Interreg CENTRAL EUROPE
European Union European Regional Development Fund

TRANS TRITIA

D.T3.1.1 Report **3.2018**

Methodology of development of traffic surveys

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Content

1. Introduction

The TRANS TRITIA project is an international project covering the territory of 4 separate regions (NUTS 3) in 3 EU Member States:

- Moravian-Silesian region (CZ),
- Opole Voivodship (PL),
- Silesian Voivodship (PL),
- Žilina self-governing region (SK).

The project is focused on cross-border, transnational and interregional cooperation which will result in the increase of economic and social cohesion in order to achieve the objectives defined in the Europe 2020 Strategy or the EU White Paper on Transport. The main task of the project is to improve coordination at the level of strategic planning aimed at the development of infrastructure in the regions, which will result in the removing of bottlenecks in major international transit areas. One of the most important elements of the project is the elaboration of the strategy (action plan of implementation) of multimodal freight transport realized in the monitored regions. The main tool for verifying the proposed measures will be the processing of a cross-border multi-modal model that describes the state and development of freight transport.

The main role of the prepared model is to describe the current state of road, rail and inland waterway transport in the area of border regions and the prognosis of its development by 2030, with the utmost precision. The transport model, in addition to traffic relations in the project area, should also take into account wider traffic relations beyond the boundaries of the interest area. With regard to the industrial focus of the TRITIA area with intensive mutual traffic relations, these regions also form part of the Baltic-Adriatic Corridor (N-S) and the Rhine-Danube Corridor (W-E) with a significant share of international transit. Identification and quantification of significant traffic flows in the interest area of TRITIA region for internal and transit freight transport raises high demands on input traffic-engineering data in connection with the creation and calibration of the transport model.

The main inputs of the transport model are general socio-demographic data (e.g. demography, GDP, export, import, etc.), data of goods flows (transport performance of individual modes of transport, quantity of goods transported, etc.) and data from transport surveys for refinement and calibration of traffic model of the interest area.

In terms of contents of this methodological guideline, the data base of the transport model is defined as follows:

Data enabling quantification of demand for transport and loading of transport infrastructure in the relevant interest area from existing available resources. These are datasets that are the subject of routine statistical surveys, traffic data from current Census, and recording and monitoring systems on the road network. The collection, processing and evaluation of this type of data is not the subject of this methodological guideline.

Data from scheduled traffic surveys to obtain relevant and unified data sets for the processing and calibration of the traffic model of the interest area. The subject of this methodology is the guidelines for the performance and evaluation of the following types of traffic surveys considered appropriate in the light of the above requirements:

- The questionnaire traffic survey on border crossings,
- The profile traffic survey on identified road infrastructure profiles,
- The transport demand survey between major operators of freight transport and production organizations.

In case of the railway and inland waterway transport, available statistical data will be used mainly. The results of the questionnaire survey between freight forwarders will be used as additional data.

In terms of the territorial extent of the transport model, the traffic relations of freight transport over the geographical boundaries of the territory of TRITIA are analysed. In order to simplify the identification of origin and destination areas of freight transport, as well as mapping of transit within the TRITIA core territory, the model territory was divided into zones and major transport nodes. The area zoning problem is defined in Chapter 2.1.1 of this methodology.

The TRANS TRITIA project will deal with freight transport. Freight transport can be broadly divided into international transit, interregional transit and regional transport.

For the model itself, mainly international transit of freight transport will be interesting, where it is assumed that it could also be performed by other means of transport than road freight transport. The load on the road network by freight traffic shall be determined from available statistical survey data for freight transport and shall be specified according to outputs from national censuses and traffic flow monitoring systems. In order to calibrate general traffic relations within a transport model, passenger and light freight will be surveyed from the results of national census or from the outputs of automated recording devices on the road network.

The quantification of road freight traffic relations, which is the basis for identifying the modal shift potential and the calibration and validation of the transport model, will be carried out in accordance with the framework characteristics of these types of traffic surveys:

Questionnaire traffic survey

Main traffic survey, based on the results of which will be determined the most important traffic relations within the concerned area. It will be carried out at road border crossings between the separate countries of the TRITIA region. Border crossings will be selected based on the identification of significant international transit flows of road freight transport. The subject of the questionnaire survey will not be border crossings, where freight transport is forbidden, or it is marginal in terms of wider transport links.

In terms of traffic flow, the survey will focus on heavy goods vehicles, trailers of medium and heavy goods vehicles and on semi-trailer units, which have the greatest potential from the point of view of international transit freight. For the remaining categories of goods vehicles (medium goods vehicles and light commercial vehicles), there is only a marginal potential for relocating the load to another mode of transport, also because of the low potential for international transit, which is why they are not subject of the questionnaire traffic survey.

The results of the questionnaire traffic survey will specify the identification of main road traffic flows on the model network, for which the relevant sites for the profile traffic survey will be identified subsequently.

Profile traffic survey

The purpose of the profile traffic survey will be to verify the modelling of the road network load on major routes of cross-border and transit freight transport, which will be identified from the results of the questionnaire traffic survey and from the previous analysis of the available statistical data.

The survey will be conducted on a one-off basis, using automatic traffic counters able to continuously record the number of vehicles in traffic flow for at least 7 days. In the case of significant influence of the survey outputs due to traffic restriction or other anomalies, the profile traffic survey shall be repeated in another appropriate time. Used recording equipment should be able to distinguish the required traffic flow pattern based on the recorded vehicle length or other selection method. The methodology used to determine the composition of the traffic flow with the emphasis on identifying the interesting groups of the goods vehicles shall be specified by the working team in the presentation of the survey outputs.

Transport demand survey

The transport demand survey is complementary to the questionnaire traffic survey and will serve to supplement the input data into the transport model. Compared to the traffic surveys mentioned above, the scope of the survey are information on the extent and direction of traffic flows in all transport modes.

The survey will be carried out in the form of feedback on the sent questionnaires, which will be addressed mainly to operators of freight transport and large manufacturing companies (an important origin / destination of freight transport) operating in the TRITIA region. The questionnaires will relate to general information, such as the type of goods to be transported, the mode of transport used, the quantity of goods transported, the origin and destination of the transport, the regularity of the trips during the calendar year.

A schematic presentation of the interconnections between individual data inputs and their use in the transport model creation is shown below.

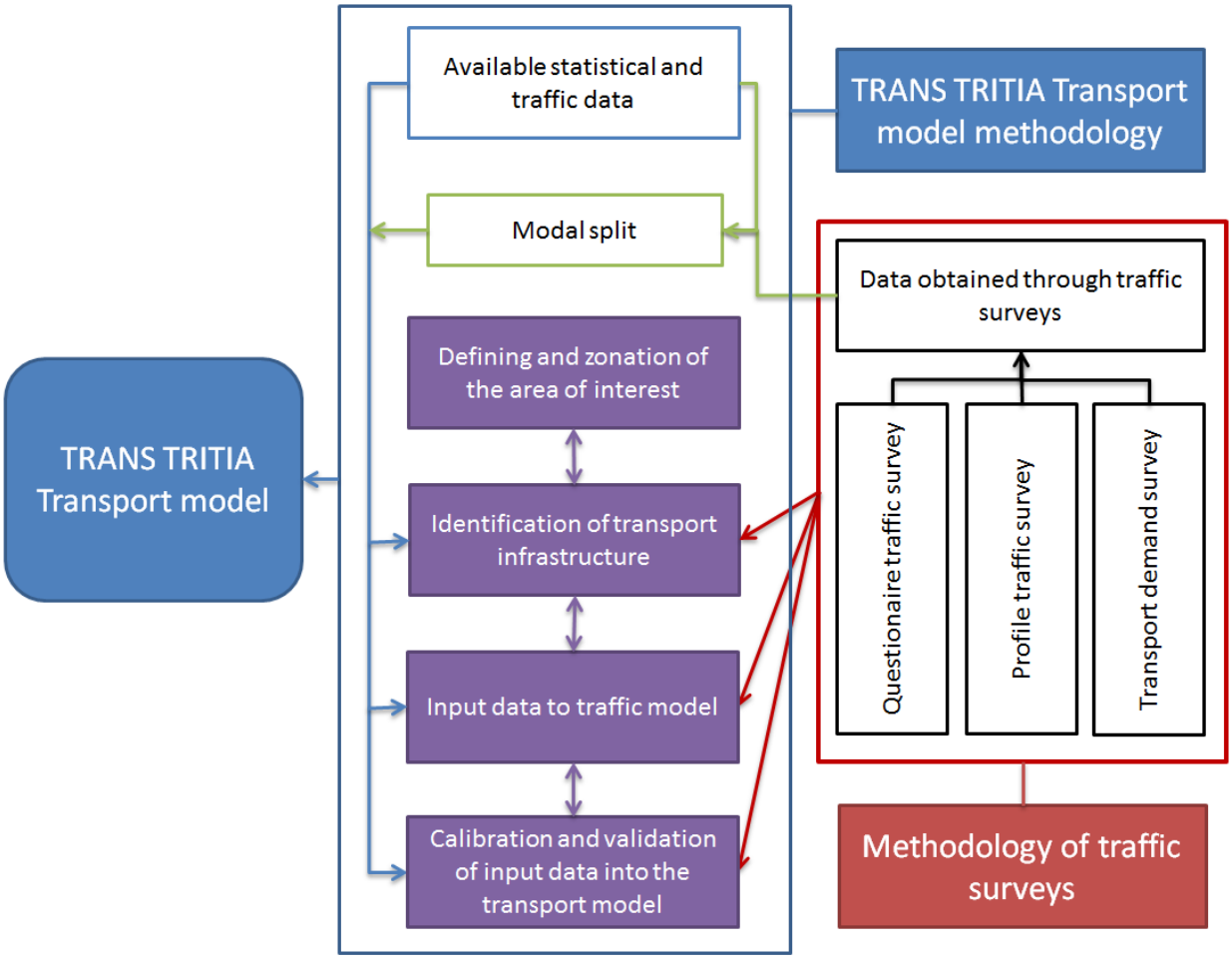

Figure 1 Structure and purpose of the data base for the TRITIA transport model creation

2. Methodology of performance and evaluation of traffic surveys

The chosen typology of traffic surveys and their outputs allows to define the distribution of transport performance between modes of transport (modal split) within the transport model and its calibration in terms of the load on the transport infrastructure and the direction of traffic flows on it. For the purpose of obtaining consistent datasets from all project partners involved in the collection and processing of data, the framework requirements for performance and assessment of each type of traffic survey are set out in this chapter.

2.1. The questionnaire traffic survey on border crossings (SK-CZ, CZ-PL, SK-PL)

The questionnaire traffic survey at the border crossing can be considered as a short-term traffic survey with the direct participation of truck drivers. Its purpose is to understand the patterns of relocation of goods on transport infrastructure in a certain territory, in this case the TRITIA regions. Movement on road infrastructure is primarily defined by the origin and destination of the transport. For the needs of the TRANS TRITIA project, it is necessary to know the complete route along the road network between origin and destination of transport. For this reason, a questionnaire traffic survey at the border crossings will be carried out:

- Origin and destination survey,
- Survey of traffic management.

The survey of origins and destinations of transport is based on the identification of the actual origin and destination of the journey (or other characteristics) that can be obtained directly from drivers during polling at border crossings. Outputs of the survey of origins and destinations of automobile transport are the matrices of origins and destinations (O-D matrices), which are an important input in the process of development and calibrating the four-stage transport model. The transport model calibrated by these outputs can then be used to quantify the potential for moving road freight transport to another mode of transport.

In addition to the identification of the origin and the destination of the transport, the questionnaire will also include the identification of the exact route used by the driver within the monitored area. This intention is achieved by defining a set of transition nodes on the road network and recording their time sequence passing directly from the drivers in the survey. As part of the data process, the routes will be retraced for each documented journey. Identified roads that were most often used by truck drivers will form the main network used by long-distance transit of freight transport.

The target group of questionnaire traffic survey will be goods vehicles in this classification:

- medium goods vehicles with trailer,
- heavy goods vehicles,
- heavy goods vehicles with trailer,
- articulated vehicle (road tractor with semi-trailer).

These categories of vehicles have the highest potential for their cargo to be transported in other modes of transport than road transport.

During the execution of this type of survey, drivers are required to respond in terms of the start and end of their journeys, the route used as well as the information that related to the frequency of these journeys.

Typical for this type of survey is the need for stopping vehicles, that interfering with the flow of road traffic. In the case in question, the vehicle is stopped at site in co-operation with police officers, and trained investigators perform queries and record responses to the questionnaire at the same time.

The activities necessary for the performance of the questionnaire traffic survey can be divided into the following phases:

- preparation (scope definition, organizational and technical support),
- performance (quality data requirements, control),
- processing and valuation (analysis and processing of gross data).

One of the basic steps of the preparation of the traffic survey is to determine the date of its implementation. Performinance of a manual short-term survey is recommended during April, May, June, September, or October during the normal working day of the week (Tuesday, Wednesday, Thursday), because the values of traffic volumes at that time are close to the annual averages of daily traffic (AADT) volumes. When determining the exact date of the survey, it is necessary to take into account the planned extraordinary events (cultural and sports events, extensive reconstruction of communications near the survey sites, etc.) that can affect the traffic volume. In such cases, another implementation date of survey should be set.

The questionnaire traffic survey will be performed twice in total, one of the measurements being predicted during the spring months and the other in the autumn months. It will be implemented at selected border crossings between the TRITIA region countries, that are used by long distance freight transport.

The purpose of the questionnaire traffic survey at border crossing points is to find out the direction of traffic flows of road freight transport in the monitored territory of the TRITIA region by identifying:

- origin and destination of traffic in the region,
- transit between regions and countries,
- long-distance transit through the monitored area.

Performance of the questionnaire traffic survey for the direct calculation of the AADT matrix is unrealistic due to both the time and the feasibility itself. For this reason, a short-term traffic survey is performed for 12 hours within a set time on selective sample. The short-term traffic survey is based on the generalization of traffic patterns through a sample that is recorded as part of its implementation. During execution of traffic survey, are attempting to obtain data from the largest sample of the traffic flow for the purposes of subsequent evaluation - generalizes the characteristics of the selective sample to the whole base set. However, in the case of high-traffic road sections, it is necessary to take into account the feasibility of the survey itself and to minimize the impact on traffic flow fluency. This also corresponds to the definition of the scope of personnel capacities for the survey.

2.1.1. Preparation of the questionnaire traffic survey on border crossings

Due to the nature and purpose of the questionnaire traffic survey at the border crossings (finding current traffic relations in the area concerned), the preparation of the survey can be broken down into the following steps:

- zoning of the interest area,
- determination of counting sites (border crossings),
- preparation of tally sheet (questionnaire),
- staffing of the survey,
- technical-material provision of the survey.

The term "interest area" means the area, within which the traffic relations, origins and destinations of transport between the different transport zones, as well as the traffic relations between this area and the external territory are considered. Survey data will also be obtained for the route used by the driver in the interest area. Given that there is a relatively dense communication network between different regions, there is a need to choose a network of transition nodes at major intersections of communications. These data allow more relevant assessment of the attractiveness of each alternative route.

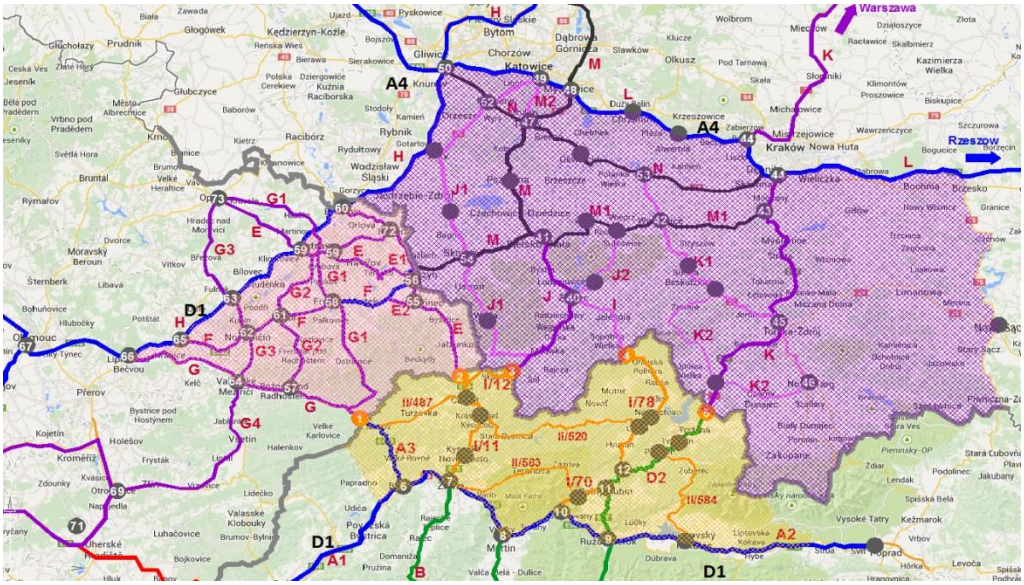

Figure 2 Example of definition of boundaries of the interest area with individual zones and transition points

The boundaries of the interest area are an imaginary line formed by the administrative boundaries of the Moravian-Silesian region, the Opole and Silesian voivodships, and the Zilina self-governing region, taking into account the border mismatch between individual regions and countries. The rule is that traffic relations within the interest area are analysed in more detail than traffic relations beyond the territory.

Interest area is usually an area with inhomogeneous distribution of the degree of land using and socio-economic characteristics. These disproportions have a negative impact on the relevance of transport modelling outputs in determining traffic demand. In order to eliminate these disproportions, the interest area, after its definition, will be divided into smaller areas - zones that have relatively homogeneous characteristics of the analysed traffic relations. The zoning process of the interest area also makes it possible to determine the regularity of traffic relations in the area to a greater degree of detail, which is considered desirable in the case of settlement units. In the case of more complicated traffic relations in the zones, it is appropriate to carry out their subsequent distribution to smaller parts – districts that would allow to characterize the relevant territorial unit in a more reliable manner. The extent of zoning significantly influences the variation in traffic relations that are decisive in surveys of directions of transport and the subsequent definition of the origins and destinations of traffic called OD matrices.

One of the possibilities of establishing the transport zones within the interest area is their definition based on the administrative breakdown of countries according to the Nomenclature of Territorial Statistical Units (NUTS - established by the Statistical Office of the European Commission) as follows:

- NUTS I: countries of Europe, in case it is necessary to obtain information about traffic relations within a wide area,
- NUTS II: area (the main regions for the application of regional policies),
- NUTS III: regions (in SK and CZ), voivodships (in PL),
- LAU 1 (until 2002 NUTS IV): districts (in the conditions of the SK),

- LAU 2 (up to 2002 NUTS V): municipalities.

The definition of the boundaries of the transport zones, and therefore their size, is affected by the purpose of the traffic survey. For this reason, it is not necessary to set the boundaries of transport zones (districts) only in terms of one level of NUTS statistical units, but perhaps their mutual combination. However, it is advisable to maintain the principle of a more detailed breakdown of the interest area compared to the territory outside it.

During the questionnaire traffic survey, relations between the external territory and the area of interest (origin, destination and transit traffic with respect to the interest area) are also recorded. Therefore, it is necessary to define the division of the territory into the transport zones outside the interest area (the external territory). The detail of the division of this territory depends on the required accuracy of the results of the survey and can be done on the basis of the administrative division (similarly as in the case of field surveys). With increasing distances from the surveyed area, the transport zones are represented by the higher level of the territorial unit. In this case, it is also possible to merge some countries (NUTS I statistical units corresponding to historical or geographical contexts) into one territorial unit (e.g. the British Isles, the former Soviet Union, the former Yugoslavia, Scandinavia, Benelux and the Iberian Peninsula).

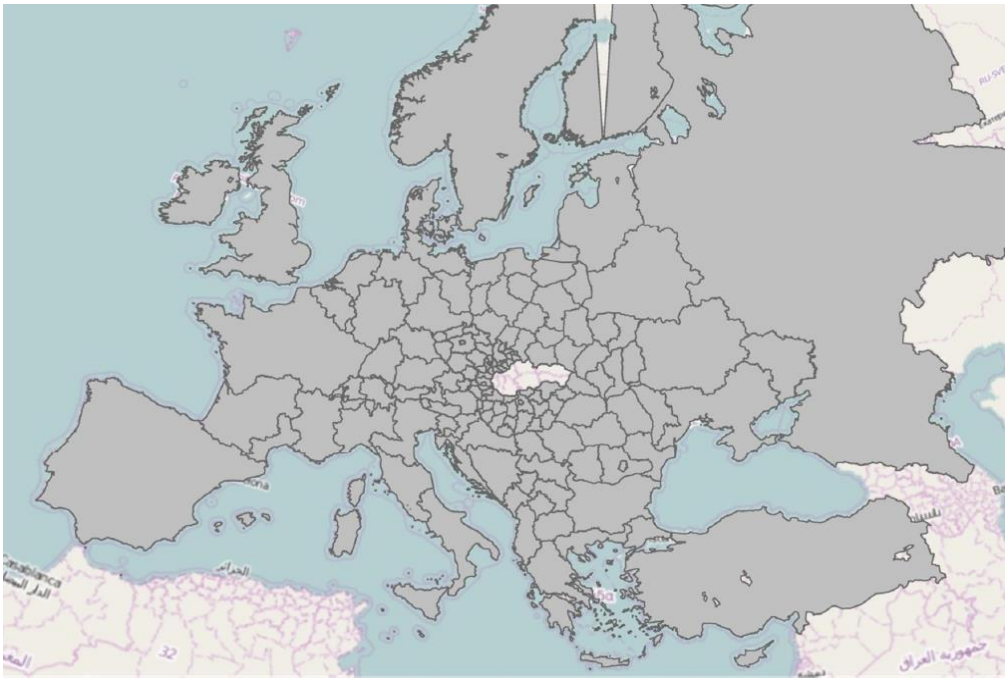

Figure 3 Example of zoning of the external area for the purpose of a traffic survey

For the implementation of the questionnaire traffic survey at the border crossings, the following division is recommended:

- Europe (except SK, PL, CZ) - NUTS I division,
- Slovakia - NUTS III division:
  - Žilina self-governing region – LAU 1 division,
- Czech republic - NUTS III division:
  - Moravian-Silesian region – LAU 1 division,
- Poland - NUTS II division:
  - Silesian voivodeship - NUTS III division,
  - Opole voivodeship - NUTS III division.

Each of the transport zones is represented by the centre of gravity (centroid), which represents the point projection of traffic relations for the entire zone. For the transport center of larger territorial units (NUTS III, LAU 1 level), district towns can be considered because of the existence of these settlements as the natural centers of the regions, as well as their direct connection to important transport infrastructure.

In order to simplify the recording of origins and destinations of transport in the questionnaire and the subsequent digitization of data, it is necessary to record the information in coded form. Zones, districs and nodes are assigned the appropriate designation (code) that will serve as the primary qualifying character. An important part of the encoding is the coding key, which allows faster processing of individual records during querying and then decoding the information back. In order to record the origin and destination of the transport, the codes (numerical or alphanumeric characters) assigned to transport zones (centroids) have been used to the different transport zones inside or outside the investigated territory as the coding key.

For the recording of the journey in the direction survey, it is necessary to develop a separate coding, in which the transport journey within the interest area is recorded in a simplified form. For this purpose, all significant intersections and / or locations, where the direction of the journey can change, are marked with codes. The number of these points is dependent on the size of the interest area and the density of the transport infrastructure. However, a higher number of labeled places will provide a more detailed indication of the direction of the journey with regard to the possibility of using alternative routes. The recording of the journey of transport to the questionnaire shall be made by entering the relevant codes in the order, in which the driver traveled. For the purpose of recording a transport journey, it is necessary to develop a map of the interest area with the identification of the individual codes.

The precise identification of the boundaries of the aream of interest, the definition of the transport zones inside and outside the interest area, their designation and the coding key will be clearly elaborated within the separate output of D.T3.1.2 (Preparation and execution of traffic surveys). The coding key will also be used during the questionnaire traffic survey at the border crossings itself by the investigators.

Counting sites in during the traffic survey will be border crossings within the interest area. An important role for the project partners is the preparation of a list of survey sites, (border crossings) at which the questionnaire traffic survey will be conducted.

The identification of the appropriate border crossing points for conducting the questionnaire traffic survey will be guided by one main principle, namely:

- localization of a border crossing on the road that is significant in terms of international transit for freight transport.

After identifying the appropriate border crossings, for the performance of questionnaire traffic survey it is necessary:

- to locate a place for polling in both directions,
- to take into account sufficient space capacity in relation to the expected traffic volume,
- to take account of the safety requirements of investigators during the execution of the survey,
- to take into account the requirement to maintain the safety and fluency of traffic flow.

In order to locate the exact location for survey, counting sites require physical inspection of the identified places to take account of the stated principles, and its exact location is required directly at, or close to, the boundary area (if space capacity does not allow). In the case of complementary surveys conducted during a questionnaire traffic survey, for example, profile traffic survey, it is necessary that their counting sites are on the same cross-sectional area. This allows the recording of the same intensity and composition of the traffic flow for both types of surveys, which is essential especially in the process of evaluating recorded data. It is necessary to place survey sites in the right place also in terms of the availability of the

technical staff and the personnel collecting the data. Transport of workers to work is one of the factors to be addressed in preparation for the survey.

For the purposes of vehicle decommissioning in a questionnaire traffic survey, the counting site is usually the choice of a tidy, sufficiently spacious surface that ensures trouble-free parking of vehicles in a number that will meet the needs and scale of the survey. Appropriate places shall in particular be considered:

- landing and pumping stations,
- associated driving belts;
- parking and parking spaces;
- border crossings;
- parallel communications with a direct connection to the road of interest.

In order to fulfill the purpose of the questionnaire traffic survey at border crossing points, it is essential to ensure cooperation with all stakeholders. In this case, this means the coordination of the individual steps during the preparation of the survey in the form of formalities that define the procedure for approving the necessary documentation and the authorization process.

The performance of the questionnaire traffic survey is subject to its approval and authorization by the responsible entities whose cooperation is essential in carrying out this type of traffic surveys. Given the different legislative conditions, the management and ownership of roads and other conditions in individual countries, the process of the permitting process will be dealt with individually by each project partner. For this reason, it is necessary for project partners to identify their national rules on the authorization process for the performance of the questionnaire traffic survey at border crossing points.

The authorization process should be carried out in each of the countries concerned according to the following general principles:

- Request the conditions from the appropriate road authority to allow a survey to be carried out at the border crossing points,
- Develop a temporary traffic sign project on individual counting sites according to relevant national legislation and technical standards,
- The design of the temporary traffic sign project and the performance of the questionnaire traffic survey must be expressed by the relevant traffic inspectorate and the road traffic controller according to the location and importance of the communication on which the survey will be conducted,
- It is essential for all subjects to be aware of the progress of the preparation, implementation and actual objective of the survey,

Since the questionnaire traffic survey is carried out by stopping the vehicles directly in traffic and then asking the drivers, it is necessary to carry out a survey in cooperation with the Police, who also supervise the course itself and the safety of the survey. For this reason, it is also necessary to send requests for assistance in carrying out a traffic survey to the relevant police department, or directly to the relevant traffic inspectorates

An important part of the preparation of the survey is the elaboration of a questionnaire. The questionnaire can be divided into two basic parts:

- general information,
- questionaire.

In the first part of the questionnaire, general information about the traffic survey are stated, that the relevant investigator states before using it for the purpose of writing the answers. This information serves to identify individual questionnaire and contain:

- place of realisation of traffic survey (name of border crossing point),
- date of realisation of traffic survey,
- survey hour - the time interval within which a vehicles is recorded on a single questionnaire,
- number of counting site,
- driving direction of the recorded vehicles,
- the name of the investigator,
- serial number of the questionnaire - this is particularly necessary in the case of achieving high traffic volume in the admissions opinion and the need to use multiple questionnaires during one time interval.

Some of the above information can be filled in before the survey execution to ensure a smooth run of the survey and reduce the time needed to fill the questionnaire.

In the second part of the questionnaire, all the information surveyed will be recorded during a questionnaire traffic survey at border crossings. Questions that are the subject of driver questioning reults from the nature and purpose of the survey, and it is recommended to apply at least the following structure of questions:

- Vehicle categories (depending on the purpose of the survey);
- Origin of transport (the transport zone represented by the centroid, from where the driver started his journey);
- Destination of transport (the transport zone represented by the centroid, where the driver ended his journey);
- The route of journey, which will represent the significant crossing points (codes) identified during the survey preparation:
- Frequency of transport (the number of journeys performed by a driver over a given time interval - it is also found whether it is a route of a scheduled or non-scheduled nature);

The wording of the questions must be worded in a meaningful way so as not to misinterpret and subsequently fill in the questionnaire sheet incorrectly. However, this is largely eliminated in the case of the oral question on communication, where a investigator can, in case of misunderstanding, clarify the question of the participant in the survey.

The second part of the questionnaire records the following:

- serial number of the recorded vehicle,
- an international abbreviation of country of origin of the recorded vehicle,
- the exact time of the vehicle stop (hh: mm),
- vehicle category,
- answers to the questionnaire traffic survey.

ORIGIN - DESTINATION SURVEY

CONTACT (place manager):

BORDER CROSSING:

NAME:

DATE:

TIME:

DIRECTION: COUNTING SITE:

SERIAL NUMBER OF QUESTIONNAIRE:

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QUESTION num.:		1		2	3	4			
s. num.	time	vehicle category		origin	destination	route - according to the coding key	frequency			
							scheduled		non-scheduled	
1	7:15	MGVT	~~HGV~~	C1	16	C2 - C7 - S1 - S3	5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				~~3-4 x W~~	<	2-5 x Y	> 10 x Y
2	10:22	MGVT	HGV	E1	E10	S3 - S1 - C2 - P1 - P3	5-7 x W	1-2 x W	1 x Y	~~6-10 x Y~~
		HGVT	~~ST~~				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y

Figure 4 Example of filling the questionnaire

Already when questionnaire is created, it is necessary to define the categorization of vehicles recorded in the course of the survey. The breakdown into individual vehicle categories is done on the basis of a visual evaluation by the investigator or by an interview with the driver. In particular, it is necessary to distinguish between 4 categories of motor vehicles as follows:

- medium goods vehicles with trailer (MGVT) - motor vehicles with a maximum total permissible mass exceeding 3,5 tonnes but not exceeding 12 tonnes with a trailer,
- heavy goods vehicles (HGV) - motor vehicles with a maximum total permissible mass exceeding 12 tonnes,
- heavy goods vehicles with trailer (HGVT) - motor vehicles with a maximum total permissible mass exceeding 12 tonnes with a trailer,
- articulated vehicle (AV) - road tractor with semi-trailer.

The questionnaire for the survey is in ANNEX 1

Other categories of vehicles will not be recorded during the survey, as they are unnecessary in view of the purpose of the TRANS TRITIA project. Their volumes can be determined from statistical data, from national census outputs, and from the outputs of permanent intelligent traffic flow recording systems. If necessary, it is also possible to use the results of short-term profile traffic surveys that will be carried out on selected road profile profiles within the project.

After completing of the design part of the traffic survey, it is necessary to ensure the necessary range of personnel capacities in the form of investigators and technical personnel as well as the technical equipment for carrying out the traffic survey.

The staffing of the survey is influenced by the scope of the survey. The scope is determined by the number of counting sites and the intensity of the vehicles to be stopped at the sites. The anticipated number of investigators is based on the expected traffic volume, which can be determined from the results of the last national census performed, possibly based on other available traffic surveys performed on / near a particular counting site.

The investigator executing a questionnaire survey on average inquire150-200 drivers for the duration of the survey within 12 hours. Vehicles under review account for approximately 20% of the total vehicle intensity at a particular counting site. The recommended sample of surveyed drivers at one location is between 500 and 1,500 depending on the profile intensity. Based on these initial assumptions, it is possible to simply deduce the necessary number of investigators per site.

The investigator requirements are formulated depending on the nature of the work they will perform. Because the survey is a kind of fieldwork in the form of recording vehicles of different categories, investigators should meet the following requirements:

- at least 18 years of age,
- good health (for reasons of personal safety, focusing in particular on sensuality due to the necessary ability to register moving vehicles with eyes and ears);
- knowledge related to distinguishing vehicle categories and filling in forms or questionnaires, handling with technical equipment
- elementary knowledge of the foreign language (if the survey is implemented at the border crossing there is a requirement for communication in a foreign language),
- care, reliability, independence, responsibility, communicability, working with people.

From the above-mentioned requirements, most important is the ability to recognize each category of goods vehicles.

All active participants in the planned traffic survey are required to undergo training (or training sessions) organized by the survey processor to provide all the necessary information necessary for the subject matter of their work.

In terms of content, it is recommended that the training will be divided into the following thematic blocks:

- General section: Participants of the traffic survey will be familiarized with general information, practical principles, subject and form of traffic survey. They also obtain knowledge about their allocation to the counting site and about their place manager. An important detail of the training is part about safety and health protection at work, from the reason of execution of traffic survey close to the road traffic.
- Expert section: This part may be under the responsibility of the place managers, who will start with active cooperation with participants by the way in behalf of quality of survey outputs. Objective part consists of:
    - Theoretical preparation: At this stage of the training, workers will get a detailed insight into the specific situation and their assignment to individual counting sites. In context with alternatively exploitation of technical equipment they will be trained to manipulation with equipment or about the method of filling the questionnaire (depending on the chosen methodology of survey). In brief, all the essential elements necessary for carrying out the traffic survey can be repeated.
    - Practical training: Practical demonstration should take place in an active form by presentation of manipulation with technical equipment in the training area at first and then directly in the road traffic. In practice, participants can test a simulated manual entry in the questionnaire under the supervision of the place manager.

The training organizer is required to actively engage the survey participants in the discussion and be prepared to answer all questions and comments about the survey and the nature of the performance of adder work. The training should be exhaustive so that it can be considered sufficient to successfully manage

the survey. It is recommended that the training also includes the distribution of the materials and tools needed for investigator performance.

The smooth running of the survey requires the provision of a sufficient amount of material to the investigators. Before the survey is conducted, the investigator is provided with:

- questionnaire (in sufficient quantity),
- maps of the monitored area divided into transport zones,
- writing tools,
- questionnaire questions in multiple language mutations,
- coding keys for recording origin, destination and route of the journey,
- A4 size hard pad,
- safety reflective vest,
- raincoat in case of bad weather,
- if necessary, enlightenment of the counting site.

In the event of unexpected situations, it is necessary to ensure that all material and technical equipment is in reserve or that it is delivered in a timely manner.

2.1.2. Execution of the questionnaire traffic survey on border crossings

Already in the process of preparation the survey, the processor has to deal with optimization of logistics and the distribution of personnel capacities needed to conduct the survey. The workers participating in the survey must be trained in advance and must have a sufficient number of substitutes, so that there is no risk of failure in the day itself.

The questionnaire traffic survey at all identified border crossings will be conducted as a 12-hour continuous data collection from 06:00 to 18:00 with the inclusion of daily peak hours. The survey should be carried out on one of the usual working days (Tuesday, Wednesday, Thursday) in a week without the occurrence of pre-known events that would adversely affect the recorded traffic volume sample (such as planned closures, cultural events, public holidays). For the optimal period of traffic survey is considered to be the months in which the traffic volume variation is close to annual average daily traffic (AADT). During the implementation of both surveys, a 7-day profile traffic survey will be carried out for purpose of conversion of the 12-hour intensity to weekly average daily traffic.

Prior to the questionnaire traffic survey execution, it is necessary to ensure that the portable traffic signs are placed on the traffic survey's position and, if necessary, the overlay of the permanent traffic signs is done on the day of the survey. The placement is performed by the survey processor or by the third party, based on the instructions of the survey processor. The selection of the required traffic signs under the Road Marking Project must respect the standards applied to traffic signs for a particular road category. Portable traffic signs are checked by a police officer.

Questionnaire traffic survey may only be performed by a person who is properly instructed to meet the requirements already defined. The investigator must be on the survey site in sufficient time advance, not later than 15 minutes before the survey begins, properly equipped according to the specified information (materials needed to perform the survey, clothes according the weather conditions, reflex vest). All survey sites (positions) must be covered by the designated number of investigators at the start of the survey.

The investigators arrive at the designated survey site, which is precisely marked, localised and defined by the set of detailed data (e.g. road number, direction, region, district and municipality, in a descriptive way

– e.g. junction, start / end of municipality, GPS coordinates). Last but not least, it is advisable to mark the position of the investigator on a map that she/he receives along with other necessary materials for questionnaire traffic survey. The transport of investigators to the survey sites may be secured on their own account or is provided by the survey processor directly or outsourced (e.g. the HR agency).

Questionnaire traffic survey will participate also the members of the Police. For this reason, it is necessary the cooperation and communicate between the traffic policemen, drivers and investigators at the survey site.

The work of the investigator within a survey is to ask questions to the driver and then to record his responses to the standardized form. The questions must be asked in a meaningful way so as not to misinterpret and subsequently fill in the questionnaire incorrectly. If an interviewed does not understand the subject of the survey, the investigator will explain it in the case of the oral question method. Also in the case of a survey in the form of a written questionnaire, if the questionnaires are returned immediately after they have been completed (e.g. survey carried out in the parking lot), the investigator may, in case of misunderstanding, clarify the question to the participant. Assuming that drivers of foreign vehicles are also participated in a survey, it is necessary to equip investigators with the translation of questions in foreign languages, preferably to all those which may occur on a larger scale (in particular the neighbouring countries' languages and English, Russian, and as expected of the transit routes may be Romanian, Serbian, Croatian).

When recording individual entries in the questionnaire, it is possible to shorten the time of driver`s restraint, when already before interviewing the driver the investigator serial number, the actual vehicle stop time, the international license plate number, the vehicle category based on the visual assessment. After stopping the vehicle the investigator records the occupancy of the vehicle (the number of persons in the vehicle). Subsequently she/he informs the driver about the realization and the purpose of the survey and asks the driver to answer the questionnaire. Particular emphasis is placed on issues determining the origin, destination and route of the carriage performed and their correct entry into the questionnaire.

Figure 5 Example of questionnaire traffic survey realisation

Upon completion of the questionnaire traffic survey, the investigator marks each filled form with a serial number and fills in all required data. Thereafter she/he completes all the questionnaires in the order in which they were recorded in the manual census and immediately handed them over to the authorised manager. After the records have been received, the authorized manager will check their completeness and verify the correctness of the entry. In case of discrepancies, the authorised manager asks directly the investigator to explain them.

After finishing the survey, it is necessary to remove portable traffic signs and uncover permanent traffic signs.

2.1.3. Processing and evaluation of the questionnaire traffic survey on border crossings

Information from the questionnaire traffic survey is given in the questionnaire and needs to be completed and put into digital form.

The completion of the sheets should include, on the part of the processor, a primary check of the completeness and logic of the data, for possible addition by the investigators. Emphasis is placed mainly on the correctness of filling in the identification data in the header so that the data can be unambiguously subsequently assigned to the relevant counting site. In terms of the subsequent evaluation, it is necessary to know clearly in which direction the vehicle runs over the given counting profile.

In the questionnaire traffic survey, the origin and destination of the journey are the data given by the driver about the location in the given zone where he started his journey and the intended place (zone) where he will end the journey.

The result of the questionnaire processing should be the electronic form of the working database of the outputs from the performed traffic survey. Prior to the analysis of these data, they must be cleansed. The data cleansing process consists of the detection and subsequent correction of a set of occurrences that show signs of error.

From the questionnaire traffic survey at the border crossings, we have information about the actual start, respectively the end of the journey and information about the route used by the driver. In the context of evaluation of the survey of origins and destinations, output is in the form of matrices of origins and destinations.

The matrix of traffic relations is a schematic representation of the number of journeys made on the traffic relations represented by a set of origins and destinations. In terms of the interest area, we know the following types of journeys (traffic relations):

- origin transport (the transport origin is located in the interest area and the transport destination is outside interest area);

- destination transport (the transport origin is outside the interest area and the transport destination is located in the interest area);
- transit transport (origin and destination of the transport are outside the interest area);
- inter-zonal transport (the origin and destination of the transport are in the interest area, each of these points being located in different transport zone);
- zonal transport (the origin and destination of the transport are in the interest area, both of which are located in the same transport zone).

The aforementioned traffic relations are schematically illustrated in the following figure.

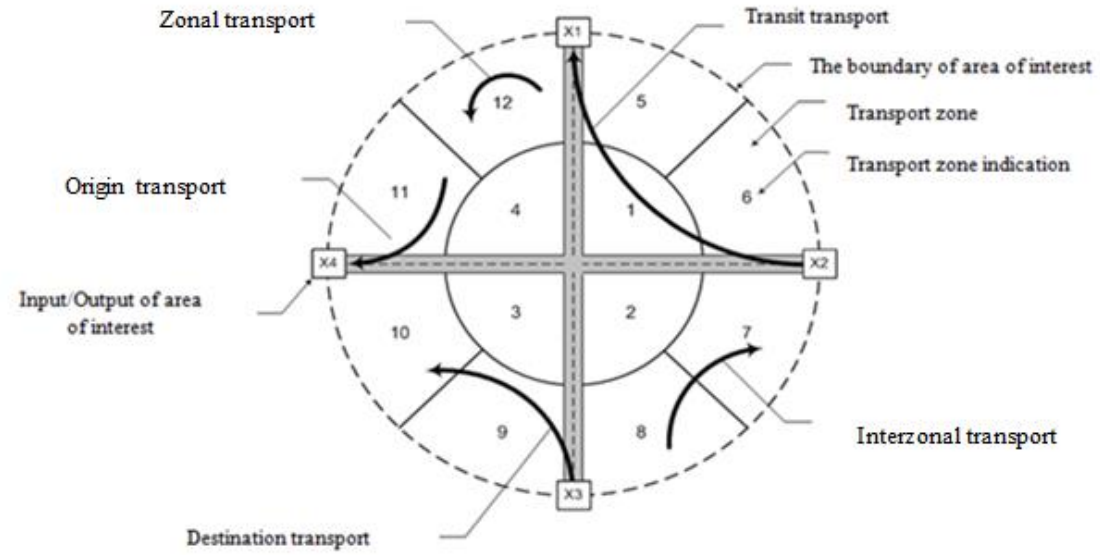


Figure 6 Schematic representation of traffic relations within the interest area

The above-mentioned types of roads are transformed into traffic matrices, which are one of the basic outputs of the traffic survey. The structure of the matrix of traffic relations itself is defined by the arrangement of its elements in the fields representing the different types of roads

The first step in creating a matrix of traffic relations is to create a primary matrix from the data recorded during the questionnaire traffic survey at the border crossings. The basis is a clean and disaggregated form of a work database containing all relevant records.

The values in primary matrices of traffic relations represent the number of successfully assigned relations based on the data obtained during survey performance. For the purpose of proper evaluation of the questionnaire traffic survey, it is necessary to modify the primary matrix of traffic relations in a form that corresponds to the real intensities on the counting sites - the basic statistical survey file. At the same time, it is necessary to recalculate the matrix for the commonly used values of traffic-engineering characteristics, such as annual average daily traffic (AADT) or peak hourly traffic volume. The determination of these traffic-engineering characteristics is conditional on the realization of profile traffic surveys to the level of minimum required vehicle categorization.

In order to determine traffic-engineering characteristics, the following values from the profile traffic survey data for each driving direction shall be determined separately and in the required traffic flow pattern:

- daily average traffic volume (24-hour and 7-day profile summation);
- weekly average traffic volume (7-day profile summation);

- or other characteristics depending on the purpose of the questionnaire traffic survey.

For the conversion of the basic directional matrix resulting from the data obtained during the survey to the values of the average 12 and 24 hour matrices or the weekly and annual average daily volumes, selected transport-engineering methods suitable for evaluation of short-term traffic surveys, or transformation of matrices to AADT level will be used.

Detailed procedure for evaluation of the questionnaire traffic survey and detailed procedure for the creation of traffic relations matrices will be clearly elaborated within the separate output of D.T3.1.2 (Preparation and execution of traffic surveys).

2.2. Profile traffic survey

The purpose of the profile traffic survey (traffic count) is to obtain traffic volume data in a defined traffic flow pattern on selected road profiles in both directions at once. According to the theory of traffic surveys, the traffic count can be executed manually or automatically, and it is possible to distinguish short-term counts (12 h, 24 h and 7 days) or long-term counts (365 days) over time.

When performing traffic counts for project TRANS TRITA, a minimum of 7 days of traffic count is expected. The result of this count is the creation of daily and weekly variations in traffic volumes in the required vehicle categorization, for specific count sites, that can be used to calculate traffic directions matrices to RPDI values.

It is recommended, that the profile traffic survey (PTS) will be carried out by mobile automatic traffic counters (ATC), because the operator is only needed when installing and uninstalling devices, and the data collection is fully automated. The time of PTS performed by mobile automatic traffic counters should be at least 7 consecutive days in order to capture the course of the hourly intensities during the entire days of the week resulting in variations in daytime intensities during the particular week of measurement.

The device should be installed at the count site with sufficient time, at least a day before the actual start of data collection. Uninstalling the device is done only after the measurement is completed, thus the day after the data collection is completed.

2.2.1. Preparation and performance of profile traffic survey

In the preparation of the profile traffic survey, the most important task is to identify suitable counting sites in the interest area.

When identifying the traffic sites of minimum a 7-day traffic survey it should be based on the following principles:

- Identify the road network relevant for the elaboration of traffic model of the interest area for project TRANS TRITIA (preferentially network of motorways, expressways and 1st class roads, which can be complemented by roads of lower categories leading to significant freight traffic sources and destinations).
- Identify the existence of sections with static monitoring devices for the continuous recording of traffic volumes (365 days) on the identified road network and verify the availability of the recorded data for project purposes.
- Profile traffic surveys will be performed only on sections where data from other automatic or intelligent systems are unavailable.
- Counting sites of the profile surveys should be located on the road sections representing the through-flow used by the long distance freight traffic vehicles resulting from the analysis of available

statistical data and from the results of the questionnaire traffic survey on border crossings, supplemented by the results of the questionnaire survey.

- It is assumed that the national traffic census has been performed on the relevant road network, which will be the next source for obtaining the necessary data. For PTS performance, only sections between intersections are selected, where verification data from the national census is needed, or where the national count has not been implemented.
- The section for PTS performance should be straight, unobstructed in the detection zone of the device.
- Before PTS performance itself, it is necessary to look at sites potentially suited for ATC mounting within predicted counting sections.
- During the whole duration of the survey, traffic constraints affecting the traffic volume, its hourly or daily traffic or the composition of the traffic flow (e.g. a temporary ban on vehicles over 7 tonnes) should not occur in the counting section and its surroundings. It is necessary to obtain information about implementation of scheduled road maintenance or repairs from the phase of getting permits from road managers and, on the basis of this information, appropriately to choose the traffic count time.

Figure 7 Example of placing automatic traffic counter for the traffic count

In sufficient time before PTS performance, it is necessary to ensure permits from the road managers on selected road sections for mounting of automatic traffic counters on the vertical traffic signs on the relevant roads for the entire duration of the traffic count.

Time synchronization of mobile ATC installed during PTS performance will be ensured by using the same portable computer from which the input data will be recorded to mobile ATC, when installing and calibrating them.

In order to ensure the reliability of the traffic count results and to minimize the impact of overlapping of vehicles using microwave detectors in bidirectional traffic on surveyed roads, it is recommended to use separate mobile ATC for each driving direction of the vehicle. The required number of detectors for the measurement is therefore equal to twice the number of counting sections. This principle also applies to roads with a greater number of lanes in some driving direction, but there is a risk of overlapping vehicles higher and its elimination is more problematic.

General requirements for automatic traffic counters used for seven days traffic counts:

- record of vehicle parameters:
    - date and time of the vehicle passage,
    - the length of the vehicle in decimetres,

  - current vehicle speed,
  - time gap from the previous vehicles in seconds,
  - vehicle driving direction
- battery life for more than 7 days of measurement
- memory capacity allowing for the storage of vehicle data in the estimated number of the annual average daily traffic (AADT) in the 7 days of traffic survey for the measured direction (in the case of directional distribution) or for both directions (2 lane roads)
- the ability to export data in a format supported by MS Windows

In profile traffic surveys, the short-term traffic count equipment using microwave detectors will be most frequently used, the basic requirements and the procedure for installing them are governed by the manual supplied with the devices.

In addition to the mobile ATCs themselves, the operator must also be equipped with a portable device (notebook, mobile phone, etc.) capable of wireless communication with the ATC. In most cases, Bluetooth technology of different versions is used to transfer data according to the technical specification of the used mobile ATC, which allows to upload the default information and settings to the device and to download the measured data after the measurement has been completed. Other requirements for a portable device in the form of a minimum memory size, operating system and etc. are dependent on the specific type of mobile ATC.

2.2.2. Evaluation of profile traffic survey

Traffic count will result in profile volumes on selected road sections in 24 hours and 7 days (WADT – weekly average daily traffic) according to defined vehicle categories. As the traffic model input data will be on an annual basis, all results of short-term traffic counts need to be converted to the annual average daily traffic (AADT).

The calculation of WADT to AADT is made according to the conversion factors of specific national methodologies for the calculation of short-term traffic surveys to annual values.

The procedure for calculating the AADT from the survey data is dependent on the details and structure of the conversion factors, which may take into account, for example, type of road, region, vehicle category, traffic survey date, etc.

In sections where continual annual data of traffic development volumes are available (e.g. an automatic traffic counter directly in road), it is possible to calculate the average annual intensity directly from the database without using the conversion factors.

In the case of short-term traffic counts carried out by mobile automatic traffic counters, vehicle categorization shall be assessed on the basis of the length of the vehicle passing through the device sensor. For each device placement and setting, it is necessary to check the recorded length of vehicles based on which vehicle categorization is processed in the evaluation of the survey.

- light traffic:
  - passenger cars (most frequent up to 5.5 m),
  - light commercial vehicles up to 3.5 t (most frequent 5.5 – 8 m),
- heavy traffic:
  - medium goods vehicles 3.5 - 12 t (most frequent 7 - 12 m),
  - heavy goods vehicle more than 12 t (most frequent 9 – 12 m),

- a combination of vehicles and trailers or semi-trailers up to 40 t (most frequent more than 12 m).

Buses and goods vehicles fall into the same category for automatic categorization based on the basis of the vehicle length, so busses cannot be identified separately according to the length of the vehicle. Vehicles of these categories have a similar length that can range from about 6 meters to 12 meters. Also, in regard of the reported measurement error of traffic counters, these categories may overlap each other. The abundance of individual vehicle categories can be determined by calculation based on the actual recorded share of this vehicle category on the relevant counting section according to the national census outputs on the same counting section.

When categorizing the volumes of vehicles obtained from automated devices on roads, it is necessary to proceed from the technology used by the device i.e. categorization based on weight, length, number of axles, respectively visual view of the record.

2.3. Transport demand survey beetween operators of freight transport and manufacturing enterprises

The aim of the transport demand survey between operators of freight transport and manufacturing enterprises is focused to obtain freight transport data on the territory of the Slovak Republic, the Czech Republic and Poland and at the same time can indicate which market segments are potential for shifting freight transport on the railway or intermodal transport. These data will serve as a basis for the calibration of the traffic model and will also complement the identification of the main road infrastructure for long-distance freight transport in the TRITIA region. The questionnaire survey of freight transport will include:

- road transport,
- rail transport,
- inland waterway transport,
- intermodal transport.

The purpose of the survey will be to map the movement of goods through SK, CZ and PL infrastructure, through a sample of respondents, both within the regions and in the direction of international links.

The performance of the transport demand survey between operators of freight transport and manufacturing enterprises serves to complement the survey outputs at border crossings. This type of survey is specific, especially in terms of the return on the sent questionnaire, because not all companies are willing to respond to the questions in the questionnaire for various reasons.

Therefore, it is important that the questionnaire be designed to answer general questions that don't break the law on the protection of personal data and competition law in any way. The questionnaire should be short, clear and specific. It should not contain questions requiring too detailed answers that need to be found in a more distant past.

The questionnaire will be divided into the general part and the demand part:

- general information consist of:
  - company name,
  - contact details,
  - business,
- Demand questions cover information about:
  - transport mode (road, railway, inland waterway, air, intermodal),

- transport nature (national, international),
- transported commodity (agricultural products, food and beverages, wood, fuels, raw materials, metal products, construction materials, fertilisers and chemicals, consumer products, and others),
- source and target destination (city, region, country),
- frequency of transport (non-scheduled/scheduled – daily, weekly, monthly etc.),
- quantity of goods transported per calendar year (t, m^3)

It is necessary to select a reasonable sample of respondents from each country of the TRANS TRITIA project that covers the geographical interest area. Respondents in a demand survey questionnaire will be picked out from carriers and factories operating in the TRITIA region or neighbouring regions beyond the border areas of the TRITIA region with strong transport links to this region operating in individual modes of transport as they ensure the transfer of goods between origin and destination.

The questionnaire translated in their national language will be sent to the selected subjects for the filling. The form will consist of 4 pages. The questionnaire delivered to your company consists of 3 main parts:

- General part of the questionnaire.
- Part A – Current state of freight traffic flows and relations.
- Part B – Potential usage of Oder inland waterway – shift from the current status

The General part of the questionnaire is mainly concerning the general contact information about your company and also contains the legend necessary for completion of the questionnaire in Part A or Part B.

The first part of the questionnaire (A) is oriented at mapping of the current traffic relationships of the flows of goods in you company. It contains questions about the used mode of transport, nature of the transport, transported commodity type, origin and destination of transport.

The second part of the questionnaire (B) is focusing on the potential use of Oder inland waterway. In this part of the questionnaire we are looking for the answer to the question, if in case of modernization, or building of the inland waterway Oder in the Poland and Czech Republic, heading north to the Baltic Sea, you company will potentially use this connection for satisfying your transport needs.

The questionnaire itself in the form of a table is available in ANNEX 2 and accompanying document: “Inland waterway Oder”, which is part of the questionnaire is available in ANNEX 3.

An example for filling the questionnaire is given in the following table.

Table 1 Example of questionnaire filling by the carrier

Serial number	Transport mode	Transport nature	Transported commodity	Origin of transport	Place of transhipment (intermodal transport)	Destination of transport	Non-scheduled transport	Scheduled transport	Quantity of goods transported per calendar year (t)	Quantity of goods transported per calendar (m^3)
1	Road	National	Wood	Zvolen	/	Čadca		1-2x		1 000
2	Road	International	Fuels	Nováky	/	Třinec	6-10x		300	

Serial number	Transport mode	Transport nature	Transported commodity	Origin of transport	Place of transhipment (intermodal transport)	Destination of transport	Non-scheduled transport	Scheduled transport	Quantity of goods transported per calendar year (t)	Quantity of goods transported per calendar (m^3)
3	Road/Rail	International	Metal products	Martin	Teplička n.V./-	Krakow	2-5x		1 500	

3. Conclusion

The aim of the methodology for the preparation, performance and processing of traffic surveys is to provide relevant data for the TRITA TRANS traffic model. An important role of the methodology is to typologically define and unify the surveys to be carried out and to define the procedures for their performance and evaluation in order to ensure uniform data regarding the interest area. This methodology generally guides the work of the individual partners in working on traffic surveys.

Detailed information on the preparation, performance and evaluation of individual surveys will be given in output D.T3.1.2 (Preparation and performance of annual traffic surveys).

ANNEX 1

The questionnaire for traffic survey on border crossings (SK-CZ, CZ-PL, SK-PL)

ORIGIN - DESTINATION SURVEY

CONTACT (place manager):

BORDER CROSSING:

NAME:

DATE:

TIME:

DIRECTION: COUNTING SITE:

SERIAL NUMBER OF QUESTIONNAIRE:

QUESTION num.: 1 2 3 4

s. num.	time	vehicle category		origin	destination	route - according to the coding key	frequency			
							scheduled		non-scheduled	
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y
		MGVT	HGV				5-7 x W	1-2 x W	1 x Y	6-10 x Y
		HGVT	ST				3-4 x W	<	2-5 x Y	> 10 x Y

Legend:	
MGVT	medium good vehicle with trailer
HGV	heavy good vehicle
HGVT	heavy good vehicle with trailer
ST	semi-trailer unit
W	week
Y	year

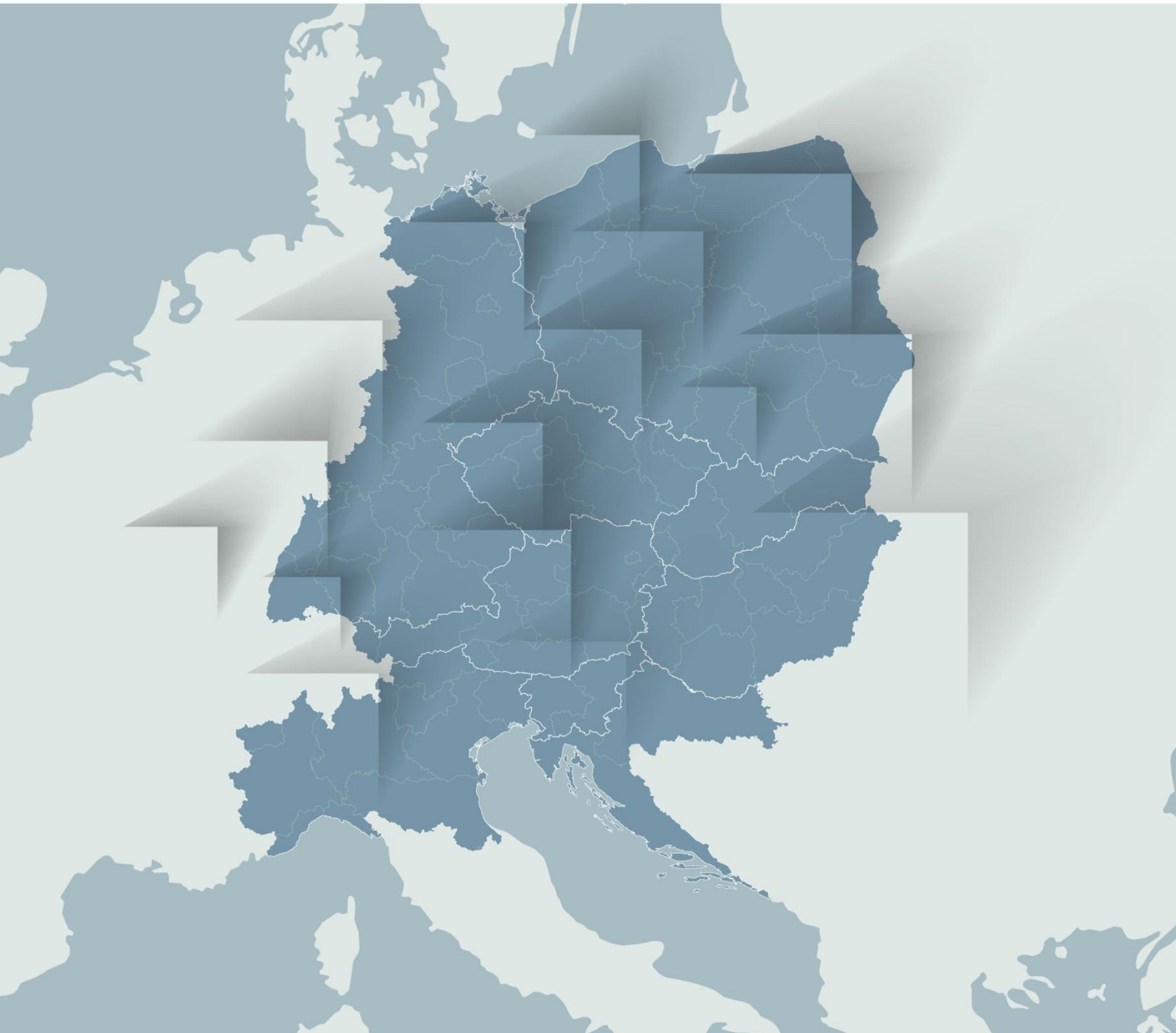
ANNEX 2

Questionnaire for transport demand survey between operators of freight transport and manufacturing enterprises - questionnaire

Interreg CENTRAL EUROPE
European Union European Regional Development Fund

TRANS TRITIA

Transport demand survey between operators of freight transport and manufacturing enterprises



Dear sirs,

(Name of project partner) addresses your company in order to carry out a demand transport survey of the freight transport within the international project TRANS TRITIA funded from the European Regional Development Fund through the Interreg CENTRAL EUROPE financial scheme.

Purpose of the survey

The purpose of the transport demand survey is to obtain data on the freight transport in **(project partner country)**, which shall serve as the basis for the TRANS TRITIA traffic model calibration. The aim of the survey is to map the movements of goods on the infrastructure within Slovakia, Czech Republic and Poland on major international links. The results of the survey will serve to support the development of transport infrastructure in TRITIA area in order to improve the conditions of transport.

Instructions for the questionnaire

The questionnaire delivered to your company consists of 3 main parts:

- General part of the questionnaire.
- Part A – Current state of freight traffic flows and relations.
- Part B – Potential usage of Oder inland waterway – shift from the current status

The General part of the questionnaire is mainly concerning the general contact information about your company and also contains the legend necessary for completion of the questionnaire in Part A or Part B.

The first part of the questionnaire (A) is oriented at mapping of the current traffic relationships of the flows of goods in you company. It contains questions about the used mode of transport, nature of the transport, transported commodity type, origin and destination of transport. The guidance for correct questionnaire completion is available in the general part of the questionnaire. It is not necessary to answer for each individual transport, but it is more appropriate to join them in homogeneous groups of the annual data for the last complete calendar year of operation (2017), by transport direction (routes), transport mode used, origin and destination of transport.

The second part of the questionnaire (B) is focusing on the potential use of Oder inland waterway. In this part of the questionnaire we are looking for the answer to the question, if in case of modernization, or building of the inland waterway Oder in the Poland and Czech Republic, heading north to the Baltic Sea, you company will potentially use this connection for satisfying your transport needs. Therefore, from the existing transport needs filled in Part A, it is necessary to identify those that could be transported (partially at least) by this infrastructure. More detailed information about the Oder inland waterway and about potential connections are available in the accompanying document: “Inland waterway Oder”. In order to complete the Part B of the questionnaire, it is necessary to use the same principle as for the first part (A).

In case of any questions, please contact our company, where our authorized personnel will assist you or explain any ambiguities.

If the project impressed you and you want to know more about it, there are information channels of the project in the accompanying document.

I would like to thank you in advance for the completion and delivery **(delivery e-mail)** of the questionnaire.

Term of the questionnaire delivery: **(term)**

Best Regards (name, position, contact)

Questionnaire

Survey of freight transport in TRANS TRITIA region

Name of your company	
Contact information **(due to possible supplementary questions from our side)**	
Business activity of your company	

Legend

Survey data	Specific characteristics
Transport mode	Road / Railway / Inland waterway / Air / Multimodal*
Transport nature	National / International
Transported commodity	agricultural products / food and beverages / wood / fuels / raw materials / metal products / building materials / fertilizers and chemicals / consumption products / other
Origin and destination of transport	Country, Region (voivodship), District / Country, Region (voivodship), District**
Frequency of transport	Non-scheduled – 1x / 2-5x / 6-10x / >10x per year Scheduled – 5-7x / 3-4x / 1-2x / <1x per week
Quantity of goods transported per calendar year	ton / m^3 per year

*For multimodal transport, please also fill in the place of transhipment between different transport modes

**If origin or destination of transport: is from CZ, PLN, SVK use name of region or voivodship, if it is from Žilina region, Moravian-Silesian region use district and in Opole and Silesian voivodship use subregion, in other cases use name of the country.

Part A – Current state of the traffic goods flows in the company

Serial number	Transport mode	Transport nature	Transported commodity	Origin of transport	Place of transhipment (intermodal transport)	Destination of transport	Non-scheduled transport	Scheduled transport	Quantity of goods transported per calendar year (t)	Quantity of goods transported per calendar (m^3)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Part B – Potentially usage of Odra inland waterway – shift from the current status

Serial number	Transport mode	Transport nature	Transported commodity	Origin of transport	Place of transhipment (intermodal transport)	Destination of transport	Non-scheduled transport	Scheduled transport	Quantity of goods transported per calendar year (t)	Quantity of goods transported per calendar (m^3)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

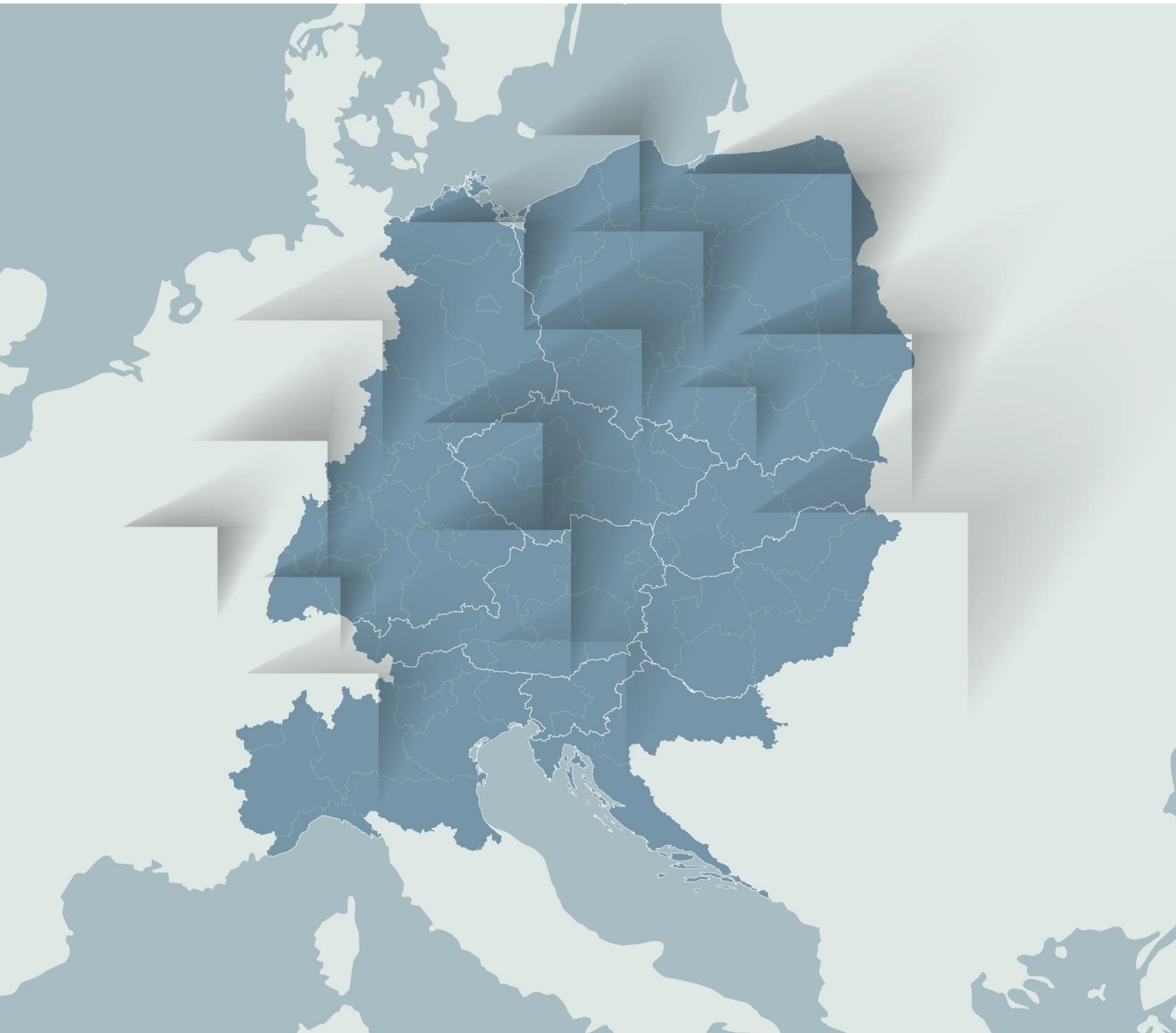
ANNEX 3

Questionnaire for transport demand survey between operators of freight transport and manufacturing enterprises - the accompanying document: “Inland waterway Oder”

Interreg CENTRAL EUROPE
European Union European Regional Development Fund

TRANS TRITIA

General information about project and about inland waterway Oder



Project Name: Improving coordination and planning of freight transport on TRITIA Territory (TRANS TRITIA)

Programme Priority: 4 Cooperating on transport to better connect CENTRAL EUROPE

Specific Objective: 4.2 To improve coordination among freight transport stakeholders for increasing multimodal environmentally-friendly freight solutions

General information about project: http://www.interreg-central.eu/Content.Node/TRANS-TRITIA.html, https://www.facebook.com/transtritia

Lead Partner: Górnośląska Agencja Przedsiębiorczości i Rozwoju Sp. z o.o (GAPR)

Project Partners: Sdružení pro rozvoj Moravskoslezského kraje z.s. (SPR MSK), Výskumný ústav dopravný, a. s. (VUD), Dopravní projektování, spol. s r.o. (DP), Žilinská univerzita v Žiline (UNIZA)

The Project wants to improve information, planning and coordination among regional authorities, administrators of transport networks and freight transport stakeholders. The project will the cross – border, transnational, and interregional cooperation of its members with an objective to strengthen economic and social cohesion to achieve goals defined in strategies Europe 2020 or White Paper – Roadmap to a Single European Transport Area

Specific aim of the project is to increase cooperation between regions and infrastructure administrator by reason of more effective development of transport infrastructure with supporting of the environmentally friendly modes of transport in the areas of Žilina, Moravian-Silesian, Silesian and Opole regions (TRITIA area)

Project activities are distributed in 3 main topics:

- Regional strategy and action plans for multimodal freight transport in TRITIA area,
- Multimodal transport in TRITIA area
- Traffic model of the TRITIA area

TRITIA area (EGTC TRITIA)

The decision to establish EGTC TRITIA was made by the leaders of the four regional governments of Moravian – Silesian Region (CZ), Opole Voivodeship (PL), Silesian Voivodeship (PL) and Žilina Self – governing Region (SK) in 2009, who subsequently made steps leading towards its establishment. The European Grouping of Territorial Cooperation TRITIA limited (EGTC TRITIA) was established in 2013 by its entry into the Register of EGTCs administered by the Ministry of Foreign Affairs of Poland. EGTC TRITIA has an area of 24 566,09 km2 and a population of 6,5 mil. people. There are two cities with more than 300 thousand inhabitants - Katowice (PL) and Ostrava (CZ). These conurbations together with other important city of Žilina (SK) is tied by intensive socio - economic relations. The Grouping has been established to facilitate and spread the cross – border, transnational, and interregional cooperation of its members with an objective to strengthen economic and social cohesion, particularly through implementation of territorial cooperation projects or programmes.

WHITE PAPER: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system

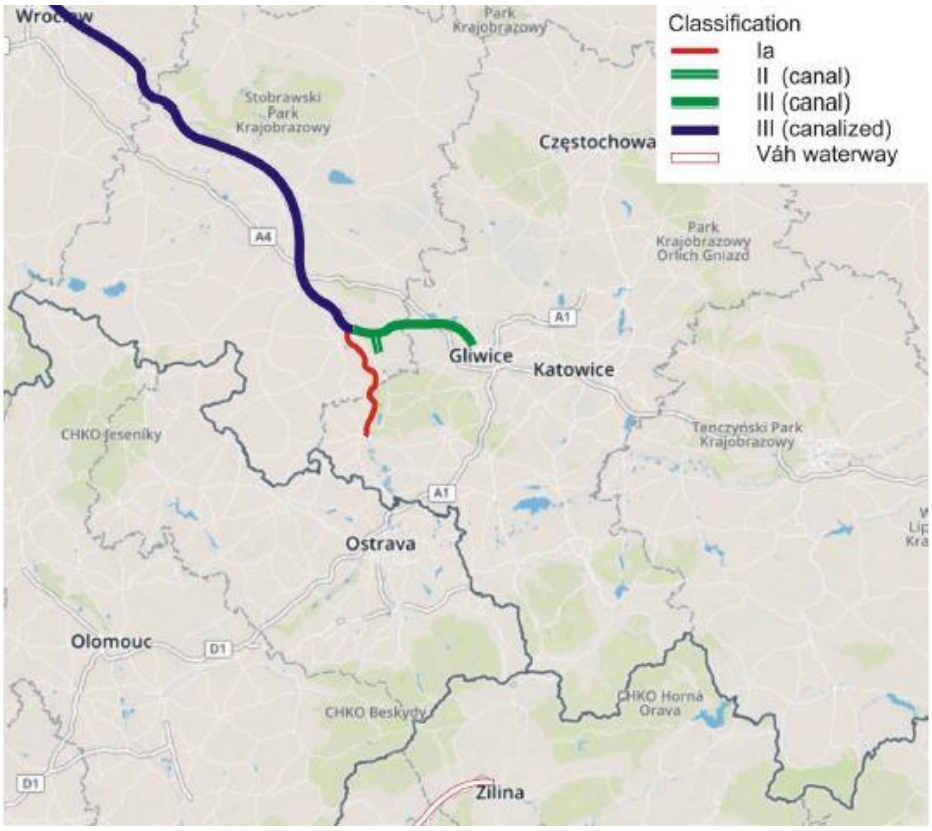
- 30% of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050, facilitated by efficient and green freight corridors. To meet this goal will also require appropriate infrastructure to be developed.

TEN-T network in TRITIA area:

- Baltic Adriatic (road and railway transport)
- Rhine-Danube (north part – road and railway transport)

Oder inland waterway

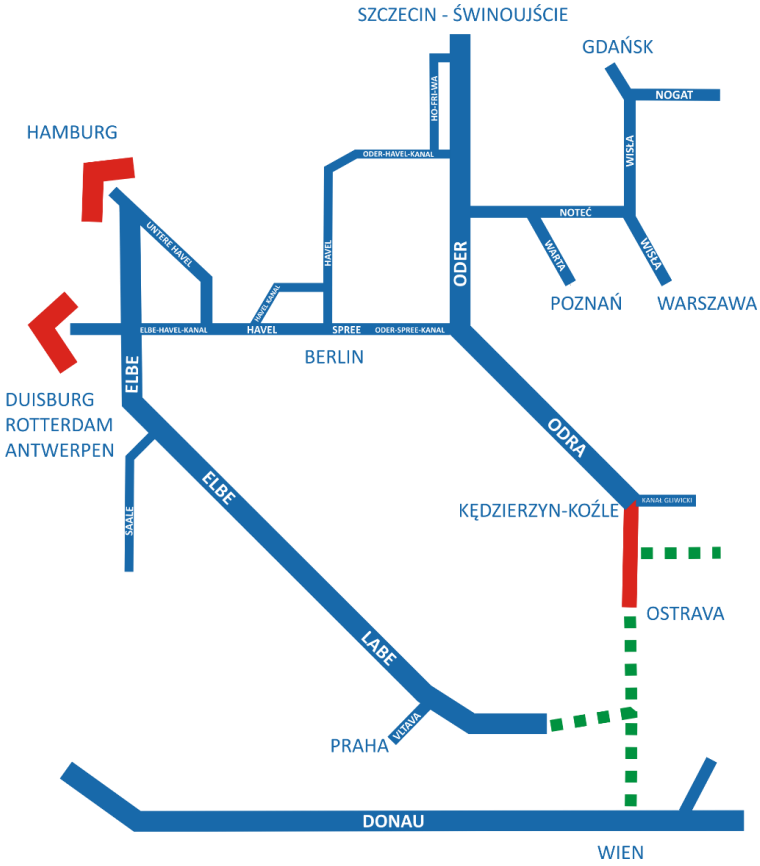
Oder waterway and it is beginning in Gliwice and ending in Szczecin; the total length is almost 690 km, of which 41 km is the Gliwice Canal. In Kędzierzyn-Kozle, the Gliwice Canal connect to the route of the Oder River, which in the place continues south direction to the border between Poland and the Czech Republic. The Kędzierzyński Canal (a length of 5.6 km) also connects to the Gliwice Canal.



Current status of the Oder inland waterway in TRITIA area

The Oder Waterway with the Gliwicki Canal and Kędzierzynski Canal connects the north-western part of the TRITIA area by waterway with the seaport in Szczecin and Western Europe via the inland cannals in Germany (Eisenhüttenstadt-DE). In Frankfurt an der Oder crosses the Oder inland waterway with TEN-T corridor North sea – Baltic (road and railway transport). However, this classification does not mean full navigability, difficulties on shipping routes may be caused by their modernization and transit depth. Navigation conditions on waterways are announcing regularly by an appropriate office.

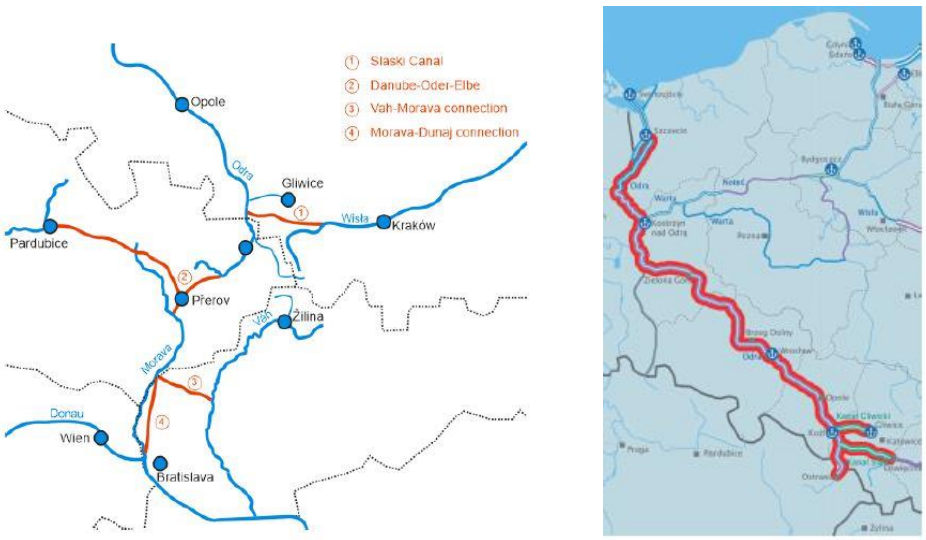
Within the Development strategy of inland waterways in Poland is in Priority axis 1 defined a modernization of inland waterway Oder (to classification Va) with removing of the bottlenecks from border with Czech republic to seaport in Szczecin and built Slaski Canal. Slaski Canal is planned 90 km long section, which will connect rivers Oder and Vistula. Implementation of this connection will enable the regions around Cracow to the European inland waterways. In Poland are planned investments around 680 mil. EUR (2,9 mld PLN) to the 2020 and between 2021-2030 around 6,5 mld. EUR (27,8 mld. PLN) according to this strategy.



Possible connection of the Oder inland waterway

There will be necessary cooperation with Czech Republic in development Oder inland waterway there, because it is necessary to build canal from Polish border to Ostrava with inland waterway port. In Oder inland waterway at TRITIA area are at the moment ports:

- Gliwice,
- Kędzierzyn Kozle,
- Opole.



Planned development of the Oder inland waterway in TRITIA area