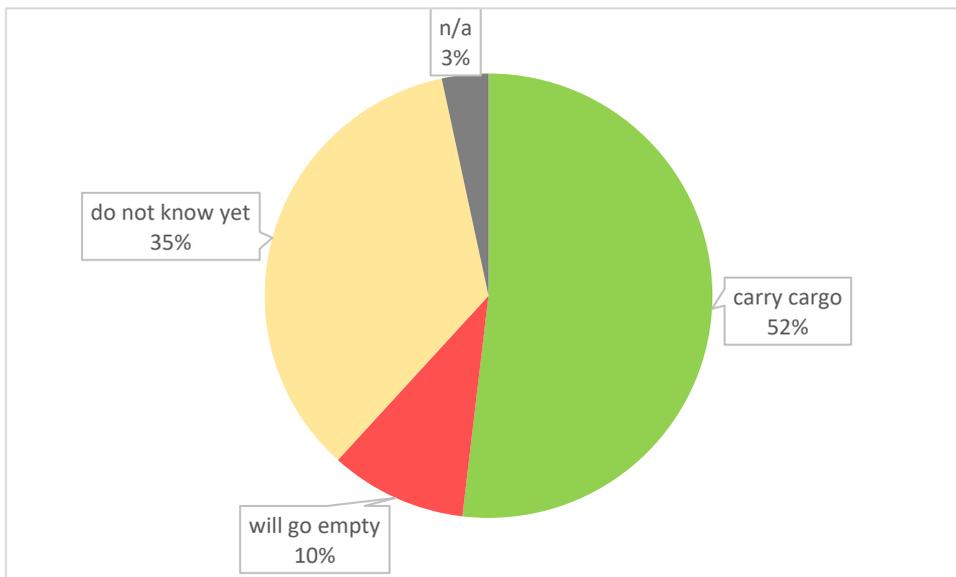


Figure 12: Cargo on the return journey.

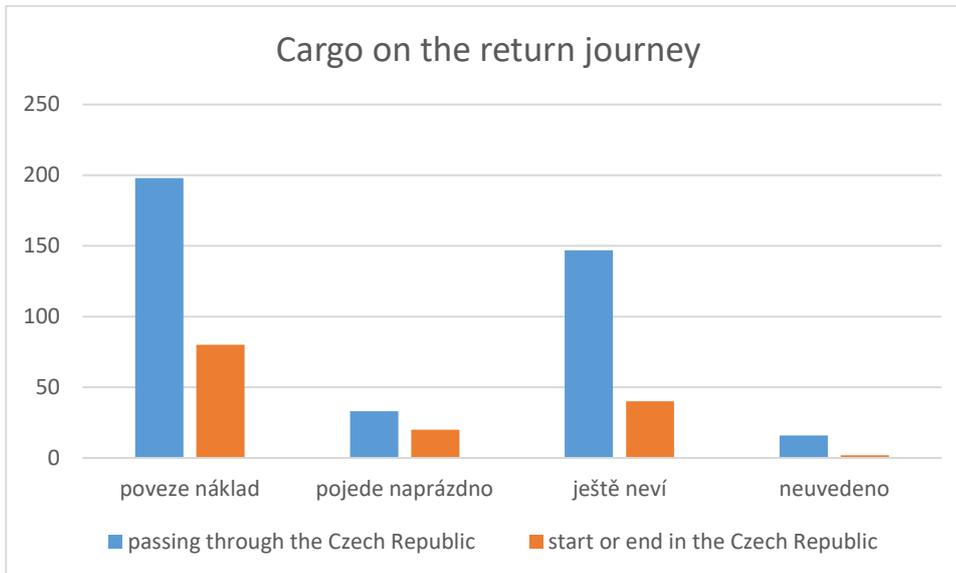


Figure 13: Cargo on the return journey taking into account drivers starting or ending in the Czech Republic.

### 3.5. Travel time

In the survey, we looked at how long it takes trucks to reach their unloading point. Drivers were asked about the date and time at the start of the journey from the loading point and the expected date and time of reaching the destination city. From the data collected, we calculated how long it would take drivers to complete their journey and constructed intervals.

The majority of respondents spent 1-2 days on the road, while the second group consisted of drivers who arrive at their destination in less than a day at the same time as those who take 2-3 days. Subsequently, the numbers of drivers decrease as the travel time increases.

Table 5: Distribution of respondents by cargo on the return journey.

length of journey	number	percentage
less than 1 day	83	22 %
1-2 days	112	30 %
2-3 days	83	22 %
3-4 days	33	9 %
4-5 days	25	7 %
5-6 days	14	4 %
6-7 days	7	2 %
7-8 days	4	1 %
8 and more	8	2 %

Note: the 1-2 day category includes drivers who spend a day or less on the road, the 2-3 day category includes drivers who spend 2 days or less on the road, etc.

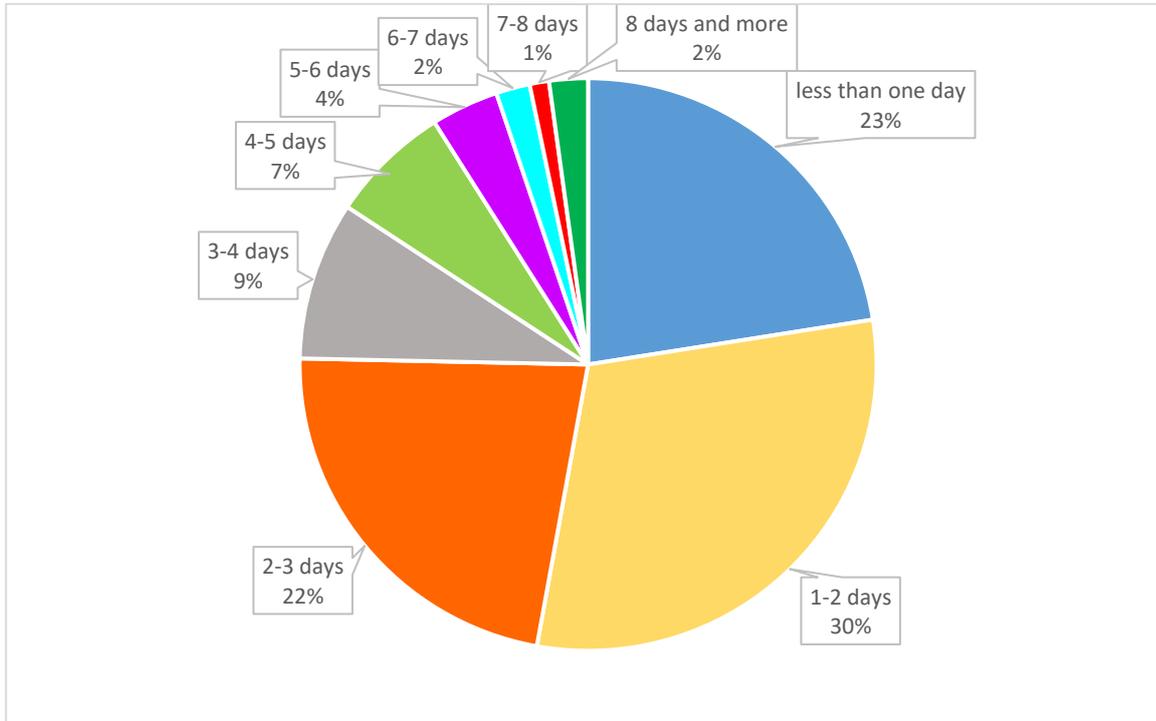


Figure 14: Time in days that drivers spend on their journey.

### 3.6. Number of nights on the road

The results from this area were fairly even. Drivers were most likely to spend one night on their journey with an overnight stay, the same with more than 3 overnight stays, the next in order was 2 overnight stays, followed by no overnight stays and the least number of drivers spent 3 nights on their journey.

Table 6: Number of overnight stays during the trip.

Number of overnight stays	Total	Percentage representation
0	46	9 %
1	134	25 %
2	116	22 %
3	97	18 %
more	134	25 %
n/a	9	2 %

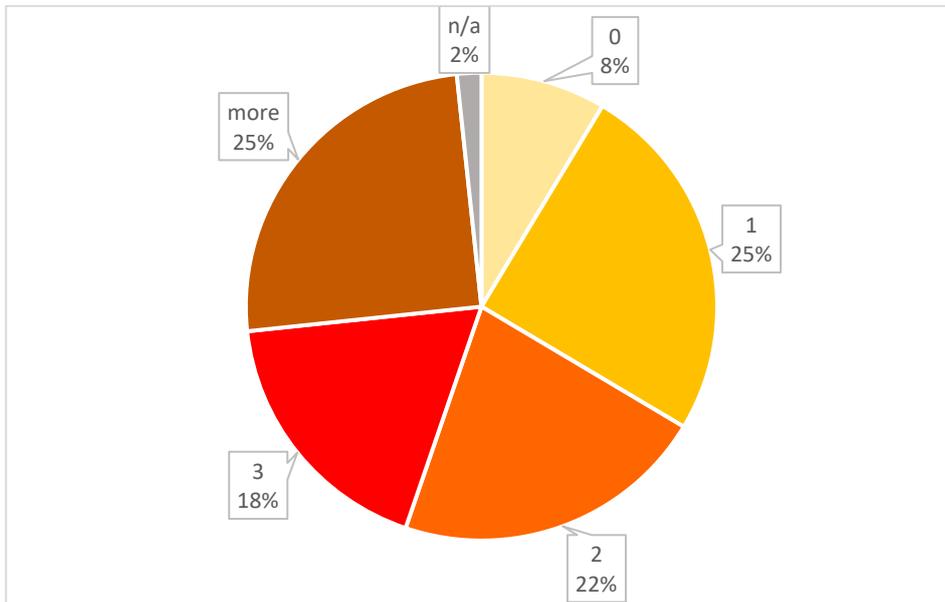


Figure 15: Number of overnight stays en route.

## 4. Conclusion

The survey confirmed that the proposed methodology is functional and that it can be used to identify important information that is not available from conventional sources. From the obtained data we analysed the busiest route Břeclav-Prague, which is used by freight drivers when crossing the territory of the region. The research clearly confirmed the strong demand for the TEN-T corridor route in the direction from the Balkans to Northern Germany and partly to Western Europe (Nuremberg and Stuttgart). The most frequent source or destination countries were Germany, Hungary, Romania and Slovakia. The vehicles do not have a single destination in the Czech Republic, i.e. no significant transshipment point was detected.

Of the surveyed cargo transported by drivers, materials and raw materials (22%), car parts (10%), cars and food (7%) are the most represented. In terms of return freight, more than half of the respondents also carry some freight on the return journey. Drivers were most likely to spend one to two days on the journey (30%), with the second most common group being drivers who made the journey in less than one day, along with those who arrived at the loading point in two to three days (22%). Drivers were most likely to stay overnight once during the trip, along with drivers with more than 3 overnight stays (25%).

The results of the survey will then be used in a quantitative analysis prepared by Masaryk University based on data from toll gates.