Report about the analysis of freight train waiting time at Curtici – Lőkösháza border crossing

Foreword

On the initiative of Mr Matthieu Grosch, the European coordinator of EU Core Network Corridor Orient / East-Med the ministries of the corresponding rail freight corridor laid down in a joint memorandum the objective to decrease the waiting time at rail border crossings. The document, which was signed on 21 June 2016, sets the target at 120 minutes. In the year of the signature, there were only few of the around dozen border crossings which complied with this criterion, predominantly those with light traffic. Today, the majority of them can report about having successfully lowered the average waiting time to below the target.

The objective itself was selected by the European coordinator from among the comments received during a customer meeting in November 2015. Already then, the comments addressed the waiting time experienced at the border crossing Curtici–Lőkösháza, and this border crossing has remained in the focus of the customer requests. Despite the efforts made, the target of 120 minutes could still not be achieved here, and only moderate advancing can be observed.

At the same time, the traffic at the border crossing increased significantly, it surpassed from 2016 onwards the average of the previous years by around 40%. Albeit the expected improvement in quality parameters could not be achieved, the quantity parameters, the output grew considerably.

What main reasons can lengthy dwelling at the concerned border crossing be ascribed to? Compared to the other border crossings on Rail Freight Corridor Orient / East-Med (RFC OEM), that border features by far the heaviest traffic among those located at a Schengen border. That is its unique attribute, and is thus likely to be a determining factor. The present document, though, is treating this attribute as a fixed parameter, it doesn't analyse the effects of its modification.

From the point of view of interoperability, the differences are moderate (train control system). Additionally, some operations rules have been different on the two networks (e.g. buffer wagons), although the concerned Member States have made efforts recently to deregulate these.

Work for reducing the waiting time started at each border crossing of Orient / East-Med Rail Freight Corridor in similarly organised platforms: a task force was established, which was supposed to involve all stakeholders from the sector, that is, apart from the two infrastructure managers also the rail safety authorities and – on a voluntary basis – the railway undertakings. Coordination of the work has been done by that infrastructure manager, whose network the handover (interchange) station is located on, in this case, CFR. The task force of Curtici is regularly having meetings, eight plenary ones have taken place since its establishment in 2017.

At the same time, infrastructure development activities of the two concerned infrastructure managers have also made an effect on the matter. Reconstruction works at Curtici station have finished, and the border crossing shall be equipped with two tracks soon. Moving towards operations, the two infrastructure managers have introduced a border IT-system (IMComm), which serves to submit in a structured and transparent way the data arisen at the railway undertakings about cross-border train traffic. Regular (quarterly), high-level traffic management coordination sessions have started between the two infrastructure managers, and the dispatching unit has been given additional resources.

In spite of the measures already taken, the reduction of the waiting time is yet to reach the expected target, and the spokespersons of the railway undertakings of Rhine – Danube and Orient / East-Med Rail Freight Corridors requested further measures via a common letter submitted on 12 February 2021. With the ministries actively joining the common work has continued.

Even though the Schengen border to be crossed and the border control, as main attribute and a potential driving factor for waiting time had already been recognised before, analyses have so far not gone beyond the rail sector, have not considered the processes of the border control authorities. The importance of a factor that is not examined thoroughly can be easily over- or underestimated. Therefore, a meeting was held on 17 March 2022 together with the foreign affairs and internal affairs authorities of the two concerned Member States, where MÁV Zrt. was requested to undertake a new analysis that involves these factors as well.

The present study is examining the processes of the infrastructure managers and railway undertakings at the border crossing more in details than ever, and also attempts to map the interaction with the border control processes.

Preparation and data collection

Before starting the analysis, it was necessary to define the fields and data types whose availability can be ensured, and which may have an effect on the waiting time experienced by the freight trains crossing the border. All criteria have been gathered which are necessary for the operation of the trains.

In that context, a test for the data collection was carried out in the first week of May 2022 together with the infrastructure managers (CFR and MÁV). The results thereof showed that involving the railway undertakings into the data collection would be essential, so that a complete overview of the problems could be drawn up.

As a next step, all stakeholders were contacted (infrastructure managers, railway undertakings, terminal operators) and invited to participate. At the coordination meeting the dataset to be collected was defined commonly, together with the duration and period of the data collection. It was set as objective not to look for data beyond those that are essential for the analysis, not to set a data collection period being too long, yet to ensure the representativity of the subset. It was assumed that if the duration of data collection is appropriate for the railway undertakings, then the number of involved data sources can be increased, which allows a more detailed and reliable analysis of the matter.

Data can be classified into two groups depending on their availability:

1.) Continuously available data:
- train arrival time,
- train processing duration,
- starting time and duration of border control process
- train departure time
- departure and arrival times for operations to and from Railport Arad (Curtici terminal)

These data are available at the infrastructure managers and the terminal operator, they can be accessed any time.

2.) Not continuously available data:

- various data that is managed by the railway undertakings, and which might have an effect on cross-border train traffic:
    - time of handover at the interchange station (Curtici)
    - time of submitting the message 'train is ready to run'
    - arrival time of locomotives and drivers
    - time of brake test
    - obstacles (loading rules, lack of RID conformity, technical problems)

  These data can not always be traced back.

Criteria for the running of freight trains:

- appropriate infrastructure (track, signalling, traffic management staff, energy supply)
- appropriate hauling (tractive unit)
- appropriate human resource (appropriately qualified driving and shunting crew)
- conformity to loading rules
- if necessary, conformity to RID provisions
- appropriate condition of vehicles (able to complete transport tasks)

Before the data collection, the following coordination meetings were held in order to exchange information:

- 7 June 2022: video conference was held with the representatives of the concerned railway undertakings, Railport Arad (Curtici terminal) and the infrastructure managers about the time, duration and contents of the data collection. The period of data collection was agreed for 4–11 July 2022.
- 22 June 2022: the commonly agreed data collection sheet was circulated among the railway undertakings and infrastructure managers.
- 29 June 2022: the commonly agreed data collection sheet was submitted for the stationmaster of Lőkösháza.
- 13 July 2022: request for information about the outcome of the data collection was sent to the representatives of MÁV and CFR.
- 15 July 2022: the completed data collection sheet was submitted by the representative of MÁV.
- 20 July 2022: request for information was sent again for the representative of CFR.
- 21 July 2022: the representative of CFR informed that between 4 and 11 July 2022 (the initial data collection period agreed on 7 June 2022) data collection was not accomplished. CFR announced unilaterally that it would carry out data collection between 25 and 31 July 2022.
- 22 July 2022: question was sent to the representative of CFR, whether ex post data collection would be possible with regard to the continuously available nature of the concerned data.
- 2 August 2022: the completed data collection sheet was submitted by CFR for the period between 25 and 31 July 2022, which was defined unilaterally.
- On the same day, the representatives of the railway undertakings, Railport Arad (Curtici terminal) and MÁV were notified and were asked to send data for the period between 25 and 31 July 2022, in case it is available.

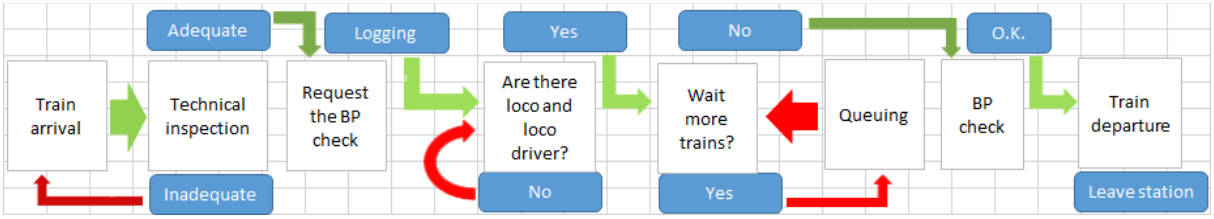
With a view on CFR not having accomplished the data collection for the initially agreed period, all other stakeholders were requested a second, ex post data submission. The success thereof stayed limited,

as most stakeholders did not have the resources necessary for carrying out a second data collection, with the exception only being MÁV.

The analysis was further hindered by the limited number of railway undertakings which cooperated in the consultation. Merely 4 railway undertakings carried out the collection and sent data, and all but one of the datasets lacked a detailed description of problems. The factors assigned to the railway undertakings which contribute to the waiting time, could thus hardly be revealed. All submitted datasets applied for the initial period between 4 and 11 July 2022, no data could be submitted about the period, when CFR carried out its data collection.

Process description

The different phases of train processing at the handover station are illustrated in the figure below:



Steps of train management in Curtici:

	Event:	Operator:	Comment:
1.:	The train arrives at the station	Transferring RU	Locomotive and locomotive crew change
2.:	Technical inspection	Transferring/recipient RU	Checking the technical condition of the wagons, compliance with RID, compliance with the loading rules, presence and integrity of security seals. The responsibility for remedying any deficiencies or defects lies with the transferring railway undertaking.
3.:	Request for border police check	Recipient RU	If everything has been found to be ok and there are no obstacles to the train's running
4.:	Availability of locomotive and locomotive crew	Recipient RU	If any of them is missing this check cannot be started.
5.:	Are there other trains which are waiting for inspection?	Border police	If there are other trains waiting for inspection, it has to wait for their completion
6.:	Border police check	Border police	
7.:	Train departure	Signaller	The prerequisite is that Lőkösháza station grants movement authority

CFR and MÁV manage the movement of trains on the border section according to the following procedure:

- Every 6 hours, MÁV sends to CFR the train numbers of those trains which apply for border crossing at Curtici (which trains are on their way to the border).
- CFR sends feedback to MÁV about which are the trains that are allowed to advance to Curtici, and in what sequence is their arrival foreseen.
- Based on the feedback received from CFR, MÁV will run the trains to Lőkösháza according to the order requested by CFR.
- Granting movement rights for trains coming from Curtici to Lőkösháza always requires prior approval by the Hungarian border police.
- The border control inspection of trains takes place both in Curtici and Lőkösháza, which in addition to the examination of the assembly and cargo also covers the inspection of persons (crew).

The evaluation was based on data provided by IMs (CFR, MÁV) in such a way that the train processing phases at the station were processed in chronological order per train for the whole study period. That allowed to separate the time required for each phase and to determine the stakeholders whose activity is linked to each timespan.

There are two conditions for the border police to start checking a freight train:

- the locomotive must be coupled to the train

- the driver must be on the locomotive

Two other important rules may also affect the date of the inspection:

- The validity period of the check is 1 hour. If the train does not leave the station within 60 minutes, a new inspection must be carried out.

- At least two guards must supervise the train until departure after the check has been completed, one guard per side.

The communication chain is following:

1. After the handover procedure is completed, the representative of the railway undertaking informs the signaller that the train is waiting for border control.

2. The signaller shall inform the border police when the preconditions for the check have been met.

Hours can pass between the two steps. Railway undertakings may request border control at any time after the end of the handover procedure. This means that the request may be submitted even if none of the preconditions for the border police to start the inspection are met. Completion of the handover procedure, which is the only condition for requesting a check, does not necessarily mean that the locomotive is attached to the train and that the driver is on board.

If we used the recorded times of inspection requests from railway undertakings to compile statistics on how long it takes for the border police to start an inspection based on the request, it would give a distorted picture of the situation. The waiting time for the check would show a much higher value than the actual value, it could make us to believe that the missing border police check is the main reason why the trains waited at Curtici station, while in reality, according to the dataset, at the time of the request, the locomotive and the driver are both missing.

On average, the waiting time for the border police check was 146 minutes, and the total waiting time for the check was 168 hours during the one-week data collection period. But these values are only theoretical maximums, since there is no data available about the time of the locomotive's coupling and the driver's arrival. Due to the previously described prerequisites, these would be absolutely necessary for preparing adequate statistics on the waiting time for the border guard inspection.

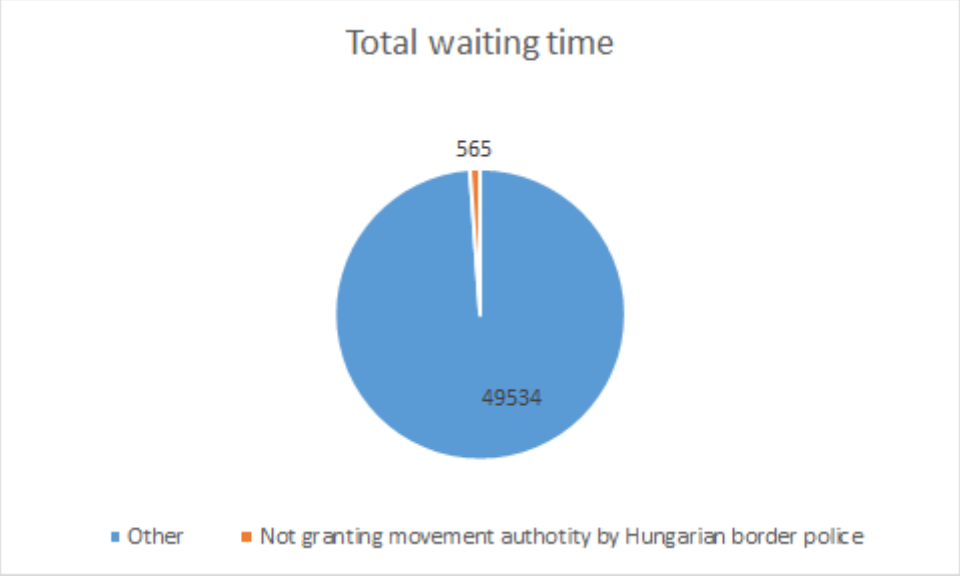
Currently, taking into account the volume of train traffic in Curtici, the number of border guards is sufficient for one shift. However, if traffic increases after the construction of the second track, the number of police officers inspecting the trains could be a bottleneck. It is therefore necessary to closely monitor the amount of freight traffic, and increase occurs, it may become necessary to grow the number of police teams and personnel.

Due to the migratory pressure on Hungary, a new version of the rulebook governing the procedures at Lőkösháza border crossing was adopted in 2017, which also gives the police commander in Lőkösháza the right to reject to grant movement authority for freight trains from Curtici station in certain cases.

During the week of the data collection in July 2022, Hungarian police officers declined 10 times to grant movement authority for a freight train from Romania. Of these, only two led to additional waiting times longer than one hour (70 and 120 minutes), resulting in a total waiting time of 565 minutes.

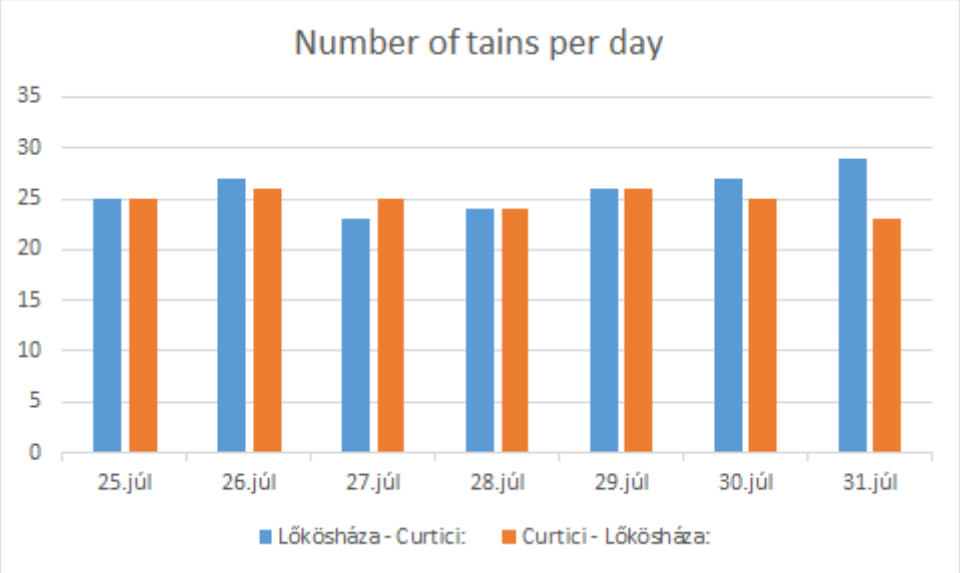
Train rejection is usually due to staff shortages, but the latest information suggests that the number of staff will increase by 12 in the coming months, so the number and average duration of these cases will also decrease. The cumulative time spent by freight trains from their arrival in Curtici to their departure for Hungary during the week of data collection was 49.534 minutes, so the delay caused by Hungarian police is negligible in comparison. Therefore, no significant positive impact can be expected from this increase in staff numbers per se.

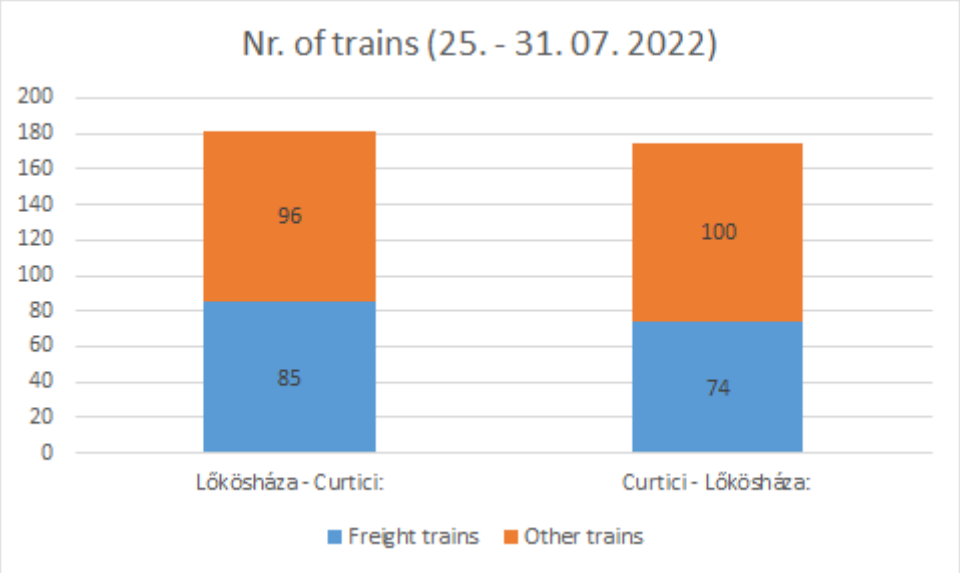
The diagram below illustrates that the number of train rejection by police officers does not play a significant role in the waiting times in Curtici.



Results

It is important to note that the results of the data processing do not express an opinion, they focus only on the facts behind the data obtained, and any bias due to discrepancies or omissions is not due to the shortcomings of the analysis. The traffic in the period under consideration was average, with no extreme outliers, and the number of trains running is in line with the average for 2021.

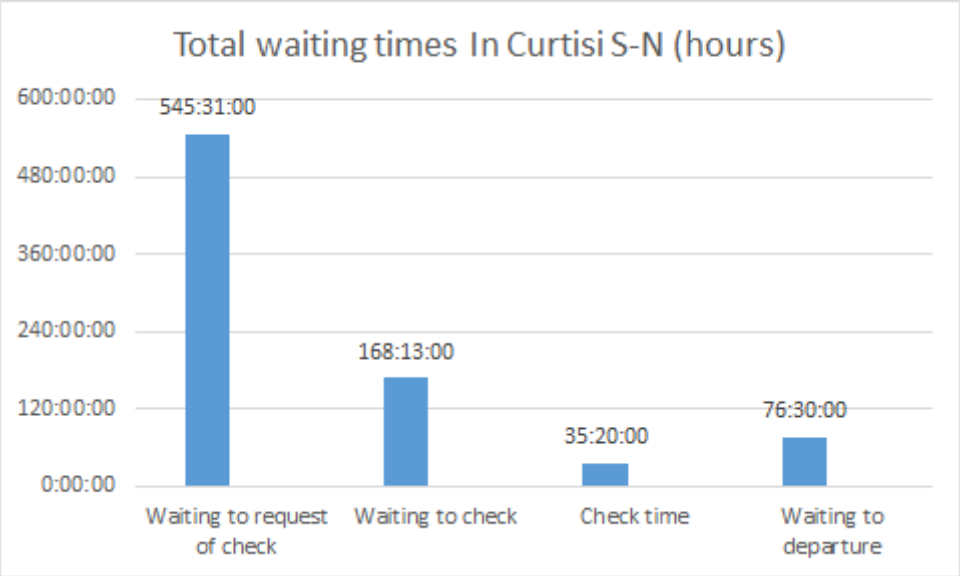


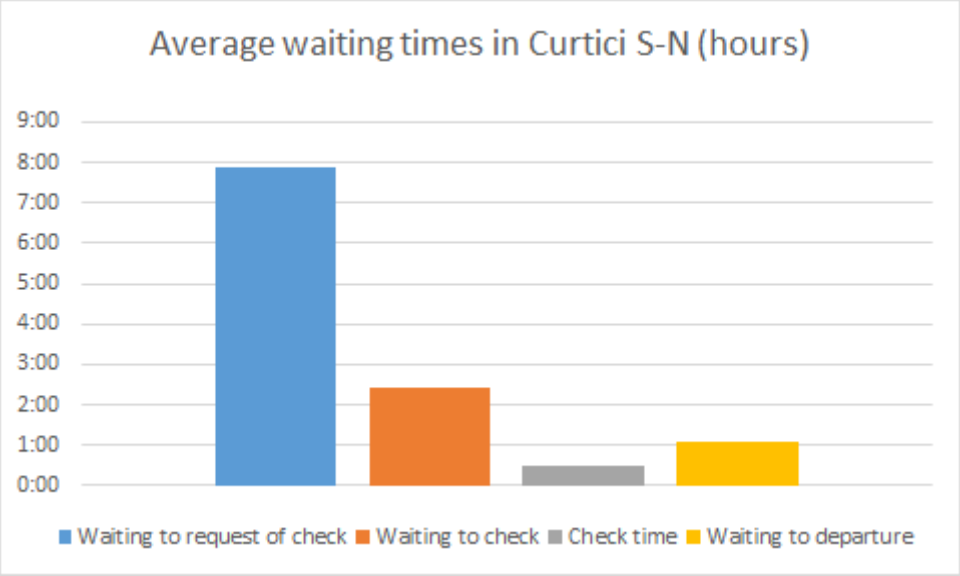


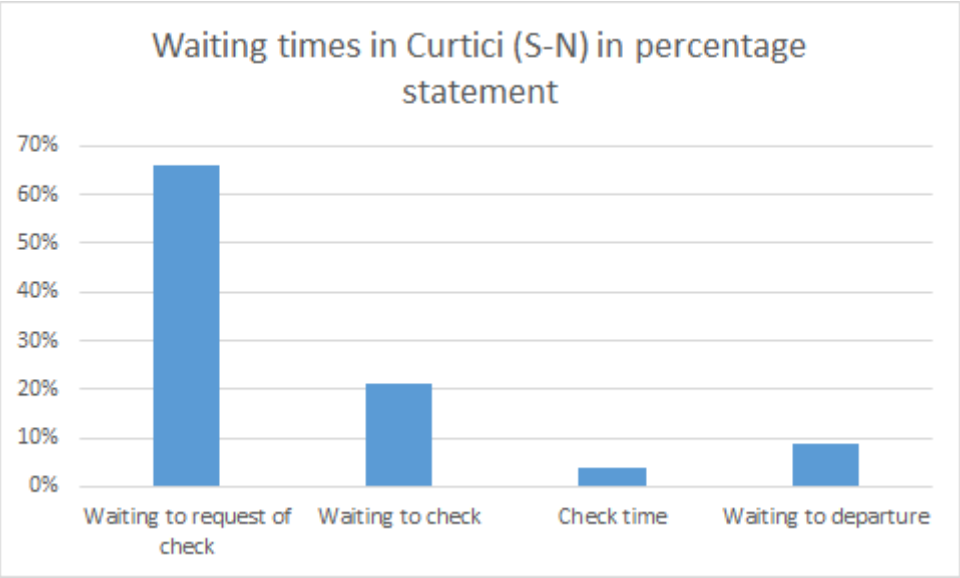
From the data provided by CFR, the following facts have been concluded:

1. Significant time elapses between the arrival of trains and the request for border police check, due to non-compliance of trains and the lack of availability of the locomotive or locomotive crew. This time is about three times longer than the waiting time for border police clearance.
2. In a number of cases there is no locomotive or locomotive crew when trains are reported for border inspection, which may cause distortion of the data.
3. When preparing for the border control, the duration of switching off the catenary system should not be neglected, which is done manually for tracks 11 to 18, with a duration of 15 to 20 minutes each time.

4. The duration of the border police checks is approximately uniform, longer, time-consuming checks are not typical, the level of the migration threat was low, and there were no illegal border crossing attempts during any of the inspection periods according to the available information.
5. After the inspection, the departure times of the trains checked do not show longer waiting times, taking into account the fact that in a significant number of cases the brake tests are also carried out after the border control.





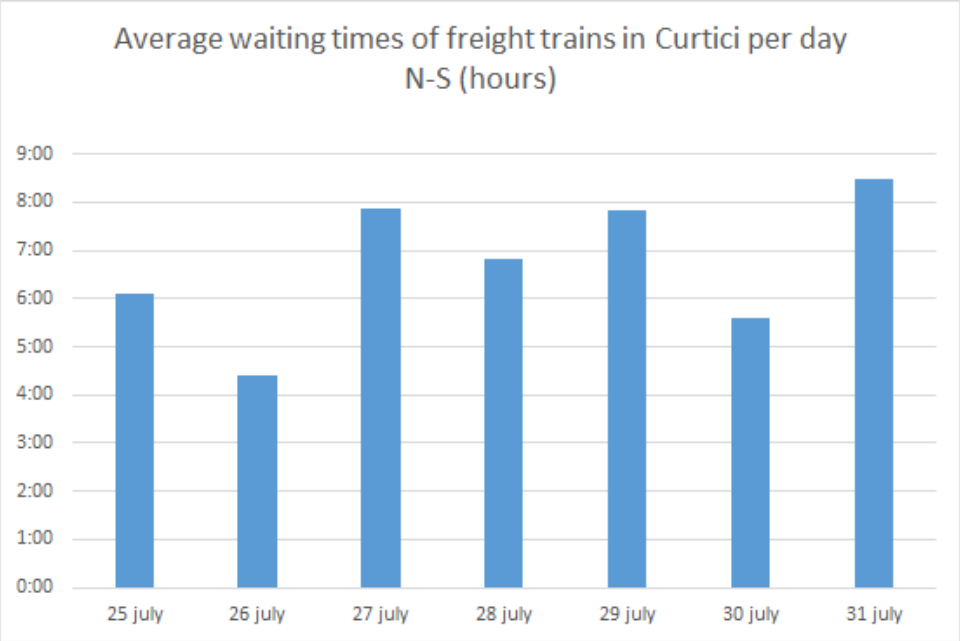


Factors that prevented trains from running on time according to railway undertakings:

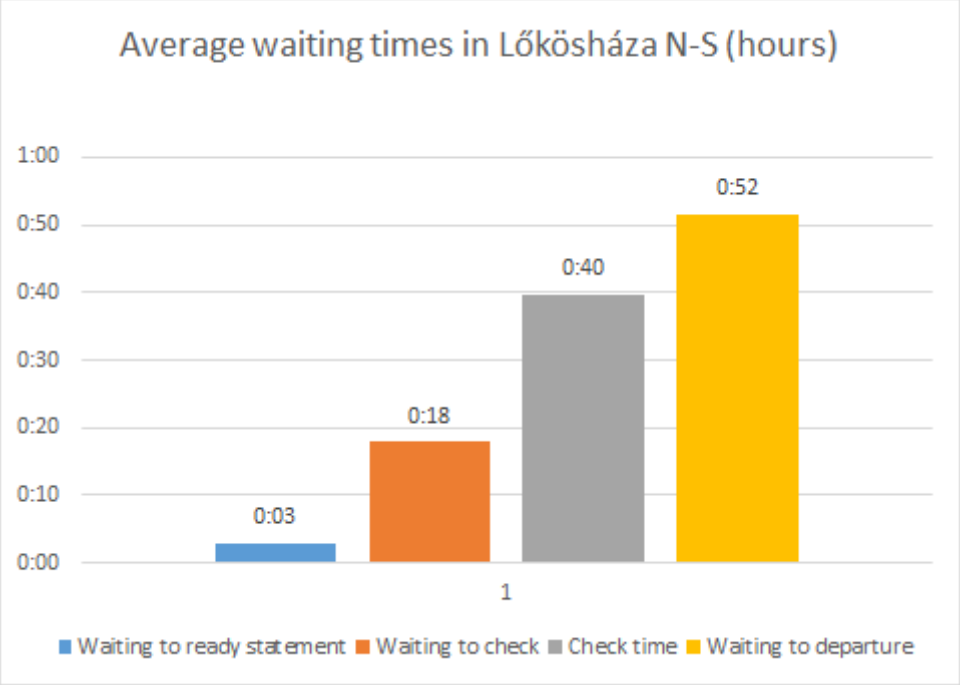
- Non-conformity with loading rules (e.g., on wagons carrying passenger cars, the wheels of the passenger cars were not or not properly wedged)
- RID non-compliance: all regulations concerning the transport of dangerous goods must be complied with and their implementation is strictly monitored by the competent authorities in Hungary.
- Technical faults: various technical defects of the wagons, the repair of which is necessary for the train to continue running.

Other factors may also hinder the acceptance of trains, but as we have detailed information on only about 20 of the 100 freight trains that have been dispatched, we do not have further details.

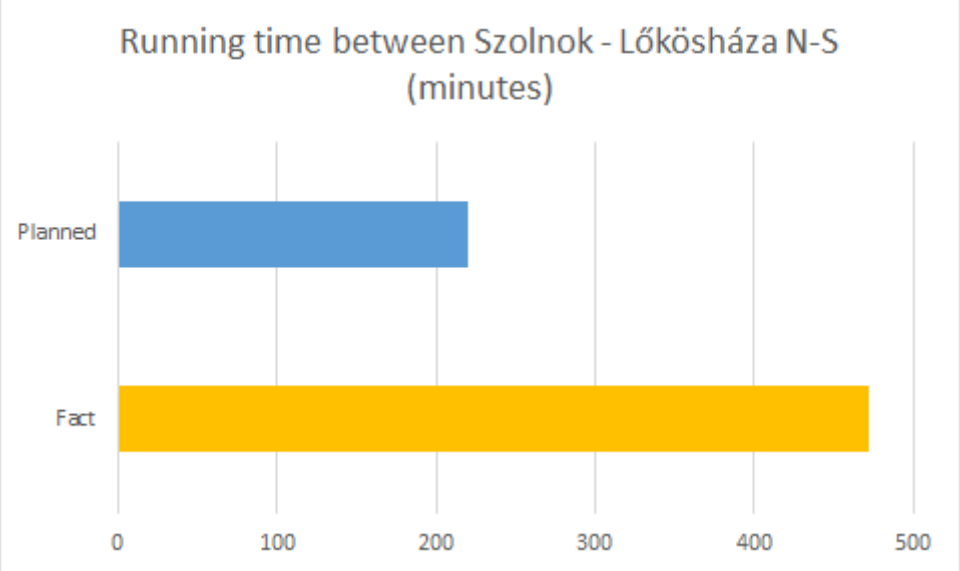
These problems arise on the Curtici - Lőkösháza route. We have not received information on why trains in the opposite direction are waiting longer at Curtici station, despite the fact that trains from Hungary are not subject to the same strict border control as trains to Hungary, because the migrant issue is more applicable towards Hungary.

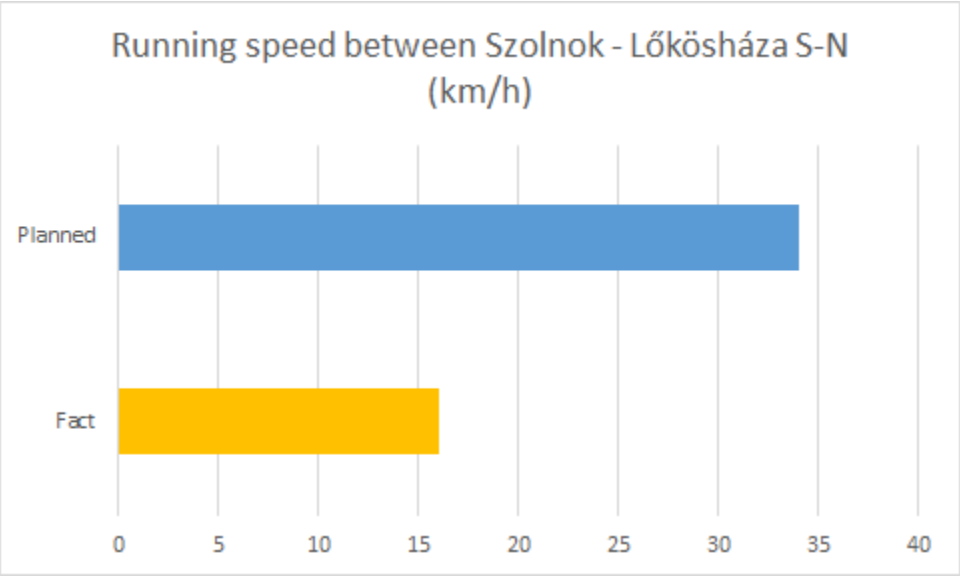


In Lőkösháza, transit times show significantly lower values, which is because the handover does not take place in Lőkösháza, so the trains arriving here do not need to wait for a locomotive or staff. At the same time, more significant congestion may develop in the interior of the country as far as Szolnok, because the Romanian traffic centre decides which trains may advance to the border.



As shown in the figure below, on the section between Szolnok and Lőkösháza there is significant difference between planned and actual journey times and the planned and actual speed of trains, with actual journey times and speeds being less than half of the planned values.





PROPOSALS:

For railway undertakings:

1.) Railway undertakings should consistently require compliance with loading rules before train handover, and to refuse to accept a train if a defect or deficiency is detected
2.) Railway Undertakings should consistently require compliance with all the requirements of the Regulation concerning the carriage of dangerous goods (RID) before train handover, and to refuse to accept the train if a defect or deficiency is detected
3.) Railway undertakings should make efforts to the wagon owners to make the wagons available in a condition suitable for the transport operation, if necessary, ensuring that technical faults are repaired quickly and professionally.

By following these recommendations, it will be possible to ensure that problems arising in this connection do not have to be dealt with at the interchange station, thus reducing the load on the station and facilitating smoother train movements.

For infrastructure managers:

1.) We consider it necessary to clearly describe in the local regulations in Curtici the individual processes and their implementation and requirements, since to our knowledge the sequence and administration of activities from the arrival of trains to their departure are not precisely defined. By implementing this, traceability can be increased, which can greatly facilitate responses to any obstacles that may arise.
2.) The ongoing development work will improve the permeability of the border section, allow traffic to flow more smoothly and, once the second track is built, any maintenance work will no longer result in a complete closure of the section, thus maintaining the permeability of the border section.

For railway undertakings and infrastructure managers:

1.) Full compliance with, and enforcement of, the rules for reporting for border inspection, ensuring that the waiting time of trains can always be attributed to the participant who is in charge of responsibility of the train at the time. This will avoid further disputes as to whose responsibility the waiting time was.

For border police authorities:

1.) Installation of camera gates, X-ray gates, which can significantly speed up the inspection process, even allowing trains to pass through without stopping.

2.) In view of the completion of the infrastructure development works and the expected increase in traffic that this will entail, it is recommended that the border police authorities examine the need for and feasibility of increasing the number of border police officers.