REDUCING TRUCK PARKING TIMES WITHIN THE AILN MIOVENI LOGISTICS PLATFORM

Florentina-Ionela MOLEA[1], Miron ZAPCIU[2]

Rezumat. *Lucrarea analizează timpii de staționare a camioanelor, evidențiind impactul acestora asupra eficienței logistice și a procesului de producție. În contextul industriei automotive, gestionarea optimă a fluxurilor de aprovizionare este esențială pentru evitarea întreruperilor operaționale. Analiza identifică principalele cauze ale întârzierilor, precum planificarea ineficientă a transporturilor, capacitatea limitată de descărcare și durata ridicată a proceselor de recepție. Pe baza rezultatelor obținute, sunt propuse măsuri de optimizare, inclusiv îmbunătățirea planificării, digitalizarea activităților logistice și utilizarea eficientă a resurselor. Implementarea acestor soluții contribuie la reducerea timpilor de staționare și la creșterea performanței operaționale.*

Abstract. *The paper analyzes truck downtime, highlighting their impact on logistics efficiency and the production process. In the context of the automotive industry, optimal management of supply flows is essential to avoid operational disruptions. The analysis identifies the main causes of delays, such as inefficient transport planning, limited unloading capacity and long reception processes. Based on the results obtained, optimization measures are proposed, including improved planning, digitalization of logistics activities and efficient use of resources. The implementation of these solutions contributes to reducing downtime and increasing operational performance.*

Keywords: Logistics, Downtime, Optimization, Production, Efficiency

1. Introduction

With the development of logistics activities and the increase in volumes, the number of trucks coming and going and the management needs of a logistics platform, the need to manage truck parking times when unloading or loading goods arose [9].

The management of parking times is one of the major challenges of a logistics chain, due to the blockage of reception and shipping flows and high costs. Therefore, in order to find the causes that lead to truck parking, it is necessary to carry out actions and analyzes on the organization of the activities carried out, to identify any malfunctions and to find solutions to eliminate them.

[1] Master Student, National University of Science and Technology POLITEHNICA Bucharest, Romania, E-mail: florentinamolea@yahoo.ro
[2] Prof. Ph.D. Eng., National University of Science and Technology POLITEHNICA Bucharest; Member of Academy of Romanian Scientists, Str. Ilfov nr.3, Bucharest E-mail: miron.zapciu@upb.ro

The study is based on the study conducted at the AILN Mioveni International Logistics Platform, with the main objective of improving the parking times of trucks when receiving goods within the Physical Reception Department, in order to maintain a continuous flow of receiving and shipping goods.

The performance of the AILN logistics platform is affected by the truck parking times when unloading goods. Therefore, an evaluation of the logistics reception process was needed in order to maintain a continuous flow. To achieve the purpose of the work, the following solutions were used to improve parking times:

- smoothing the arrivals of trucks in AILN - planning trucks in relation to customer orders and reception capacity;

- accelerating and optimizing unloading;

- accelerating and optimizing unloading;

- minimizing disputes.

Logistics includes all the activities necessary to manage the flow of goods between the supply of raw materials and final use [1],[2]. These activities are related to the movement and storage of goods, materials and information and must meet two fundamental objectives: achieving a high level of customer service at the lowest possible costs, respectively, creating a logistics system that allows an adequate response to customer requests [10].

Dima and Man (1999) present the hierarchy of logistics priorities, namely [3] (Fig. 1):

- compliance with contractual terms;

- improving transport competitiveness;

- developing computerized exchanges;

- faster deliveries than those of the competition;

- competitiveness in the field of stocks;

- reducing the cost of warehousing;

- developing a subcontracting policy.

The first four priorities essentially influence the level of services provided to customers, but in order to achieve a good level of performance, two main directions of activity are essentially necessary, directions that create the basis of the platform's logistics management system. The mission of logistics is to provide goods and services at the place, time and under the conditions requested by the customer, while obtaining maximum profit [4].

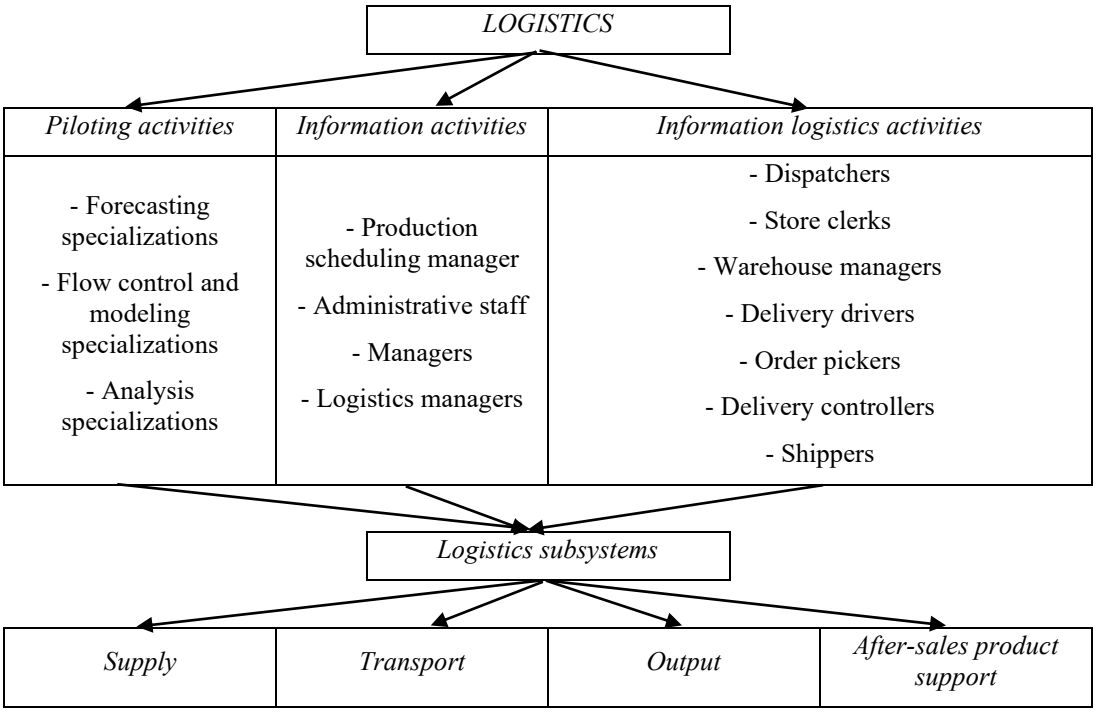


Fig. 1. Typology of participants in logistics activities

2. Bibliographic study

Organizing distribution logistics within AILN

The **A**lliance **I**nternational **L**ogistic **N**etwork (AILN) is the international logistics network of the Renault Group and a support in the international development of the Group and the Alliance [5],[8]. An AILN platform aims to ensure the flow of parts needed for automobiles between the geographical regions of the world, introducing an adapted logistics organization. The Group's vehicle and machine parts manufacturing plants and their partners are the main customers of the chain.

Classification of transit flows within AILN

The transit of parts on the AILN platform is carried out on different flows, as follows:

- **Direct flow - 1M**

The parts come from the supplier in large packages to the road station, where they are physically received. They are unloaded, the AILN label is attached, and they

are subsequently evacuated to expeditions. In the Expedition department, they are prepared on the ground for loading to be delivered to customers (Fig. 2).

Fig. 2. Truck loading mode with Flux 1M packaging

- **Regrouping flow – 2M**

The parts come from the supplier in small packages to the road station, where physical reception is carried out. The packages are unloaded and sorted onto pallets according to country, station and week. Each package is assigned an AILN identification label. The packages are taken to the regrouping areas into large packages. After applying the AILN "Mixed label", the packages are evacuated to the intermediate area for the purpose of preparing the cargo on the ground and sending it to customers (Fig. 3).

Fig. 3. Truck loading mode with Flux 2M packaging

- **Conditioning flow – 3M**

The parts come from Dacia in Dacia-specific packaging to the road station, where they are physically received. They are unloaded, the AILN label is attached, and they are then stored in the stock area for manufacturing. The parts from the 3M flow are supplied to the workstations for conditioning - they are packed in AILN-specific packaging (cardboard boxes, wooden packaging, metal packaging). After conditioning, the packaging is evacuated to the shipping area for the purpose of preparing the cargo on the ground and shipping it to customers (Fig. 4). The 3M flow is the most expensive flow.

Fig. 4. Truck loading method with Flux 3M packaging

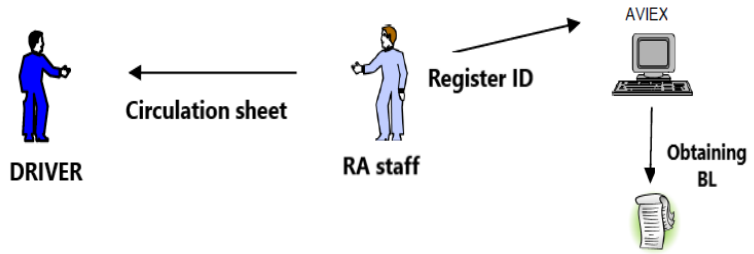
❖ **Conditioning flow - 8M - regrouping**

The parts (small size) come from Dacia in Dacia specific packaging to the road station, where physical reception is carried out. They are unloaded, the AILN label is attached, and they are subsequently stored in the stock area for manufacturing. The parts from the 8M flow are supplied to the workstations for conditioning - they are packed in AILN specific packaging (small packaging), then regrouped in large packaging (cardboard boxes, wooden packaging, metal packaging). After conditioning, the packaging is evacuated to the shipping area for the purpose of preparing the cargo on the ground and shipping it to customers.

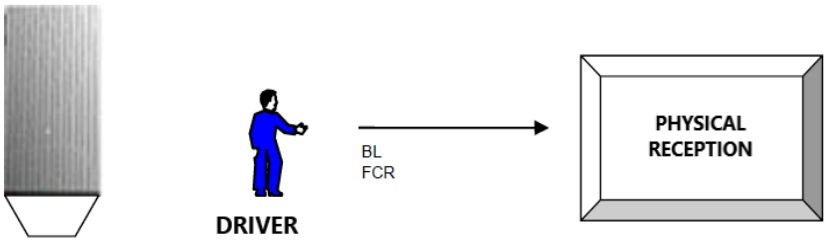
- **Analysis of truck parking times within AILN**

Reception represents the operation of identification and quantitative and qualitative verification of the goods received within the logistics platform [6],[7]. The reception has as its objective the verification of several aspects regarding the quality, the quantity, the exact fulfillment of the contract that regulates the relations between the supplier and the beneficiary and between them and the transport company. The route of a truck within the logistics platform AILN Mioveni is presented in the Fig. 5. The driver presents himself with the documents (Invoice, FC, BL, CMR) at the Administrative Reception (RA) office.

The Administrative Reception staff registers the truck, filling out the tracking form with the traffic form number, truck arrival/entry time, and unloading station number.



After the Administrative Reception, the truck passes through the DSG control. Subsequently, the truck enters the AILN, waiting in the waiting area if there are no free ramps. After a ramp is released, the truck enters for unloading. During this time, the driver hands over the documents to the Physical Reception office, in order to carry out the reception and quantitative and qualitative control.



The logistics process flow chart (Fig. 5) shows that trucks must wait in the following situations:

- The truck is waiting in the waiting area because the ramp is not free;
- The truck is waiting on the ramp, after the truck has been uncovered, because the logistics operator is not available for unloading;
- The truck is waiting for unloading because there is no free slot for unloading;
- When an anomaly is detected, the truck is waiting for the dispute to be completed.

This work aims to improve and streamline truck parking times within AILN, with the aim of having a continuous flow of incoming goods, minimizing total costs.

The performance indicators analyzed are the following:

- Ƭ1 = time to perform administrative reception;
- T1 = time from entering the AILN (reception) to entering the unloading ramp;
- T2 = time required for unwrapping;
- T3 = time between unwrapping and unloading;
- Ƭ3 = time required for physical reception (label editing and labeling);
- T5 = waiting time for confirmation of reception;
- T6 = time spent in the AILN after confirming reception until exit;
- T7 = total time spent in the AILN;
- ϒ = labeling time;

• Ꞇ2 = time required for unloading; • β = time required for unpacking
• T4 = time required for wrapping;

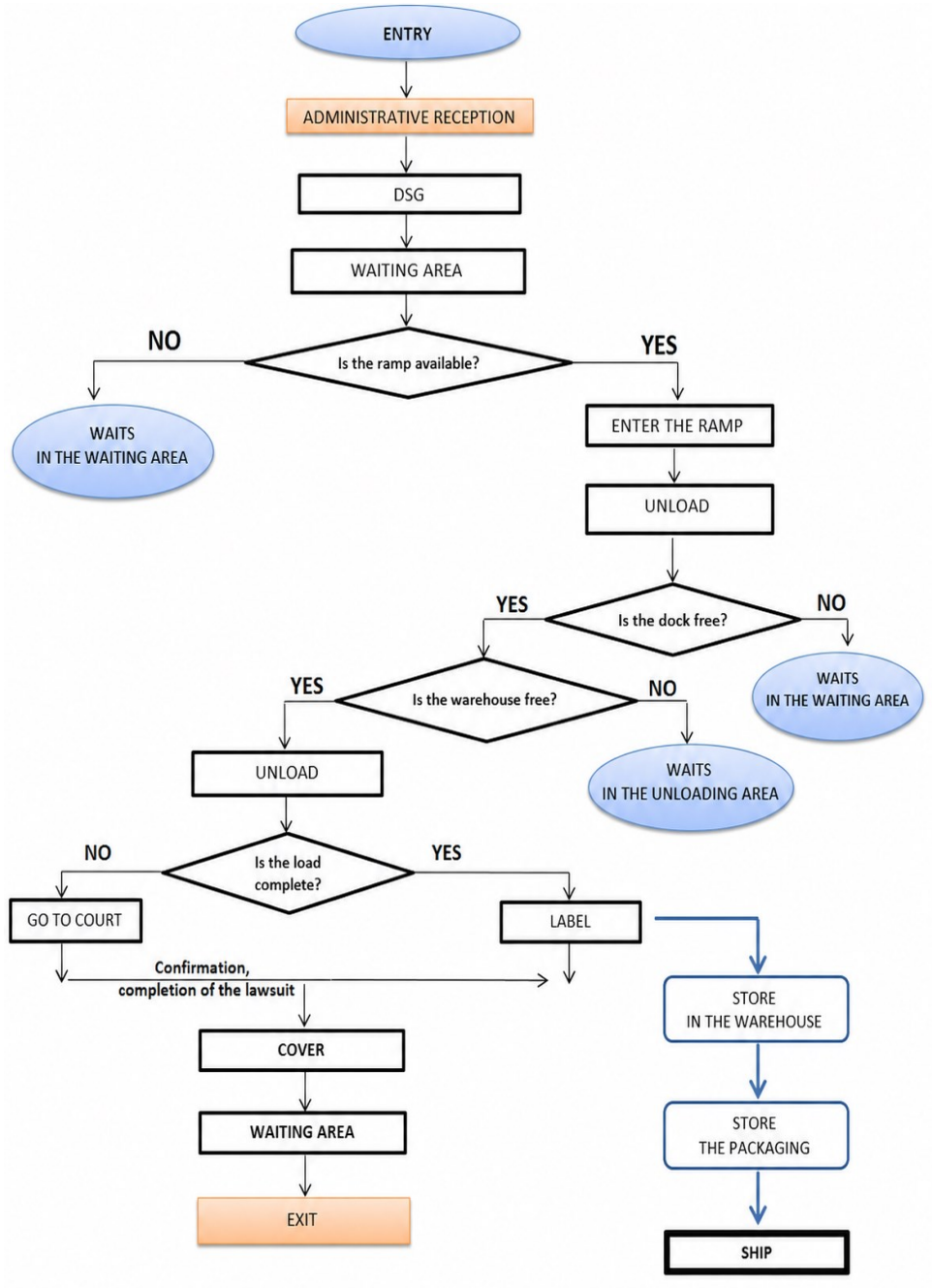


Fig. 5. Logistics process flow chart

The purpose of the analysis is to find and reduce the causes that lead to long waiting times, implicitly to high costs, in order to maintain a continuous flow of goods reception and dispatch.

Within AILN, an average of 160 trucks enter/day. For the reception of goods, there are 10 unloading ramps, open, unloading 5 logistics operators (Fig. 6). One ramp is not currently in use. After unloading the goods, labeling is carried out, followed by unpacking.

Fig. 6. Physical truck reception area

Trucks received at AILN are loaded with different packages (Fig. 7), depending on the transit flows, packages distributed differently in the truck. Each package specific to each flow influences unloading, labeling and destocking differently. This chapter analyzes the parking times of trucks loaded differently, depending on the transit flow.

Fig. 7. Types of packaging

Analysis of the parking times of trucks loaded with flow 1M packaging

The results obtained from the timing of trucks loaded with flow 1M packaging are summarized in the Table 1.

Table 2. Flow 1M results

	τ1	*T1*	*T2*	*T3*	*τ2*	*T4*	*T5*	*T6*	*Total*
Time (h)	00:17	00:36	00:12	00:06	00:23	00:05	00:47	00:21	02:50
Proportion	10%	21%	7%	4%	14%	3%	28%	13%	100%

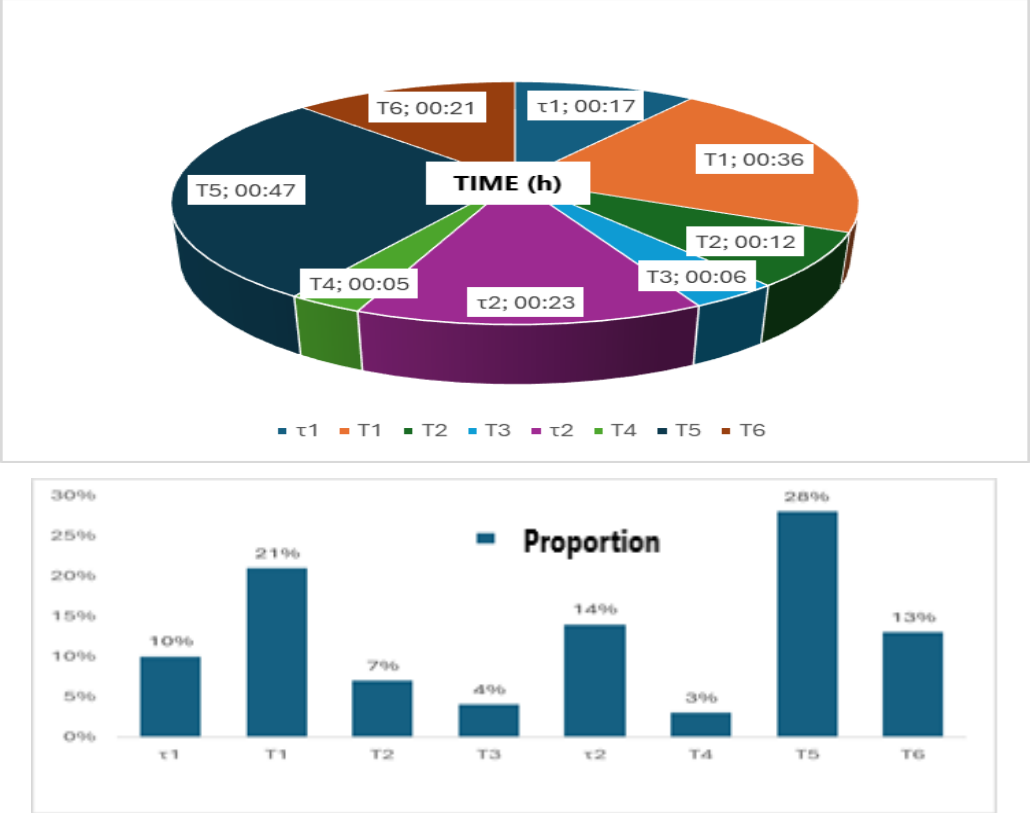


Fig. 8. 1M flow results

Fig. 8 shows the main causes leading to long parking times for trucks loaded with 1M flow packaging.

These are:

- long time to confirm physical receipt (T5);

- parking in the waiting area, because there are no free ramps for unloading;

- unloading time.

Analysis of parking times for trucks loaded with 2M flow packaging

The results obtained from the timing for trucks loaded with 2M flow packaging are summarized in the Table 2.

Table 3. Flow 2M results

	τ1	**T1**	**T2**	**T3**	**τ2**	**T4**	**T5**	**T6**	**Total**
Time (h)	00:40	00:40	00:12	00:19	00:39	00:04	01:46	00:35	04:55
Proportion	14%	14%	4%	6%	13%	1%	36%	12%	100%

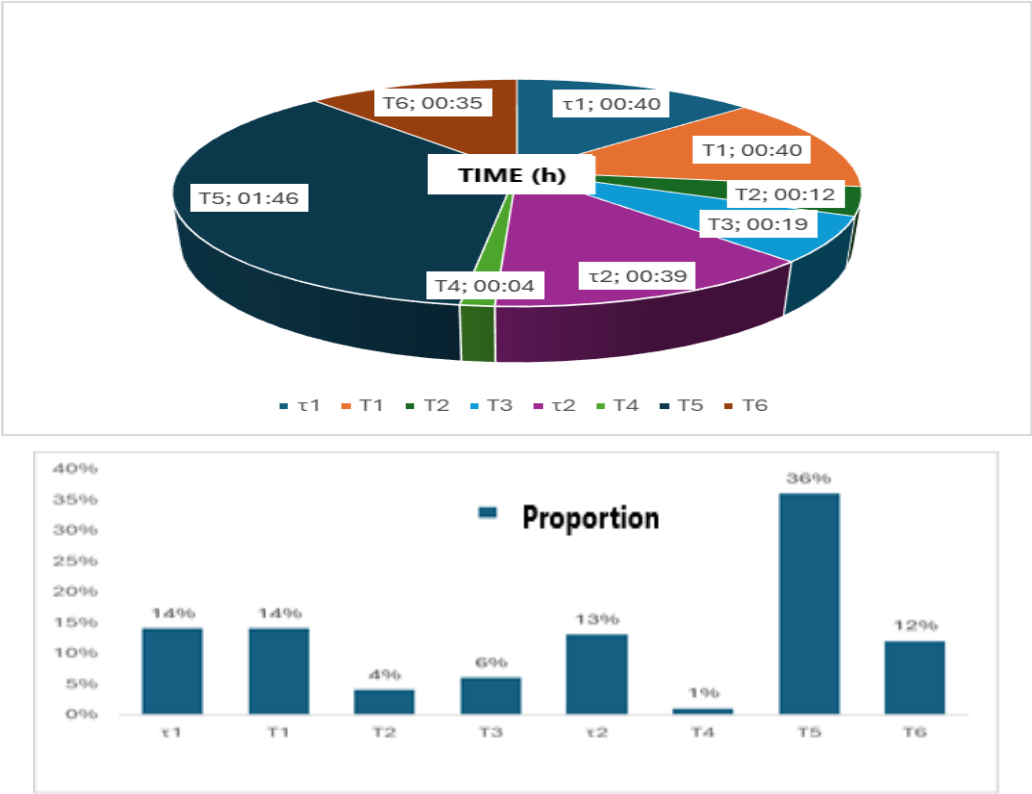


Fig. 9. 2M flow results

Fig. 9 shows the main causes leading to long waiting times for trucks loaded with 2M flow packaging.

These are:

- 36% the time to confirm physical receipt (01:46 h). This is due to the long time to sort on pallets and label 2M packages, by country, station and week;

- the time to perform administrative reception, because each reference on the delivery note is checked.

Analysis of waiting times for trucks loaded with 3M flow packaging

The results obtained from the timing for trucks loaded with 3M flow packaging are summarized in the Table 3.

Table 4. Flow 3M results

	τ1	**T1**	**T2**	**T3**	**τ2**	**T4**	**T5**	**T6**	**Total**
Time (h)	00:05	00:13	00:04	00:12	00:14	00:03	00:14	00:22	01:29
Proportion	6%	16%	4%	14%	16%	4%	17%	25%	100%

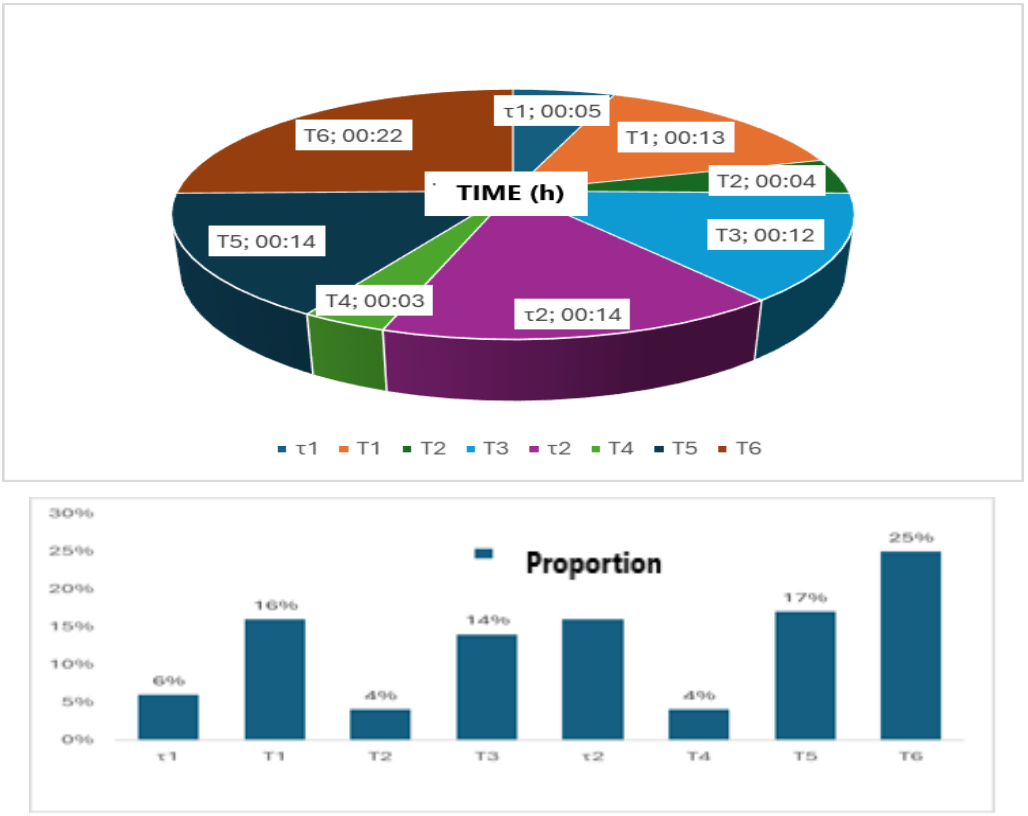


Fig. 10. 3M flow results

Fig. 10 shows the main causes that lead to long parking times, in the case of trucks loaded with packages for the 3M flow.

These are:

- the time to confirm physical reception;

- after completing the quantitative and qualitative verification of the packages, their labeling and confirmation of the documents, the truck remained inside the AILN in the waiting area, thus blocking the area for approximately 20 minutes.

Analysis of parking times of trucks loaded with groupage

We define a truck loaded with groupage (Fig. 11) as a truck loaded with packages for the 1M flow and the 2M flow.

Figure 10 shows the main causes that lead to long parking times, in the case of trucks loaded with packages for the 3M flow.

These are:

- the time to confirm physical reception;

- after completing the quantitative and qualitative verification of the packages, their labeling and confirmation of the documents, the truck remained inside the AILN in the waiting area, thus blocking the area for approximately 20 minutes.

Analysis of the parking times of trucks loaded with groupage

We define a truck loaded with groupage (Fig. 11) as a truck loaded with packages for flow 1M and flow 2M.

Fig. 11. Truck loaded with groupage

The results obtained from the timing of trucks loaded with groupage are summarized in the Table 4.

Table 5. Groupage results

	τ1	**T1**	**T2**	**T3**	**τ2**	**T4**	**T5**	**T6**	**Total**
Time (h)	00:29	00:32	00:05	00:03	00:25	00:08	00:47	00:25	02:58
Proportion	17%	18%	3%	2%	14%	5%	27%	14%	100%

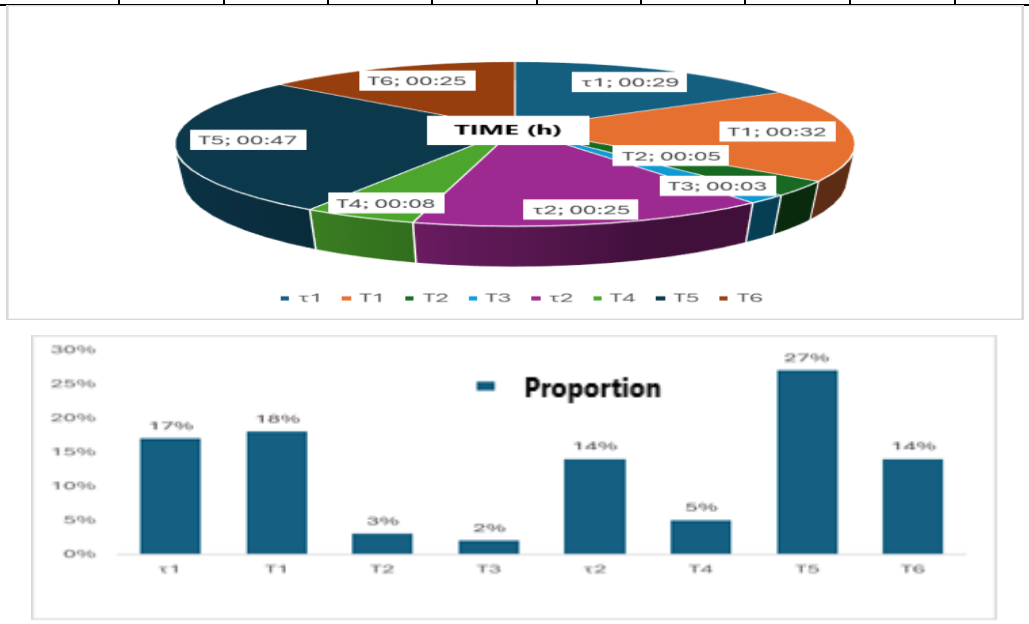


Fig. 12. Grouping results

Fig. 12 shows the main causes that lead to long parking times for trucks loaded with groupage.

These are:

- in a proportion of 27% the time to confirm physical reception (00:47 h);

- the time to carry out physical reception;

- DSG control.

- **Reducing truck parking times within AILN**

For the causes found following the analyses and determinations, the following solutions are proposed to improve the truck parking times within AILN:

✓Use of ramp five, resorting to redevelopment of the space.

✓Loading trucks from the supplier separately on unloading stations (DACIA and AILN) – solution that reduces unloading time

✓An extremely important solution that will greatly reduce the truck parking time, accounting for 40% of it, is reducing the number of disputes. For this, suppliers must be encouraged to reduce the number of quantitative and qualitative disputes.

✓The seal should be checked at the gate by DSG – solution that helps the staff at the physical reception and reduces the time for carrying out the reception and confirming the documents.

✓It is proposed to build an area for uncovering/covering trucks – solution that leads to the rapid release of the ramps after unloading.

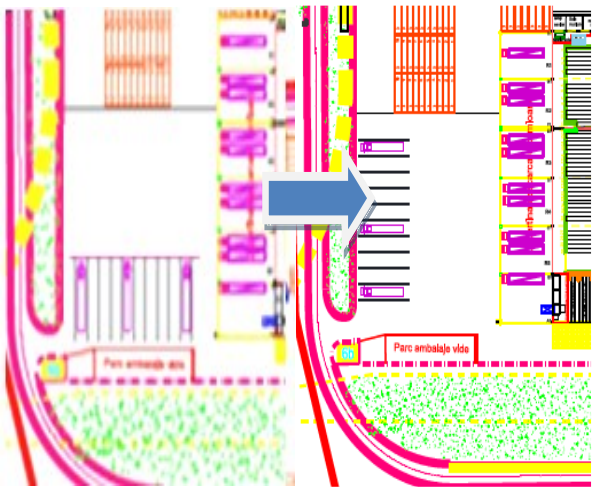


Fig. 13. Waiting area

By creating a truck stripping and covering area, the waiting time at the ramp is reduced by approximately 7 minutes/truck.

- ✓The waiting area should be located in front of the unloading ramps (Fig. 14), to reduce driver maneuvers - a solution that helps reduce parking time.
- ✓Reducing the number of emergencies or airings and avoiding alerts, meaning that the cargo needs must be covered.

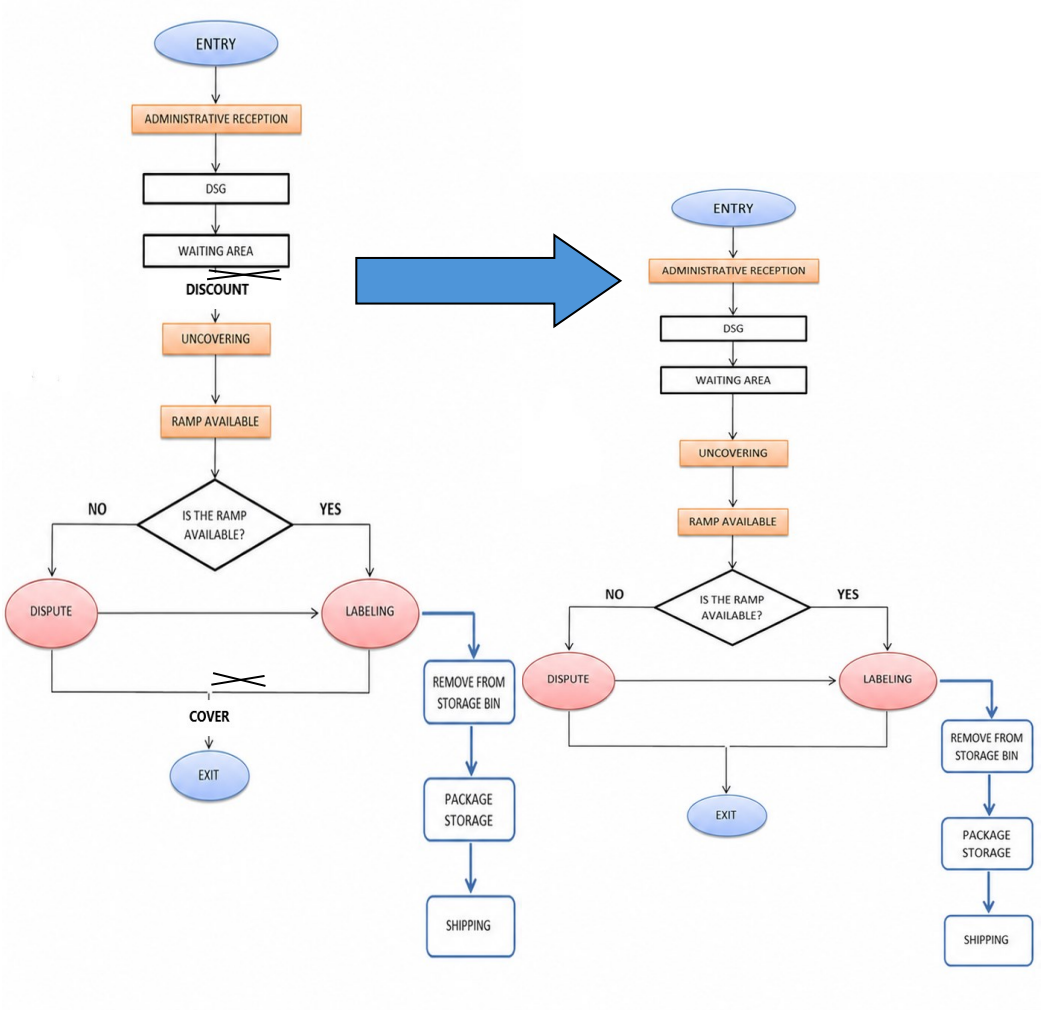


Fig. 14. Flows considering waiting area in front of the unloading ramps.

During the period January – April 2026, the cargo volumes received are detailed in the Table 5 and Fig. 15.

Table 6. Volumes received January – April 2026

S	S44	S45	S46	S47	S48	S49	S50	S51	S52	S02	S03	S04	S05
m^3	27345	27294	24630	16715	11518	17559	19052	27431	36559	38551	37927	38345	26358

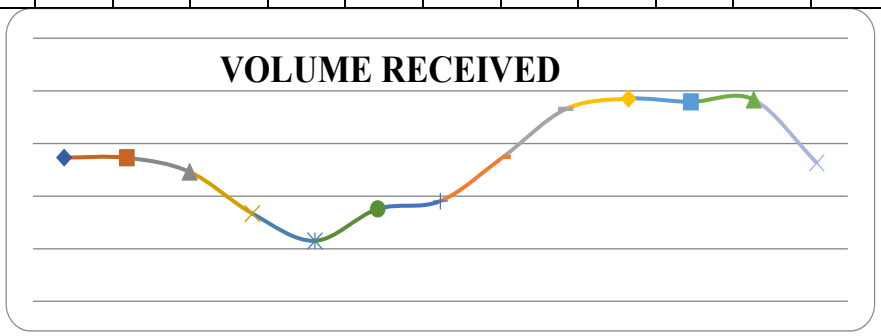


Fig. 15. Graph with volume of goods received **m^3**

During the study period, trucks were delayed in unloading in the Entry Circuit (IC) regime, due to the number of trucks in ADVANCE and DELAY (Fig. 16).

Table 7. Trucks parked at the entrance to AILN

Week	S45	S46	S47	S48	S49	S50	S51	S52	S02	S03	S04	S05
Trucks	2	8	3	0	1	3	2	30	27	28	31	18

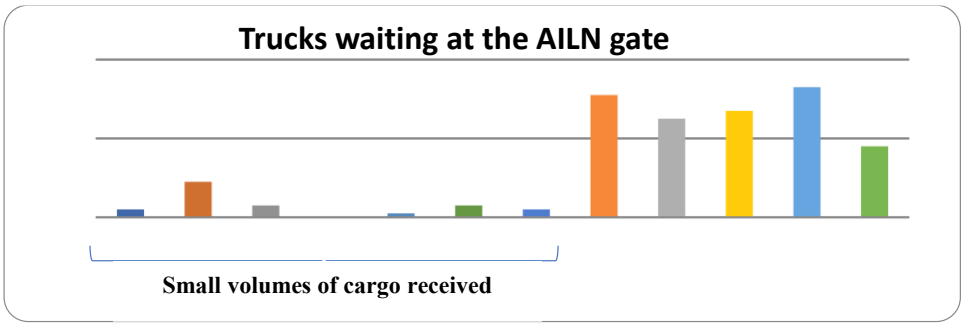


Fig. 16. Trucks parked at the entrance to AILN

At the road station, trucks were unloaded in the order of arrival at the road station and emergencies, without following the time and date scheduled for unloading on the Traffic Sheet, unloading OTs in advance. This led to delays for trucks on the circuit that remained on the circuit that remained waiting in the Parking Lot.

To improve the parking times of trucks on the circuit, the following solutions need to be implemented:

- Identification and prioritization of delayed circuit trucks;
- Emergency unloading of delayed trucks in CI mode;
- Reorganization of truck planning in road stations based on volumes;
- Reduction of the number of trucks in OT, emergency and accelerated mode;
- Reduction of the number of trucks in OT mode and their transition to circuit mode with unloading on working Saturdays.

- **Conclusions**

The analysis carried out highlights the fact that truck parking times represent an essential indicator of the performance of the logistics system, having a direct impact on the operational efficiency and on the total costs of logistics flows.

The results obtained indicate that the main factor generating significant delays is the time related to the confirmation of physical receipt (T5), which has a major share in the structure of the analyzed times, especially in the case of complex logistics flows.

Relevant secondary causes were also identified, such as limited operational processing capacity, inadequate organization of truck arrivals, long duration of labeling and sorting operations, the existence of operational disputes and the lack of an effective correlation between the planning and execution of logistics activities.

A critical factor is the insufficient existing unloading capacity, which generates additional blockages and waiting times in operational areas. In this regard, it was found that the implementation and use of a fifth unloading ramp (or reorganization of the type of operational "station") would significantly contribute to increasing processing capacity and reducing dwell times.

The comparative analysis of logistics flows highlights the fact that the degree of complexity of packaging and operations directly influences the total duration of dwell times, with the 2M type flow recording the highest delay values.

Overall, it is found that optimizing dwell times requires an integrated approach, based on streamlining operational processes, improving planning, increasing the degree of digitalization and expanding physical unloading capacity by implementing a new operational ramp.

Own contributions:

- ✓ Conducting a detailed analysis of the downtime by breaking down the logistics processes into operational stages;

- ✓ Identifying the main causes of delays and bottlenecks in the logistics flow;
- ✓ Structuring and using relevant performance indicators to evaluate the efficiency of logistics processes;
- ✓ Highlighting the critical points that directly influence the duration of operational flows;
- ✓ Conducting a comparative analysis between the different types of logistics flows;
- ✓ Correlating the type of packaging and the complexity of operations with the duration of downtime;
- ✓ Substantiating the need to expand operational capacity by implementing a fifth unloading ramp / reorganizing the station-type infrastructure, as a solution to reduce logistics bottlenecks;
- ✓ Proposing practical optimization solutions aimed at reducing downtime and increasing operational performance.

The paper highlights the fact that truck parking times are a determining factor in the efficiency of logistics processes, directly influencing the continuity of operational flows and the level of costs.

The analysis carried out allowed the identification of the main causes of delays, such as the long duration of reception processes, operational capacity limitations and the lack of efficient synchronization between the stages of the logistics flow.

Based on the results obtained, optimization directions are proposed aimed at digitalizing processes, reorganizing activities and expanding unloading capacity by implementing a new operational ramp, an essential element for reducing bottlenecks.

The implementation of these measures contributes to the significant reduction of parking times and ensuring a continuous, stable and predictable logistics flow.

R E F E R E N C E S

[1] Bălan, Carmen (2006). *Logistics*. Bucharest, Uranus Publishing House;
[2] Ballou, Ronald H. (1992). *Business Logistics Management*; Prentice Hall, Englewood Cliffs;
[3] Dima I.C, Man M.(1999). *Industrial Activity Management*. Bucharest; Romanian Academy Publishing House;
[4] Dima I.C, Man M.(1997). *Company Logistics System*. Bucharest; Technical Publishing House;
[5] Duchamp, M. (2013). *Standard logistique flux internes*; Descriptif et Fonctionnement d'une gare routière, 4-7, 11-17, 22-25;
[6] Ristea Ana-Luci, Purcărea Th., Tudose C. (1996). *Goods Distribution*; Bucharest; Didactic and Pedagogical Publishing House, "Virgil Madgearu" National Institute;

[7] Naşcu Ioan (1999). *Management of Transport Services*; Bucharest, Sylvi Publishing House;
[8] Venturelli Nadine, Miani Patrick (2010). *Logistics Transport. The genius of glaciers*; Educational innovation;
[9] http://biblioteca.regielive.ro/cursuri/transporturi/logistica-depozitarii-marfurilor-35862.html
[10]http://biblioteca.regielive.ro/cursuri/logica/suport-curs-logistica-47731.html?s=logist