

The Land Trans-Shipping Terminal In Processes Flow Stream Individuals Intermodal Transportation

A. Kusminska-Fijalkowska & Z. Lukasik
Technical University of Radom, Radom, Poland

ABSTRACT: The influence has the system of the exchange on enlargement of the efficiency of the work trans-shipping land terminal and processing information, which in he will improve the processes of the flow of the individuals of the intermodal transportation which was presented in the figure of algorithms more considerably to the measure. The algorithmization makes possible execution mathematical analyses, as also the influence has on the quality of the executed processes of the flow of the stream of the individuals of intermodal transportation in the trans-shipping land terminal.

1 INTRODUCTION

Correct functioning the whole chain of intermodal transportation depends in the considerable measure on proper functioning land terminals, and in this first of all from their ability infrastructural to the executing the trans-shipments, cost, range of offered services, quality and reliability. Presented algorithms in the article, in the considerable stage will contribute to improvement of the processes of the flow individuals in the land terminal to prevent in the future the situation from Fig. 4 obviously they were created stay on the basis of the observation of the real object in which shortcomings were observed. The algorithmization makes possible in so folded system what the land terminal is to conduct the effective mathematical analysis of drawing ahead processes. Because the modern terminal of intermodal transportation is more the than simple trans-shipping point and develops in the direction of creating the centres of the service of the transport of cargos about the wide range of offered services. (Łukasik Z., Kuśmińska A., Matejek T. 2006-2007)

2 ANALYSIS OF THE STATISTICAL DATA ARRIVING THE INDIVIDUALS INTERMODAL TRANSPORTATION TO LAND TERMINAL ON TRAIN

Road vehicles arrive on land terminal (Fig. 1) to deliver the individuals on given string of cars, the larger number arrives with the considerable store of the

time before string of cars. These attentions are confirmed by conducted investigations. The switching of the branch of road and railway transportation is the aim of applying intermodal transportation in net and their integration within the of the general conception. (Kuśmińska A., Łukasik Z. 2005)

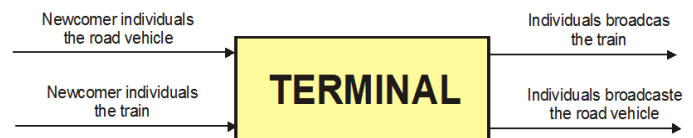


Figure 1. The individuals on entry and exit land terminal (Kuśmińska A., Łukasik Z. 2005)

The presented option of arriving the individuals on the land terminal road vehicles (Fig. 2), the arriving the individuals on the terminal represents, a lot of earlier the before string of cars he is prepared to trans-shipping operations, and now he the trans-shipping device has to execute double operations in this case with, what operating costs, the time of the expectation of individuals join obviously.

The solution eliminating the indirect trans-shipment represents the Fig. 3 individual they arrive in such spaces of the time that they are subjected the direct trans-shipment from the road vehicle on the wagon of string of cars.

It was affirmed in the result of the analysis of statistical data gathered from the observation of the real object that individuals arrived the road vehicle to

land terminal with considerable temporary superiority on given string of cars. This introduced on the graph in the co-ordinate time became before the string of cars will lower the terminal, and day of arrival of individual (Fig. 4). What the situation from the real object is the very „poor” case he answers the option from graph (Fig. 2).

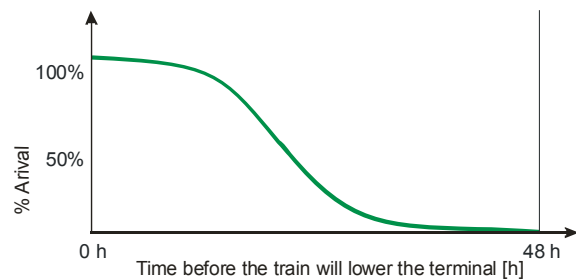


Fig. 2. Proportional arrival of road vehicles with individuals in the function of time (poor option of the arrival) (S.C.2.70 Deliverable 3. 1999)

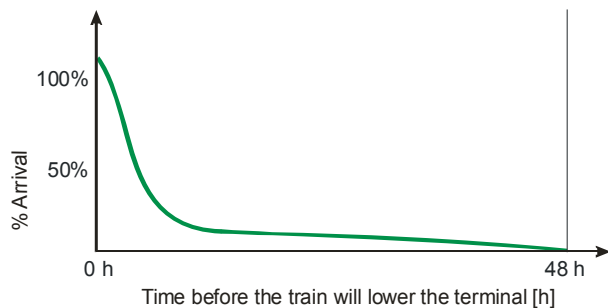


Fig. 3. Proportional arrival of road vehicles with individuals in the function of the time (best option of the arrival) (S.C.2.70 Deliverable 3. 1999)

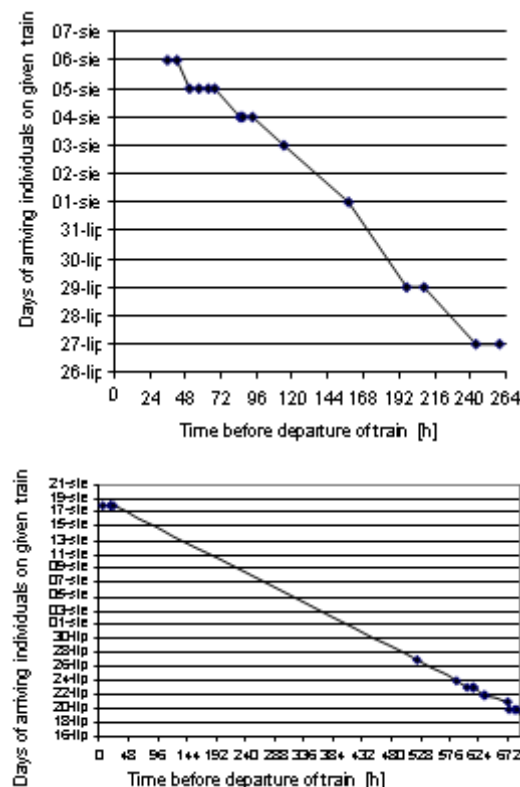


Fig. 4. Arrival of road vehicles with individuals in the function of the time [h] (own study)

Intermodal transportation gained temporary superiority over road transportation in our national conditions, you should improve the processes of arriving the individuals road vehicles to trans-shipping terminal what is visible on the graph in co-ordinates % arriving individuals the road vehicle to land terminal, and the time before the string of cars will lower terminal (Fig. 4), and also improve the flow of individuals in the terminal itself which is the bonding bar of the road and railway piece. (Kuśmińska A., Łukasik Z. 2006)

3 ALGORITHMS OF THE REALIZATION PROCESSES IN THE TRANS-SHIPING LAND TERMINAL

The influence also has efficiency of realization of processes such on effective functioning land terminal (Fig. 1) how:

- analysis offer ask;
- realization of orders;
- railway- road service;
- road-railway service.

The presented algorithm of functioning land terminal (Fig. 5) will make possible to improve processes drawing ahead in the land terminal, how also the chain of intermodal transportation.

Analysis Offer asks (Fig. 6) this the first socket with the customer the party is whose aim as the largest number of orders, the question offer from the customer is delivered in the written mould on the terminal. Directed to the Trade Aggregate the aim of preparing the offer becomes after executing the registration, the party is the priority obviously as the largest number of orders. The Trade Aggregate should check in first order, if he is in the state match the customer during realization to requirements the order, if you should so execute all steps havings on the aim of the receipt of given to the correct calculation costs and prepare the offer. Then after checking and identify, that the offer was prepared well sent to the customer (fax, e-mail) becomes. After dispatch offers, responsible worker for the correct process of offering the services, he contacts with the customer the aim of making sure, what to the regularity of conditions and execution of the interview, what to possible her party. In the case of the settlement of the incompatibility of the conditions of offer from the customer expectation the worker after the consultation with superior makes the corrections of the offer. However, while the introduced offer becomes accepted by the customer the next stage of the process is realized - **the realization of order** (Fig. 7).

The realization of the order which the realization of services is the main aim: railway - road, road- railway in as the shortest time (Fig. 7) the or-

der of the realization of the service is delivering to trans-shipping terminal in the written mould (fax, e-mail). The realization of the order follows after executing the analysis of the agreement of working plan and the identification of the realization of the service. While executing the order the opinion of the regularity of the realization is made. Responsible aggregate for the realization of the order represents the conclusion to the management terminal in the case of incompatibility from the customer expectation. When the customer undertakes reclamation workings begun then becomes the peaceable conduct with the internal instruction.

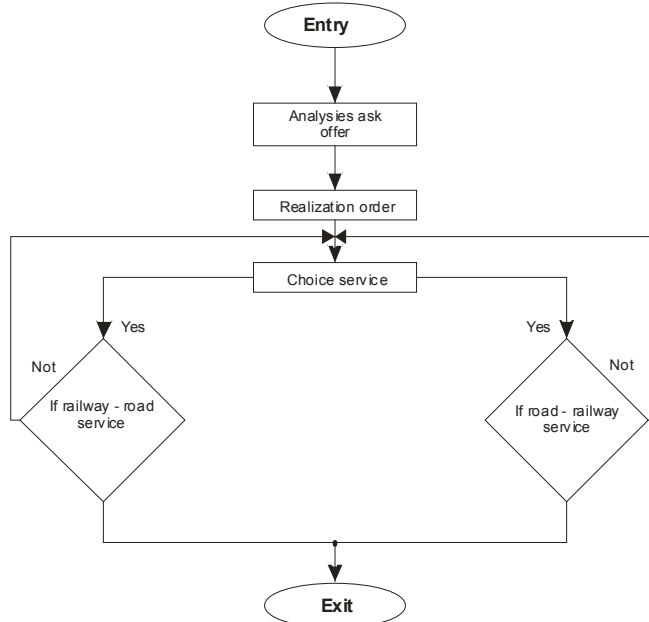


Fig. 5. Algorithm of functioning land terminal (own study)

- railway - road,
- road - railway.

The main aim of the service is the transport of intermodal individuals on near the minimization of the standstill of individuals on the terminal customer order **railway - road** (Fig. 8). While individuals on wagons are on the trans-shipping track he follows identification, agreements with the transports letter (working plan) (technology RFID). The dispatcher prepares them to the landing after affirming agreement and the party of documents (letter transporting-identifying individuals). Individuals subjected the direct trans-shipment become unblocked on wagons.

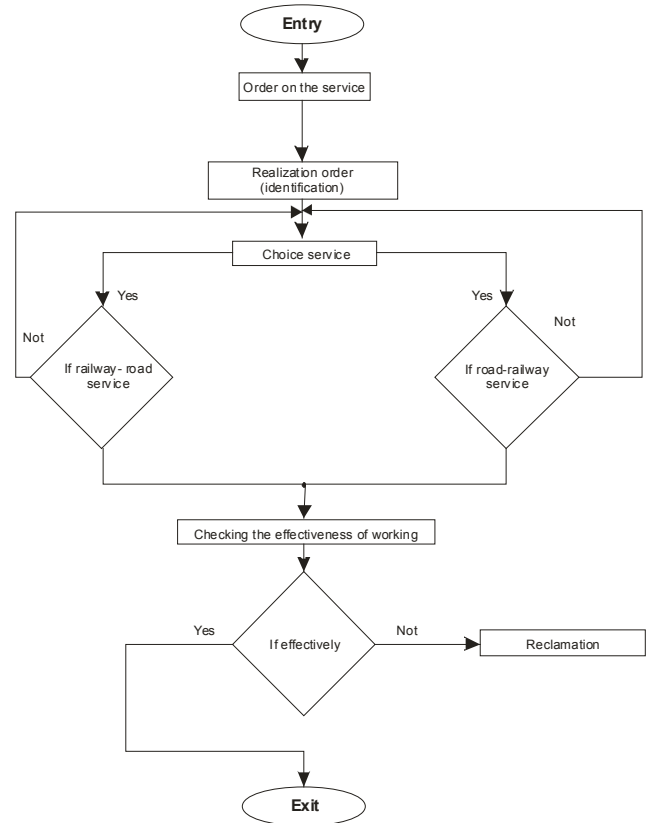


Fig. 7. Algorithm of the realization of orders (own study).

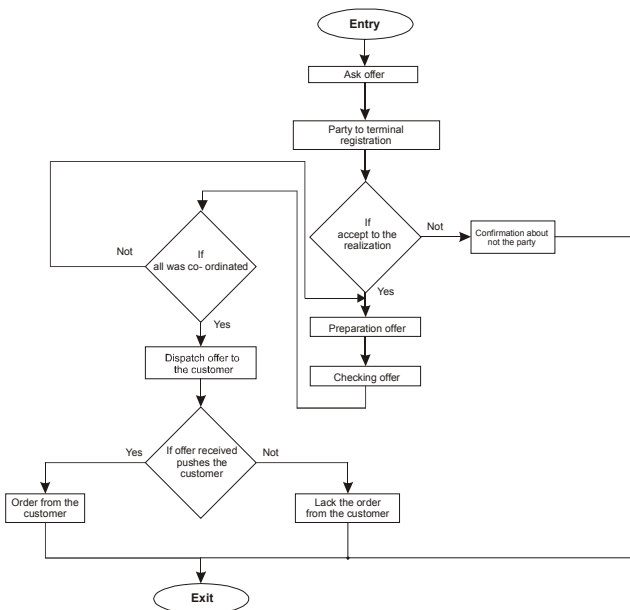


Fig. 6. Algorithm of the analysis offer asks (own study).

During the realization of the order you should haul the kind of the realization of the service:

The choice of the technology of the trans-shipment follows in dependence from: the condition of the individual: or vain, if capacious, the type: container 20', replaceable body etc. and also her technical state. He next is considered the decision, which to use the device during the trans-shipment, if the gantry, if the jacks cart, and to accelerate two simultaneously maybe trans-shipping works. Already possessing information the operator of the device places them if the given individual is subjected the direct trans-shipment on the fix to the trans-shipment after executing the choice i.e. he can be charged on the waiting on her wagon or on the road vehicle. He follows the identification of wagon or road vehicle and direct trans-shipment, the protection of the individual and documentary evidence the realization of the service.

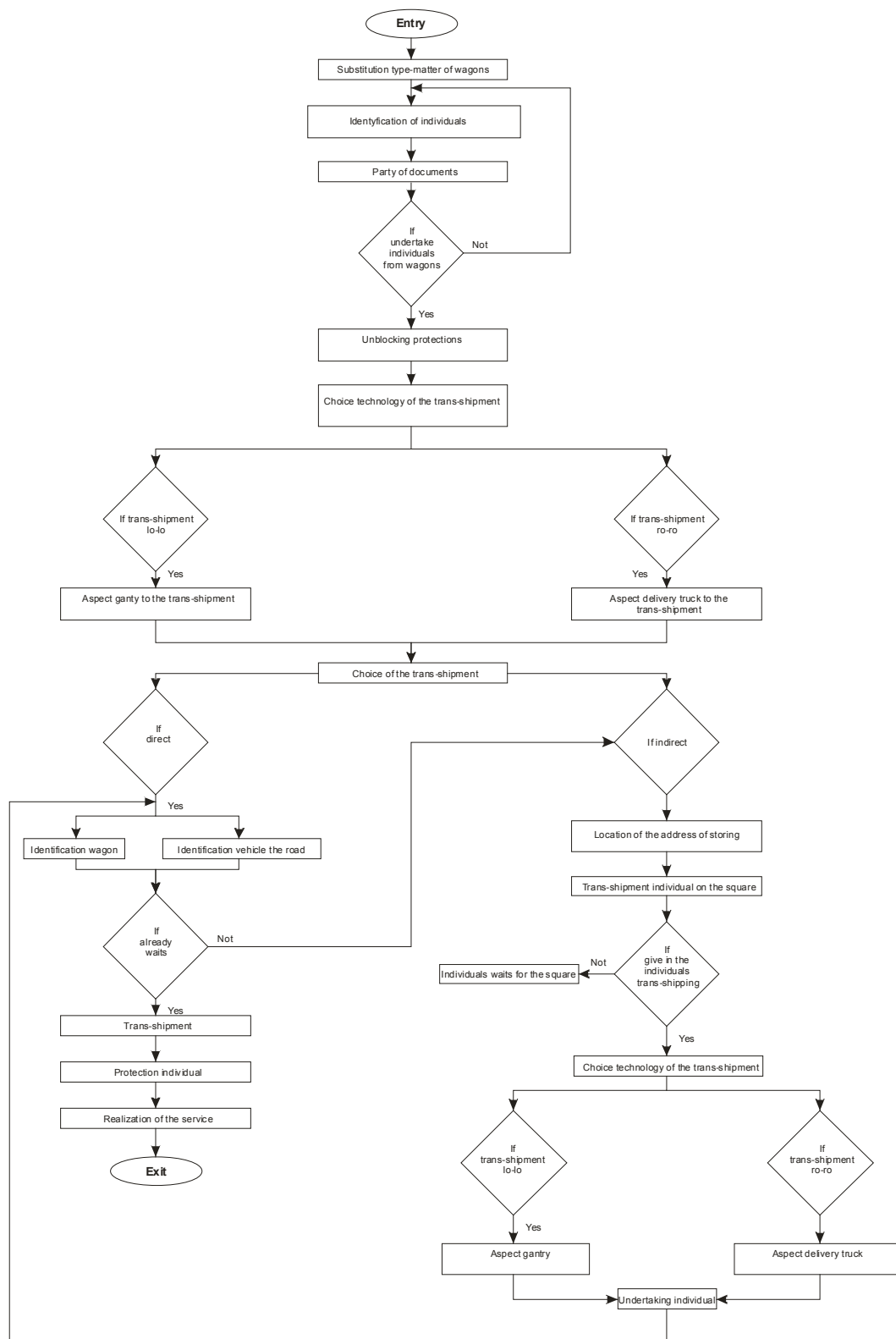


Fig. 8. Railway-road (own study).

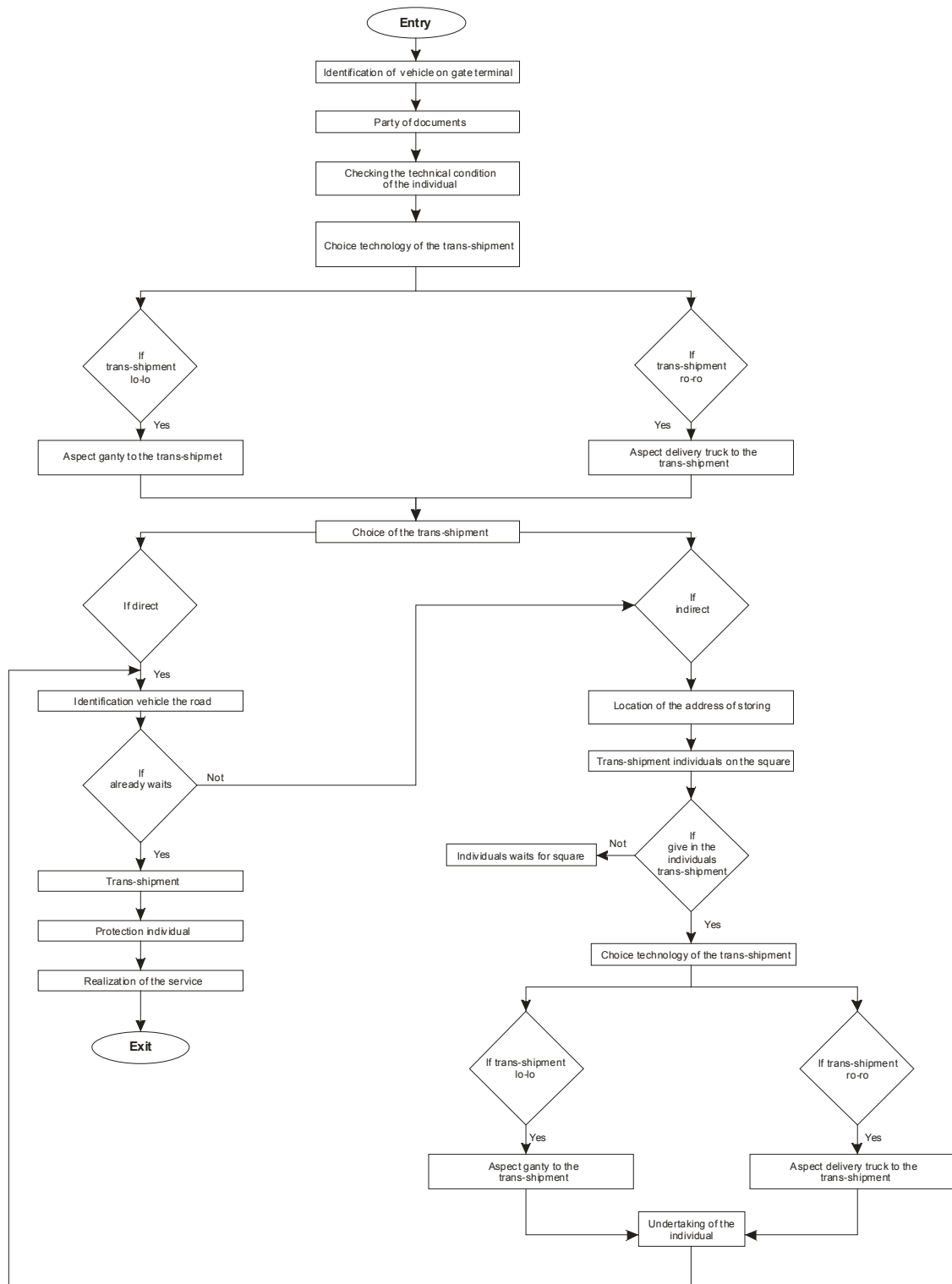


Fig. 9. Road - railway (own study).

In the case, when road vehicles did not arrive on the time of the individual subjected the indirect trans-shipment find, and now the operator of the trans-shipping device before he will undertake the individual from the wagon he knows her exact location on the component square. Trans-shipping works begin then and putting individual in sectors on the component square. When the delayed road vehicle arrives on the land terminal after given individual her identification (technology RFID) follows on the square then, the choice of the technology of the trans-shipment, trans-shipment, the protection of individual on the semitrailer of the road vehicle and last stage documentary evidence the realization of the service. The land terminal leaves after executing all actions individual.

The algorithm of **the road-railway service** the realization of the operation of the efficient trans-shipment whose aim minimalizing the time is also spent individuals on the land terminal was introduced on (Fig. 9) While the individuals arrive on the land terminal the road vehicle on the gate subjected the identification, the type of individual, protection, technical state become, received documents become then and the decisions are made on the basis of contained information, what to the choice of the technology of the trans-shipment (the trans-shipment lo-lo perpendicular, if horizontal ro-ro like simultaneously lo-lo, ro-ro the aim of acceleration of the works of trans-shipping). The operator prepares them to the trans-shipment after the choice of the device. In the case, when he undertakes the individual from the semitrailer of the road vehicle he possesses information, if the given individual is subjected trans-shipping direct, if indirect. The operations of the direct trans-shipment are the priority. After identification the wagon on, which the individual has to settle the operations of the trans-shipment begin protection her and documentary evidence the realization of the service then. In the case of the indirect trans-shipment the operator before he will undertake the individual from the semitrailer of the road vehicle he knows exact location and the sector of assembly her on the square (RFID) because the wagons are not prepared to the trans-shipment yet. When wagons be prepared, one can begin the works loading of the individuals which are subjected identification on the square terminal (RFID). The next stage is the choice of the technology of the trans-shipment and undertaking of the individual from square and placing her on the wagon after identification individual. When all individuals are already on wagons moulding the string of cars safe become, in the documents of the realization of the service are prepared between the time. The type - matter of wagons with individuals (conferment) leaves the land terminal after executing all formalities.

4 CONCLUSIONS

The integration of forwarding processes, he requires the development of international systems joint in one net about the large possibilities of the flow of the freight pulp. One talks about the intermodal transportation which unites railway transports with road and sea near one figure of the cargo behaviour more and more often. Support of the development of terminals in the chains of intermodal transportation, the limitation of the transports of goods will let suppose the road transportation which guides not only to decay of the road infrastructure but enlargement of the release of exhaust gas also causes what he guides to the degradation of the natural environment in the consequence. Strong exists so one need the set - back of the tendency to growing utilization of car transportation on the thing of intermodal transportation.

One notes down on the Polish forwarding market of the hesitation of the pace of the growth since several years and the lack of the uniform and dynamic development of transports intermodal. He is the result of this the worsening quality of railway services, the growth of the time of the service of intermodal individuals on terminals (among others problems with identification individuals on the component square), the deepening price uncompetitive of railway transportation in the relation to car transportation and the lack of the complex and effective instruments of the forwarding politics of the state, supporting the intermodal transportation. According to the expectations of the growth of intermodal transportation in the Poland, the terminals have to be prepared on the party of the larger number of inflowing streams individuals. (Kuśmińska A., Łukasik Z. 2005) many of Polish land terminals the present moment stays trans-shipping terminals from the name exclusively. Land terminals functioning on the terrain of our country in the future matched charged tasks should also improve the system the processing and the circulation the information, which together with the system of steering the stream individuals, he was presented in the figure of algorithms and which he will improve the processes in the land terminal.

LITERATURE

- Kuśmińska A., Łukasik Z.: „Models trans-shipping processes in the intermodal terminal” Technical University of Radom, „LogiTrans”, Szczyrk 2005
- Kuśmińska A., Łukasik Z.: „Models the processes of the flow JTI in the land terminal”, „IntLog” Stockholm 2006.
- Łukasik Z., Kuśmińska A., Matejek T- (stage II): „ Intermodal transportation in the processes of the flow of cargos” the stage II, III, Technical University of Radom 2006-2007
- S.C.2.70 Deliverable 3: the „Design of of Platforms Simulation environment” Lugano 31.01.99