Exploration Netherlands contribution to rail solidarity lanes Ukraine

Final Report

Client:
Ministry of Infrastructure and Water Management

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Contents

1 Preface: geopolitical uncertainty, volatile market

This study was commissioned in June 2022: a period experienced by many as showing the most urgent need for expanded railway connectivity between the EU and Ukraine. The latter country, belonging to the largest grain exporters worldwide, saw its Black Sea ports obstructed, its grain storages still full and the summer harvest due. As a direct result of the Ukraine crisis, significant parts of the world were at risk of food shortages. Although some volumes were seen being shipped into the EU, be it by rail, barge, or road, it was clear that these hardly constituted more than a drop in the ocean.

The resulting market and transport operational circumstances were being defined by overwhelming demand and sheer unlimited volumes, only to be met with major if diverse barriers on the European railway network. Clearly, market parties were unable to address the challenge independently, whilst the different levels of European governance were grappling with the question of what measures to take. It was under those circumstances that a preliminary set of possible measures was defined.

Shortly after, on 22 July, an agreement was reached involving the United Nations, Turkey, Russia and Ukraine on the partial reopening of the Black Sea route. We consider that the relevant implications of the agreement were threefold. Firstly, Ukrainian exports of grain through the country's seaports were partly resumed, reaching some 1.7 million tonnes in August and 3.8 million tonnes in September[1]. Secondly, as a result, previously developed railway flows carrying Ukrainian crop into the EU became more volatile. And finally, the further development of such connections was rendered considerably more difficult, even as their strategic desirability is recognized by all parties involved. Thus, market volatility, capacity and operational impediments and geopolitical uncertainties play into each other: a recurrent theme that will be apparent to the reader throughout this report.

On 29 October 2022, Moscow announced the suspension of its participation in the above mentioned agreement, the rammifications of which remain unclear at the time of writing. However, we are convinced of the strategic rationale for expanding and consolidating railway flows of Ukrainian crop into the EU – as also recently expressed by the Ukrainian government[2]. In order to achieve this, it is worth emphasizing that in our assessment a need exists for effective, targeted public intervention. It is our hope and expectation that this study will contribute to this development.

[1] See e.g.: https://www.agriland.ie/farming-news/5-5m-tonnes-of-agricultural-produce-exported-from-ukraine/
[2] See e.g.: https://i.pl/henryk-kowalczyk-trzeba-budowac-korytarze-wywozu-zboza-z-ukrainy-alternatywne-wobec-rosyjskich/ar/c1-16827433

2 Introduction

2.1 Background

In light of the ongoing Russo-Ukrainian war, the Dutch ministry of Infrastructure and Water Management required an exploration of possible (logistic) support actions for Ukraine's rail freight connectivity, especially regarding the country's agriculture exports and involving the broader Dutch railway sector. Panteia was requested to carry out an exploratory study into the Dutch rail and logistics sector's possibilities, as well as ways for starting strategic cooperation to this end. The envisaged action framework was to be designed in conjunction with the European Commission's efforts promoting EU–Ukraine solidarity lanes. At the base of the study should lie a sound problem and stakeholder analysis, which are to be followed by an in-depth assessment of barriers and supporting actions to tackle them.

The European Commission requested in its Communication COM(2022)217 parties to consider ways in which to assist Ukraine in overcoming material and economic damage caused by the aforementioned war:

> *In order for its (agricultural) goods to reach the EU and world markets, and also to ensure that Ukraine could import goods of first necessity (such as humanitarian aid, food, animal feed, fertilizers, fuel), there is an urgent need for the establishment of alternative logistics routes using all transport modes, linking the EU to Ukraine, while Ukraine's access to Black Sea routes is restored. This requires the upscaling and development of corresponding freight services along these logistic routes linking Ukraine to seaports in the EU, where goods could be shipped farther or potentially also be stored. This is key not only for farmers in Ukraine, but also for consumers in the EU and beyond.*
>
> *The Commission will work with Member States, the Ukrainian authorities, transport operators, equipment suppliers and all other relevant stakeholders on both sides to establish alternative and optimized logistic routes: the new 'EU-Ukraine Solidarity Lanes'. These lanes will facilitate in particular the forwarding of agricultural produce from Ukraine, but also our bilateral trade in goods and access of Ukraine to international markets and global supply chains.*

2.2 Objectives of the study

In order to explore concrete ways in which the Dutch ministry, infrastructure managers, and wider railway transport sector may support Ukraine in setting up and using railway solidarity lanes, the study consisted of the following steps:

- In-depth stakeholder interviews with the Dutch sector, and stakeholders in relevant countries bordering Ukraine (especially the Polish rail freight sector and government).
- Analysis of market needs, especially for Ukrainian agriculture exports.
- Synopsis of existing railway flows accommodating exports of Ukrainian crop through the TEN-T network.
- Inventory of relevant Dutch railway assets, including wagons, terminals, transhipment potential, logistics concepts, especially for grain transport.
- Identify barriers for short-term uptake, as well as practicable measures to address these barriers.
- Identify concrete actions to be taken by stakeholders involved.
- Develop a concrete advice – especially focused on possible Dutch actions.

2.3 This report

This report is based on several sources: official and unofficial, interviews, expert's opinions, informal information and fact finding mission to understand the situation on the ground. Especially in this situation, where we face a total new situation, where new freight flows have to fit technical and physical in the already congested rail network in Western Europe, crystal clear facts and figures are limited.

This report is based on combining these sources and by counterchecking the facts and figures the results are validated. The report is structured following

- Chapter 1 shows the context of the study
- Chapter 2 introduce the study and its objectives
- Chapter 3 provides an overview of the market and constraints of the closed Ukraine ports.
- Chapter 4 shows the new transport flows from Ukraine to Western Europe since the war started
- Chapter 5 gives an overview of the Dutch assets in this market and whether these could be used
- Chapter 6 states all the possible barriers hindering the increase of transports from Ukraine
- Chapter 7 focus on the Ukraine – EU rail border crossing specifically
- Chapter 8 drafts measures at EU level to relief the bottlenecks
- Chapter 9 provides the recommendations to all involved stakeholders
- And in chapter 10 these recommendations are translated to specific Dutch actions

3 Market needs

3.1 Agriculture products

In 2021, Ukraine was among the largest wheat exporters in the world. Before the war, the country had the capacity to export through its Black Sea ports up to 6 million tonnes of wheat, barley and maize per month but exports collapsed to just 300.000 tonnes in March and 1.1 million in April.

Ukrainian grain exports, amounting to some 60 million tonnes per year, were mainly handled through the country's primary seaports:

- Port of Odessa – throughput 8.62 million tonnes of grain (2015)[3]
- Port of Illichivsk – throughput 5.1 million tonnes (idem)
- Port of Yushny – throughput 9.75 million tonnes (idem)
- Port of Mykolaev – throughput 8.5 million tonnes (idem)
- Port of Oktyabrsk – throughput 2.4 million tonnes (idem)
- Port of Chornomorsk – throughput 4 million tonnes (2021)[4]

Important export destinations were Europe, the Middle East and North Africa (MENA) region, and East Asia. As can be seen from the figure below, in 2019 Europe imported some 14 million tonnes of Ukrainian grain, mostly consisting of corn.

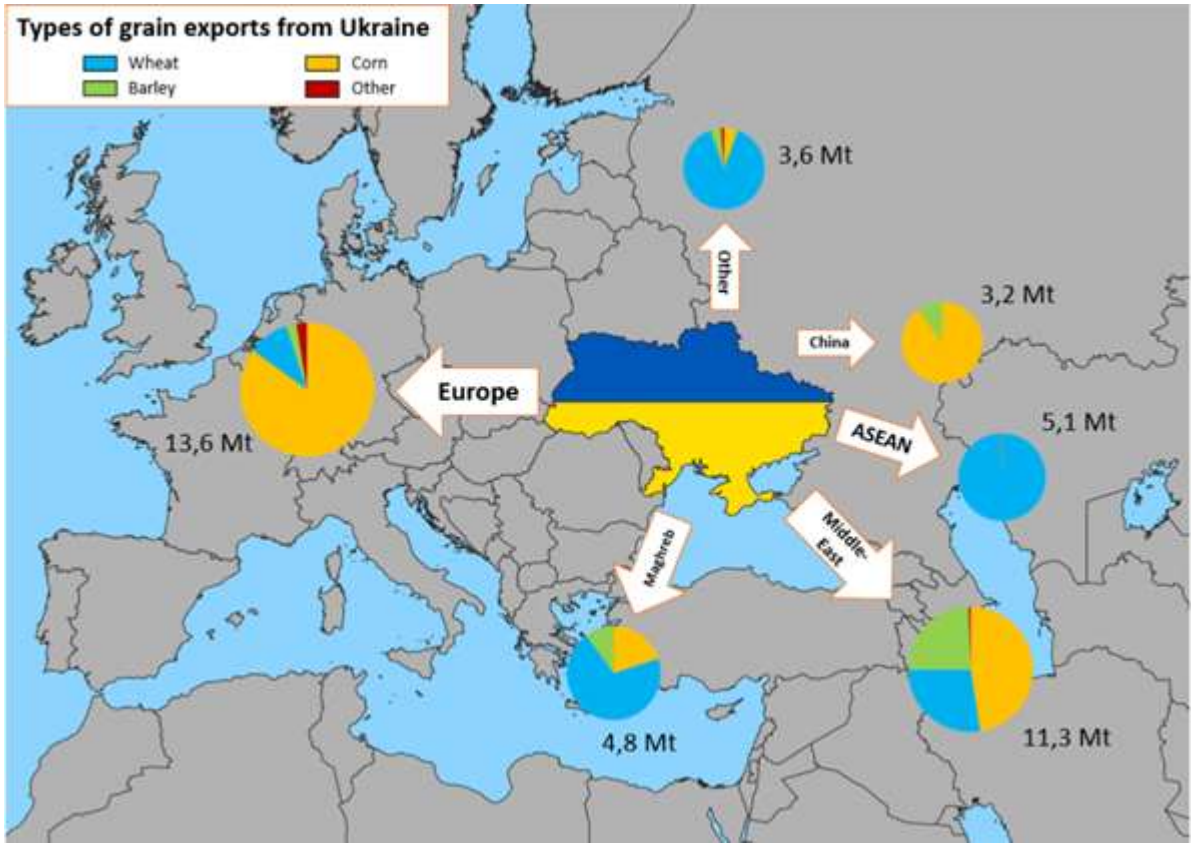

Figure 1 Pre-war export destinations of Ukrainian crop (data source: https://www.agriculture-strategies.eu/en/2019/05/exports-of-ukrainian-corn-to-the-european-union-counter-meaning-on-the-new-silk-roads/)

[3] https://openjicareport.jica.go.jp/pdf/12288916.pdf; https://odessa-journal.com/2021-yearly-results-of-odessa-sea-port/
[4] https://www.marineinsight.com/know-more/5-major-ports-of-ukraine/

3.2 Containers (general cargo)

Before the outbreak of the war, Ukraine's seaports handled some 1 million TEUs per year, with imports and exports accounting for roughly similar shares. Over 2020, according to the Ukrainian Sea Ports Administration, export container traffic made up for 495.4 thousand TEU, with imports standing at 509.6 thousand TEU.

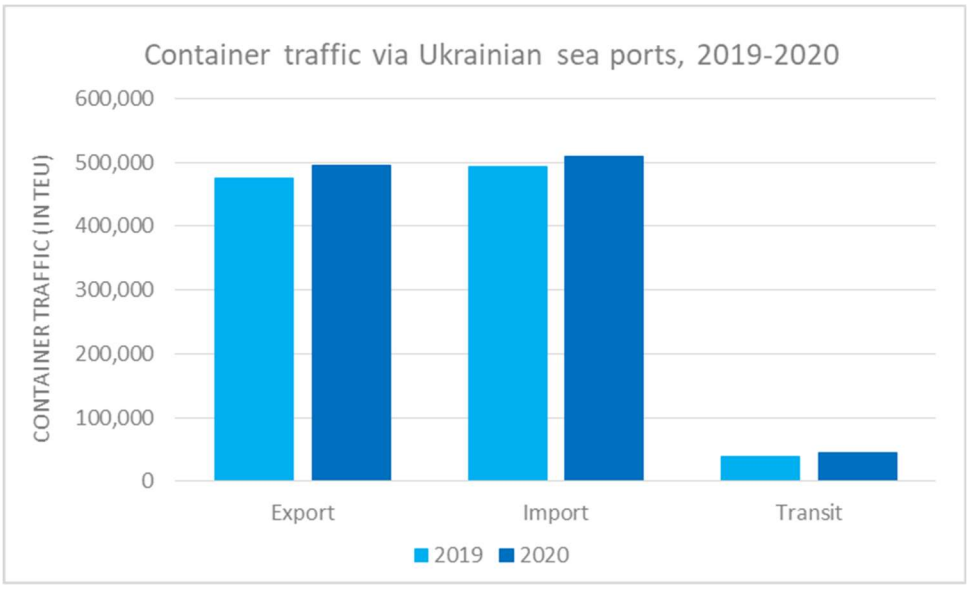

Figure 2 Pre-war container flows through Ukrainian seaports, import and export (data source: see below)

Ukraine's container flows were essentially handled by three seaports: Odessa (652.2 thousand TEU); Yushny (Pivdenniy – 243.8 thousand TEU); and Chernomorsk (formerly known as Ilyichevsk – 152.7 thousand TEU).[5] In 2021, container traffic between Ukraine and the EU (maritime flows) stood at over 171.000 TEUs. These comprised over 78.000 imported TEUs (from EU to Ukraine), and some 93.000 exported TEUs (Ukraine to EU). Vital trade partners in the EU are Greece (taking around half of the volumes) and Spain.[6]

[5] https://seanews.ru/en/2021/01/26/en-container-traffic-via-ukrainian-ports-in-2020/
[6] Eurostat

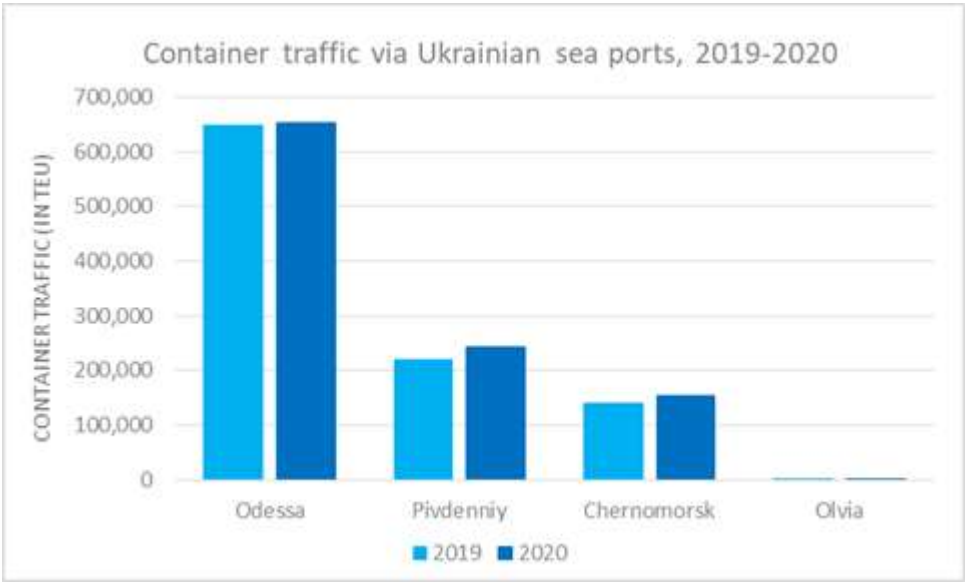

Figure 3 Pre-war container turnover of Ukrainian seaports, per seaport (data source: as previous)

3.3 Conclusion

The above figures demonstrate that, in the event of long-term obstruction or uncertainty pertaining to the functioning of Ukrainian seaports, large demand exists for grain and container traffic through EU railway lanes. In addition, a considerable share of these volumes might have to be re-exported through EU seaports.

Based on an assumed load of 2.000 tonnes per train, handling through European railway networks all of Ukraine's 60 million tonnes of grain exports would entail an estimated 30.000 trains per annum (unidirectional).

Handling through European railway networks Ukraine's agriculture exports to the EU, amounting to some 14 million tonnes per year (see figure 1), would entail an estimated 6.800 trains per annum (unidirectional). Based on 250 operational days per year, this would involve over 27 trains per day.

Accommodating an assumed 500.000 TEUs of containerized flows would involve a further estimated 6.000 trains (bidirectional) annually, or some 24 trains daily.

4 Railway flows

4.1 Initial synopsis

At the start of this study, in June 2022, Ukraine had stored at least 20 million tonnes of surplus grain in silos. The APK-Inform agricultural consultancy estimated that another 40 million tonnes would come available for export once the new harvest would come in over summer. The Ukrainian government had expressed the intention to send 700.000 to 750.000 tonnes per month from two small ports on the Danube river to Romania, from where it should be shipped to North Africa and Asia. Thus, the remaining crop would have to be handled by Europe's TEN-T network (via road and rail).[7]

By mid-June of this year, some 616.000 tonnes of Ukrainian grain had reportedly reached the Romanian port of Constanta, with an additional 166.000 tonnes set to arrive in the following weeks, according to the port's administration.[8] At the end of September, it was reported that since the start of the war some 4,5 million tonnes of Ukrainian grain had reached Constanta[9].

Comparable volumes were being transported by rail through Poland and its seaports. Polish railway authorities reported to the consultant that flows possibly reached a peak of up to 18 trains per day, carrying some 2.000 tonnes per train. However, our estimates, based on capacity of end terminals in Polish seaports, reckoned with a sustainable flow of some 10 trains per day.

Other destinations in the EU, including Hungary, Slovakia, Germany, as well as the Netherlands, had picked up at far lower pace.

4.2 Peak flows achieved

In all, trains carrying grain through the border countries at the peak during June and July are estimated at:

- Poland – 10 per day
- Germany – 5 per week
- Slovakia (via Cierna border crossing) – 5 per week
- Hungary (via Chop) – 2 per day
- Romania – 1-2 per day (in addition to inland waterway transports)
- Netherlands – 3-5 per week (amounting to some 5.000 – 8.000 tonnes of grain per week)

In total, peak railway flows thus amounted to some 15 to 17 trains, or roughly 30.000 tonnes, per day.

4.3 Flows as of October 2022

As already hinted on in the preface, an important side effect of the reopening of Ukraine's seaports from July onwards concerns the previously created export flows by rail. According to market parties, as of late September the supply of Ukrainian grain at the EU border had diminished and become volatile or even unreliable.

[7] https://www.reuters.com/markets/commodities/black-sea-ports-still-best-way-get-ukraines-grain-moving-fast-2022-05-26/
[8] https://www.voanews.com/a/romanian-port-struggles-to-handle-flow-of-ukrainian-grain-/6632795.html; https://www.aljazeera.com/gallery/2022/6/16/photos-romanian-port-becomes-key-transit-hub-for-ukrainian-grain
[9] https://www.reuters.com/markets/commodities/ukrainian-grains-still-using-danube-gateway-romanian-black-sea-port-2022-09-28/

The Ukrainian railway system is capable of delivering grain to the seaports in a highly efficient way. Consequently, using the Black Sea ports is now more attractive than railway connections, with Ukrainian traders seen aiming for maritime exports of 3 to 4 million tonnes per month. The resulting unstable supply of grain at the EU border renders maintaining, let alone expanding, railway supply lines challenging.

Consequently, market parties point at the likelihood that under present conditions, previously added supply lines involving European railways cannot be kept operational. Likewise, investments required for a further expansion of these railway connections are deemed unrealistic from an economic perspective.

The above described dynamics imply that, in the present situation, any renewed obstruction of Ukraine's seaports would present Europe with a challenge roughly identical to that of the first halve of 2022. At the same time, all relevant parties (the Ukrainian government, European Commission, Member States, market parties) have expressed the desirability of maintaining and expanding railway connections as a strategic alternative.

It has been suggested that in order to achieve this aim, it is essential that medium to long term clarity be created pertaining to the targeted rail bound volumes, consequently to be handled at the border terminals. An added advantage of maintaining considerable, efficient export flows by rail would be that any further increase of these flows in case of closure of the seaports would likely be less challenging.

5 Relevant railway and seaport assets Netherlands

Obviously, the transportation process and suplly chain organization are ultimately being decided by commercial trading companies, who buy the grain under market conditions from Ukrainian producers. In order for supply chains to be viable, the routing and choice of transport mode are therefore determined by matters such as transportation cost and reliability. Vital for flows involving the Netherlands has so far been Teuro Granen, Tilburg. A second trader, Viterra, has also occasionally operated trains to the Netherlands. Over summer, Teuro operated some 4 trains per week using bulk wagons, which were reaching Oss (OOC). In addition, one to two weekly trains using dedicated containers are received in Tilburg (BTT).

Both OOC and BBT have the advantage of trimodal connectivity, enabling direct transhipment to barge (although BTT cannot handle bulk wagons). Dedicated grain loading (bulk) facilities are also available in Coevorden (Graaco) and Rotterdam (EBS). However, Coevorden lacks access for barge, whereas Rotterdam was so far not used for trains carrying Ukrainian crop.

For transports to the Netherlands, Ukrainian grain trains have used the 1520mm LHS line to Zlote Ziarno terminal (Poland), where transhipment to 1435mm gauge takes place. Also, trains were loaded in Sosnowiec and other stations in the South of Poland. The grain is bought directly from Ukrainian trade companies.

However, materiel constitutes a major bottleneck. This concerns grain wagons, containers, and locomotives. Also, train drivers are scarce. Moreover, investments at Dutch end terminals, are required for increasing the number of transports.

6 Barriers

6.1 Operational barriers

Essential barriers for increased grain transports, including to the Netherlands, primarily pertain to the European network. These are related to:

- Wagons
- Containers
- Border transhipment/terminal reloading
- Border checks
- Train paths
- Locomotives
- Drivers
- End terminal investments (in the Netherlands)

Rolling stock

Grain wagons are in short supply in the EU. Moreover this problem is compounded by inefficiencies on the railway network and at the end terminals, rendering roundtrip times too long.

Coal wagons could be made usable, but are now also demanded for increased coal supplies. Another option occasionally used are 20ft. standard containers; however, this solution was considered too costly in most cases.

For grain wagons, manufacturer Greenbrier has estimated that in order to move Ukraine's grain exports over European railways, at least an additional 2.000 wagons are required. It has increased its production from 20 to 60 wagons per month.

Polish PKP was studying the use of Ukrainian grain wagons with alternative bogies. However, due to wagon dimensions and specific regulations it was not deemed feasible to extend this to Germany and / or the Netherlands. Also, reportedly the materiel was not delivered for use on the Polish network.

Rolling stock was also one of the issues that arose in both the Solidarity Lanes consultation with the private sector and the consultation between the Member State representatives. Despite all the progress made in the framework of TEN-T, the EU still does not have an accurate and updated overview of the EU fleet of rolling stock/goods vehicles. In 'normal' times, this is already an obstacle to the efficient deployment of freight wagons and to attracting private investment in the sector on a European level. In times of crisis, the lack of transparency hinders a quick and adequate response to the occasional need for wagons.

In the US, up-to-date data on composition, age and deployment of the freight car fleet - regardless of the owners of individual wagons - are available at individual wagon level, subject to commercial confidentiality. This transparency improves efficiency with regard to production and deployment of rolling stock. In addition, this transparency helps to reduce the cost of raising private capital (e.g. as Asset Backed Securities) in the sector. The EU lacks such an aggregated overview, although the data are available in a scattered form (from national network operators, ERA, GCU, etc.). The EU Agency for Railways (ERA) has a wagon register, but this information can not be used easily for the aforementioned purposes. This topic deserves attention at the EU level.

Containers

Intermodal containers can be made to use for grain transport relatively easy. Although there is a general shortage of containers, dedicated container sets that can run up and down solidarity lanes can be found. However, destination terminals may require certain adjustments. Also, in most cases the use of containers for grain transport was deemed too costly for effective market uptake. Container transport for grains can be significantly more costly because of less efficient loading and unloading procedures and lower train loads.

Border / phytosanitary checks

Even as the EU has declared phytosanitary checks for grains redundant, such checks are still reported by operational and market parties to be time-consuming. A potential solution to be considered could be an EU-led customs taskforce, which could take samples for physical checks at a number of Ukrainian loading points, thus cutting out long waiting times at the borders.

A reported example of the related obstruction is the Werchrata border crossing. The Ukrainian side of this station features a large storage and loading facility (Cargill), but the area lacks the phytosanitary authorities needed.

Train paths

In a number of cases, notably Romania and Hungary, a shortage of train paths is reported. This is due to capacity limitations of the infrastructure, as well as preplanned infrastructure upgrading works.

Drivers, locomotives

Within the EU, there is a pre-existing shortage of train drivers and, in smaller measure, locomotives. In order to address this challenge, priority may have to be given to transports related to solidarity lanes.

Market organization

Grain is usually (also in Ukraine) traded on basis of the Incoterm FOB (Free On Board). That means that the cost of the transport from farm to port including loading of the vessel are paid by the exporter. Because trading terms are transparent, standardised and commonly used, the availability of FOB makes grain export via the port more attractive. For rail transport splitting up the transport process, as is done for maritime export, is more complex. For rail transport it is the company, which takes over the grain at the border, who pays the border terminal for the unloading of the UA train and reloading of the EU train. It merits investigation whether Incoterms FOB EU train could streamline the logistics and make UA grain export overland more attractive and efficient. Such terms require the technical possibility to buffer full train loads at the border terminal.

Investments in transhipment / end terminals

Border transhipment facilities, necessary for overcoming the break of gauge between the Ukrainian 1520mm and European 1435mm networks, are short of capacity in all frontier states (Poland, Slovakia, Hungary, Romania). In part, this could be ameliorated by being able to bring European rolling stock within Ukrainian territory (using 1435mm stretches to Ukrainian terminals). However, although the Ukrainian government has offered to cover risks associated with non-insurance, an EU devised scheme for this is lacking. Nevertheless, reportedly European rolling stock was loaded on Ukrainian territory in some instances.

In addition, extensive and urgent investment in border terminals are essential for all frontier states. This also pertains to options for temporary storage of significant volumes on the Polish side of the border. A further specification of solutions required is recommended.

Buffer (storage) capacity

As set forth already, transhipment terminals (both at the EU/Ukraine border stations and at the end destinations at either inland or seaports) should be capable of efficiently unloading the trains. Also, fast roundtrips of the rolling stock requires decoupling between the railway and transhipment processes. Therefore, the transhipment and end terminals require sufficient buffer capacity (i.e. storage), so that unloading of the trains and loading of the trains or ships (either ocean-going or barge) can be done independently.

For the Netherlands, both terminals in Oss and Tilburg are capable of direct transhipment to barge, allowing for flexible through transportation to various end customers (currently trains carrying Ukrainian grain primarily serve the Dutch market). With existing capacity, OOC could handle 6 trains per week (initial numbers were 3-4 per week); BTT could handle three trains per week (initial goal was 3 trains per two weeks), and has expressed an ambition to expand to a daily train.

However, for greater volumes additional investments are required. Among other things, grain (un)loading materiel of different sorts must be acquired, buffer capacity should be expanded or created, whereas additional sidings in Oss would also speed up operations.

These investments (partially in conjunction with the infrastructure manager) are delayed / held up by a.o.:

- Extended public license procedures (milieuvergunning, omgevingsvergunning), handled by the local municipality
- Uncertainties regarding the longevity of the market: will the investment still be justified in the event of a reopening of Ukrainian seaports?
- Regular planning procedures of the infrastructure manager

6.2 Political and market uncertainties

As described in the preface, the relevant implications of the Black Sea agreement of late July were threefold. Firstly, Ukrainian exports of grain through the Black Sea were partly resumed, reaching some 1.7 million tonnes in August and 3.8 million tonnes in September. Secondly, as a result, previously developed railway flows carrying Ukrainian crop into the EU have become more volatile. And finally, the further development of such connections was rendered considerably more difficult, even as their strategic desirability is recognized by all parties involved. Thus, market volatility, capacity and operational impediments and geopolitical uncertainties play into each other.

However, even at the time of peak railway flows, an important, recurrent question concerned the longevity of required investments – especially in terminal facilities and rolling stock. In case the war would be resolved, or Ukrainian seaports reopened within e.g. one year, especially transhipment investments could become redundant. In order to allow for fast investment progress, these investment risks should be quantified and guaranteed, either at EU or at Member State level.

Additional considerations

As of now, the view in the railway market is that a centralized lead in overcoming barriers, at EU level or otherwise by the most relevant Member States, is lacking. The EU could aim to take the

lead more actively in order to overcome barriers and develop a coordinated approach (also pertaining to financing). So far, the approach is fragmented, with each border country trying to optimize for itself.

A concerted European approach is especially vital with regard to a stable and predictable grain supply at the border stations. The EU may pursue an agreement with the Ukrainian government setting a target for the volume supplied, on which the market could then build its logistics chains. An additional advantage of such approach would be that further scaling up, if needed, would likely become less challenging; the required measures for doing so more transparent.

Finally, a vital insight is that all barriers combined accumulate the risk that transportation costs are so high as to render break-even operations for (Ukrainian) grain traders impossible. Therefore, it might be considered that public (EU) subsidies are necessary at this level too.

7 Border crossings

7.1 Poland

For Poland, the vital border crossings with Ukraine, located in the Southeast of the country, include Medyka, Dorohusk/Yagodyn, and Werchrata. Another border crossing, Hrubieszów, is part of the broad gauge LHS line. Although especially border capacity is limited due to various reasons, these infrastructure assets offer capacity for expansion of EU – Ukrainian grain lanes.

The results of an exploration of Polish-Ukrainian border points can be found in the attachment.

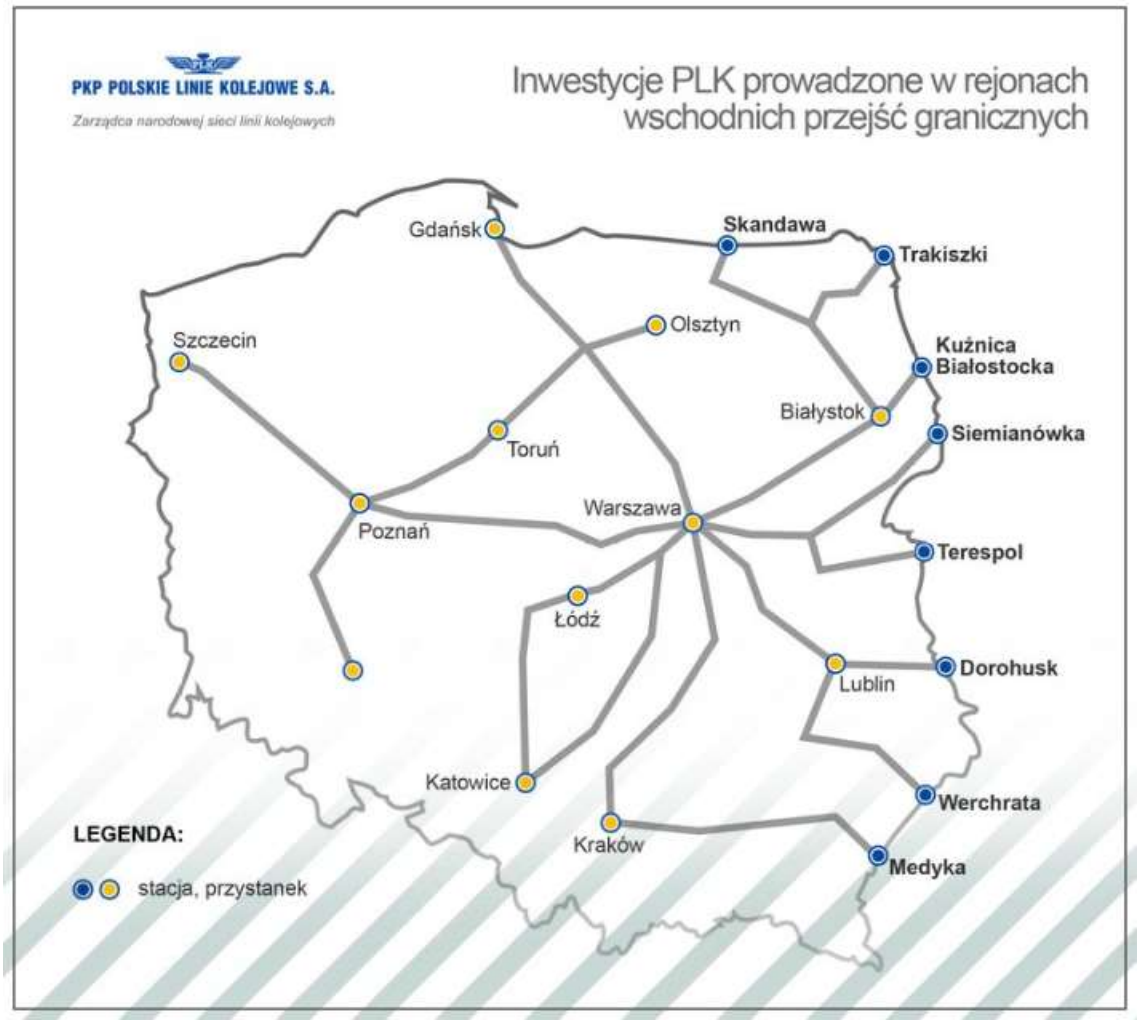

Figure 4 PKP map of Polish-Ukrainian border crossings (excluding LHS 1520mm line)

7.2 Hungary

Over the last decades, grain and other agribulk were not the main type of cargo handled at the border stations and reloading installations (i.e. the transhipment terminals located around Zahony). These facilities have always been specialized in iron ore, whereas agribulk has been very limited over the last 30 years.

It was emphasized that the Slovakian area (Cierna) is better equipped.

Over the last months, Zahony has handled some 2,5 trains daily, which is the maximum capacity. These consisted of two long trains (70 wagons, 850m), handled by MAV-owned terminal, and one shorter train (20 wagons), handled by private-owned terminal. Also, another company uses the border crossing to take standard gauge trains from Ukraine into the EU. Small numbers.

The two trains handled on the MAV-terminal are operated by Rail Cargo Hungary, with destinations including the Balkans and Adriatic.

Zahony area
Both Zahony (HU) and Cierna (SK) are connected to the area around Chop (UA).

Zahony operates eight shunting locs for broad gauge. However, these are in a poor state, resulting in much downtime. Shunting locs are continuously needed for emptying and loading the trains.

Also, the terminal and station tracks are not in a good condition.

Of course standard gauge grain hoppers are not sufficiently available anyway.

Finally, lots of disused wagons, such as stalled Russian but also Ukrainian wagons, are occupying the tracks, limiting efficient shunting operations. These are wagons of various types: flat wagons, open wagons, etc. Some 500 Russian wagons cannot be sent back, as the only route goes via Ukraine.

Upgrades / investment plans
MAV is considering limited upgrading works, such as for station tracks. Some of them can be recovered. The same goes for transhipment equipment, some of which has been disused.

However, not all terminals are owned by MAV (some of it is private-owned). It is emphasized that the Zahony area is governed according to the EU rules (i.e. liberalized market).

They do not have high expectations regarding additional market uptake and longevity of investments. They assess anything more than small revisionary works is not justified due to the highly uncertain market.

In all, the Zahony area comprises four or five private-owned terminal companies and one MAV-owned company. The RUs are serving them all, taking trains from the border to the terminals. So there is no coordination. No comprehensive overview is made.

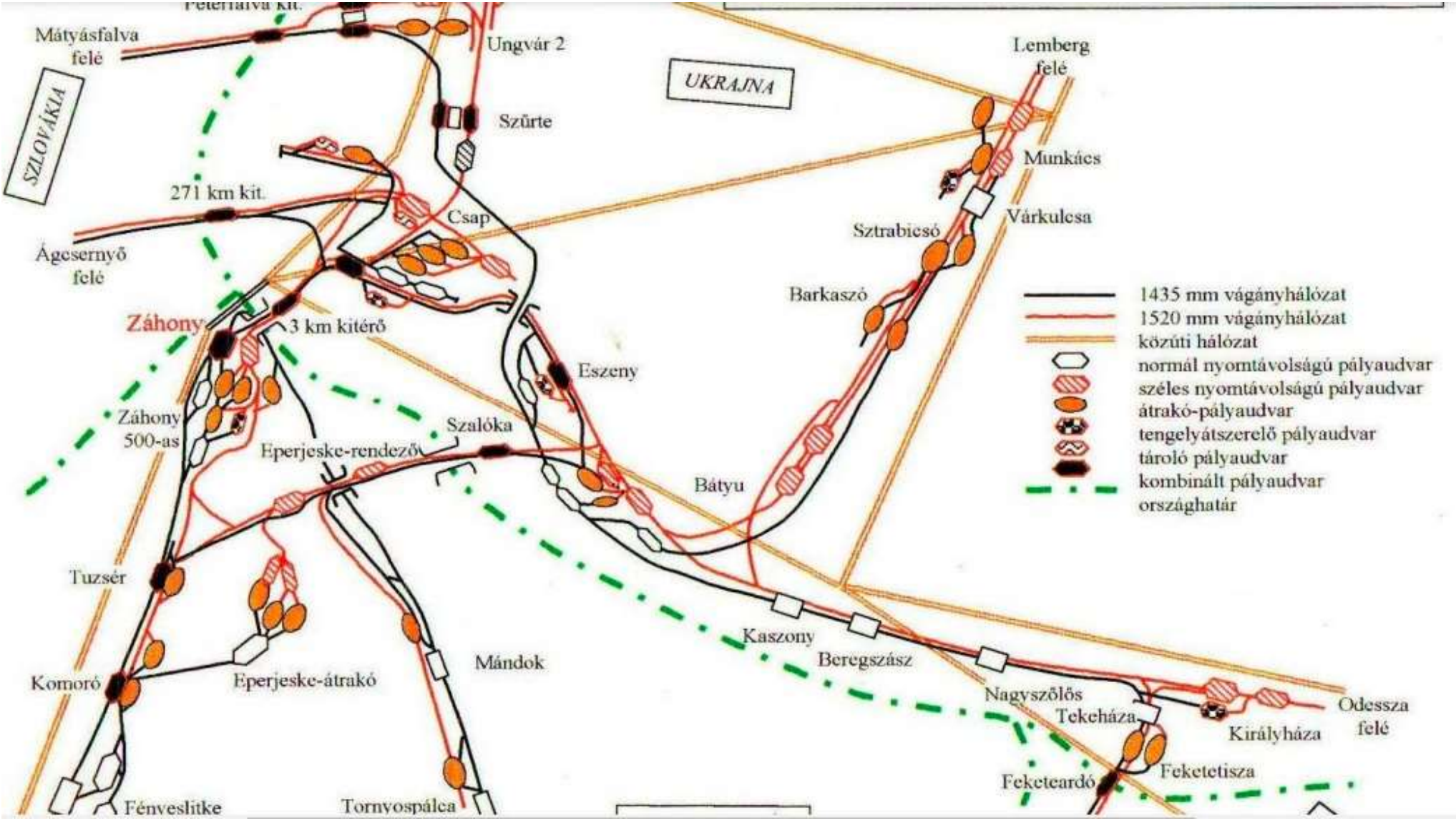

Figure 5 Zahony border area (source: MAV)

7.3 Slovakia

It is considered that the border stations and reloading installations (Cierna) are not the problem: so far more capacity has been available than what was requested. The problem is the shortage of wagons.

Nevertheless, it is possible to increase the border station's capacity by optimizing processes.

Both Cierna and Zahony (HU) are connected to the area around Chop (UA).

Organization

The issue of transporting goods from Ukraine is in Slovakia coordinated by the Ministry of Transport in cooperation with Prime Minister's-office, to whom infrastructure manager ŽSR is providing assistance. All transport requests from Ukraine could be accommodated, whereby there is still a free capacity for transporting higher volumes of goods. Rather than the capacity of infrastructure the biggest issue preventing transportation of higher amount of goods is lack of the rolling stock.

Volumes

As to the volumes of already transported goods, the following information was provided by ZSSK Cargo (leading freight RU in Slovakia):

1. On the axis Čierna nad Tisou – Bratislava-Petržalka: 8-11.000 tons of soya per month heading further to Germany, expected to increase to 12.000 tons per month,
2. On the axis Čierna nad Tisou – Čadca/Lúky pod Makytou: 7.000 tons of soya and corn per month heading further to Germany, Netherlands and Belgium,
3. On the axis Dobrá – Slovenské Nové Mesto: 3-8.000 tons of corn per month heading further to Croatia, expected to amount to around 6.000 tons per month in the near future,
4. On the axis Dobrá – Kúty, Lúky pod Makytou / Bratislava-Petržalka, 6.000 tons of corn and other agricultural products per month heading further to Germany, Netherlands and Belgium.

- The expectation for 3rd quarter of 2022 is to transport around 31.000 tons of agricultural products per month.

Use of the Uzhhorod–Košice wide gauge line

Recently there is an increased interest of transportation of cargo using wide gauge lines from UA/SK – Maťovce – to the terminal in Haniska pri Košiciach (near Kosice). This pertains to 20.000 tonnes per month corn, wheat, barley and oils, where the cargo is transhipped to standard gauge rolling stock and transported to other EU states.

Investments

ZSR has indicated that investments in transhipment facilities are being considered, but are unlikely to materialize in the near future.

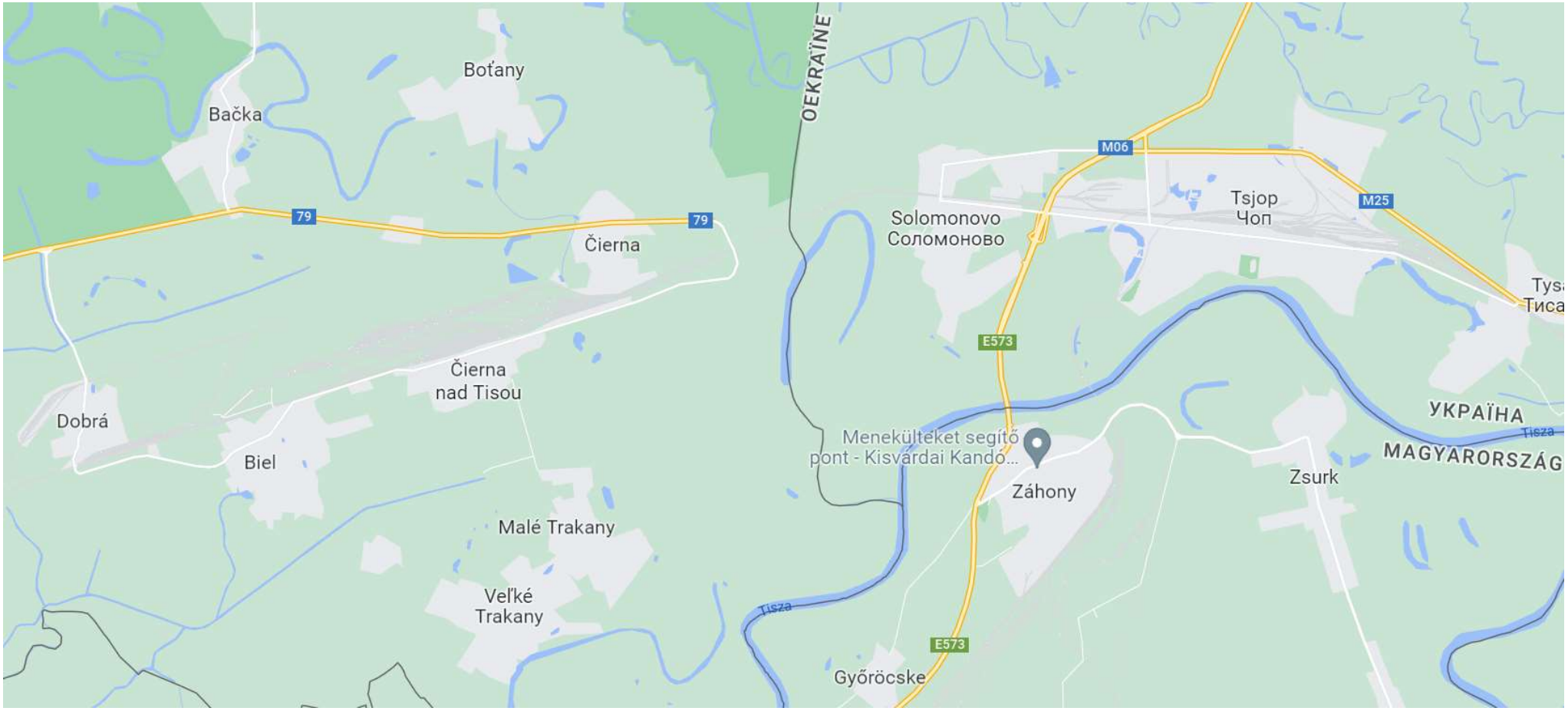

Figure 6 The border area between Ukraine (Chop), Hungary (Zahony), and Slovakia (Cierna/Dobra) (source: Google maps).

7.4 Romania

Existing border crossings

1. **(Satu Mare -) Halmeu CFR - Diakove UZ (- Koroleve)**

   Freight-only and dual gauge. UZ works to Halmeu on both gauges. 1520 mm gauge traffic runs to and from the gauge-changing and transfer facilities at Halmeu and an oil depot further south near Porumbesti. 1435 mm gauge traffic runs via the Ukrainian corridor line to Chop, with links to and from Čierna nad Tisou in Slovakia and Záhony in Hungary.

2. **(Sighetu Marmaţiei -) Valea Vişeului CFR - Dilove UZ (- Rakhiv)**

   The route across the border to Valea Vişeului is 1520mm gauge only and has been out of use since April 2006 owing to serious flood damage.

3. **(Dorneşti -) Vicşani CFR - Vadul Syret UZ (- Chernivtsi)**

   The line is dual gauge 1435/1520mm between Dorneşti and Vadul Syret, where there are bogie changing facilities.

   The Sofia - Bucuresti - Kyïv/Moskva service via this route was withdrawn in December 2014. Trains between Suceava and Vadul Syret were suspended in 2020 because of COVID-19 and had not been reinstated as at May 2022.

4. **Constanţa CFR - Illichivs'k UZ {train ferry – disused?}**

   Freight only. 1520 mm gauge, with bogie-changing facilities to 1435 mm gauge thought to exist at Constanţa.

5. **(Sighetu Marmaţiei -) Câmpulung la Tisa CFR - Teresva UZ (Disused)**

   Teresva to Câmpulung la Tisa is 1520mm gauge only, with dual gauge 1435 mm/1520 mm from there to Valea Vişeului. This crossing has been out of use since a new road bridge was opened across the Tisa, between Solotvino and Sighetu Marmaţiei. The Ukrainian Railways operated passenger service to Sighetu Marmaţiei was allegedly withdrawn during 2007 due to smuggling. CFR 1435mm gauge freight traffic to Câmpulung la Tisa has ceased west of Sighetu Marmaţiei.

(See border crossings indicated in map below).

Apparently, Valea Vişeului – Dilove (crossing nr. 2) is also disused, Ukraine reported to have restored the connection on their side of the border but Romania so far has not. The same would go for Campulung la Tisa (RO) into Ukraine (Railfreight.com). Plans have been reported regarding the rebuilding of the 1435mm line from Slovakia/Southern Poland, via Ukraine and the Ukrainian-Hungarian border to Romania (also mentioned by EIB).

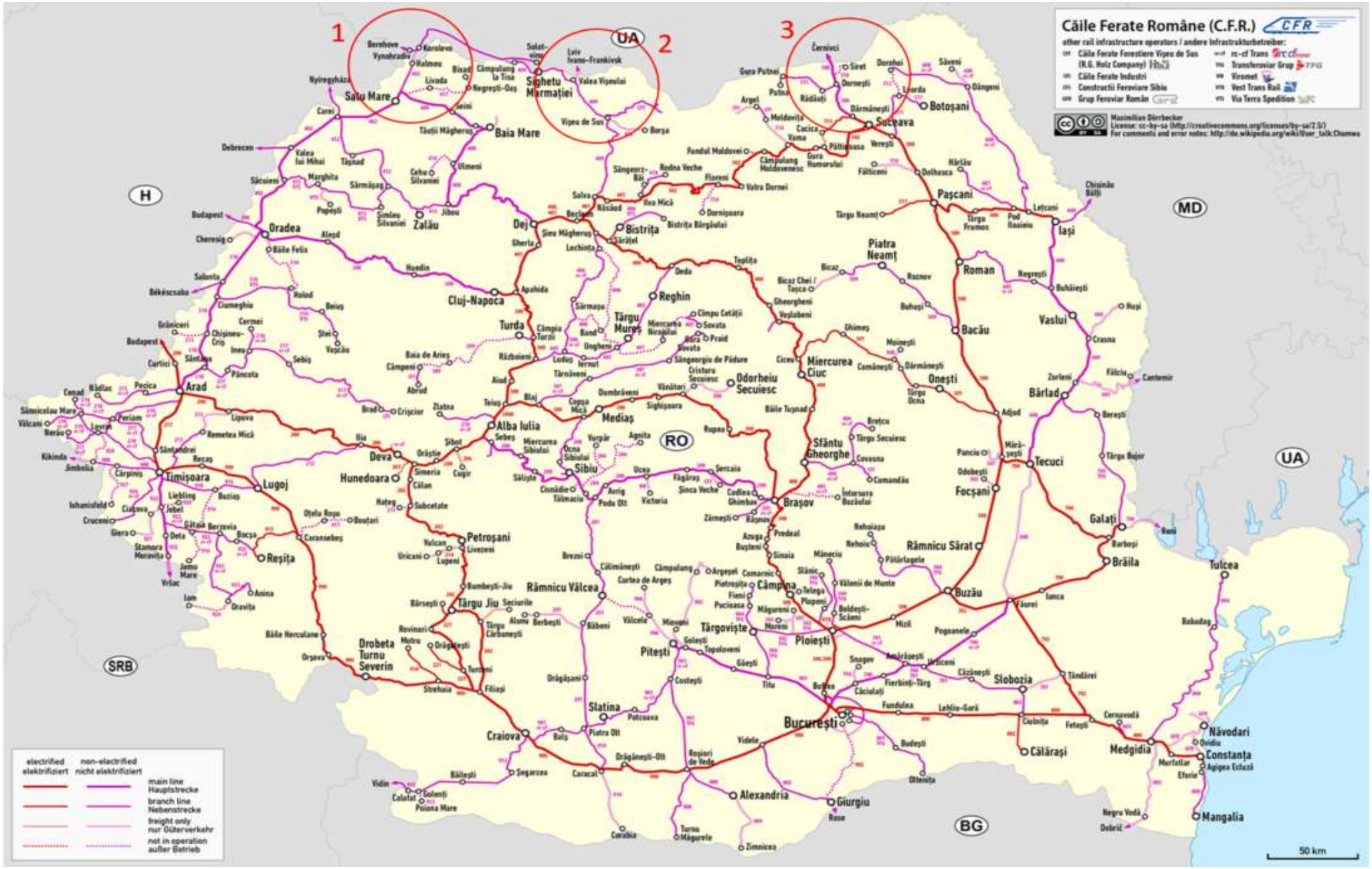

Figure 7 CFR map of railway border crossings Romania – Ukraine

8 Measures on EU level

Transportation of any significant share of Ukraine's grain harvest will extensively involve private (railway) businesses. However, considering the magnitude of the challenge, we assess that a realistic approach can only entail coordinated intervention at EU and/or governmental level. Emphatically, this involves creating a realistic medium to long term perspective regarding the volumes expected, as well as enabling the required investments in transhipment stations and materiel.

As a point of departure, a realistic volume target to be agreed between the Ukrainian and European authorities could match the pre-war export of Ukrainian crop to the EU, or roughly 14 million tonnes (see p.6). Agreement on such target would provide the market with the required clarity on which to build its supply chains, and would enable European authorities to define and employ the steering instruments that are available to them.

In order to realistically allow for transportation of such share of Ukraine's harvests, a structured approach is needed. In addition, for capacity reasons, such approach needs to involve utilizing all relevant EU corridors. The European Commission and Poland, Slovakia, Hungary, Romania, and likely Germany and the Netherlands, should coordinate on realization of targets for their respective grain lanes.

In the intermediate term, this could mean taking stock in, and coordinating scaling up to e.g. the following train numbers:

- Poland – 10 trains per day
- Romania – 2 trains per day
- Slovakia – 4 trains per day
- Hungary – 4 trains per day
- Germany – 2 trains per day
- Netherlands – 2 trains per day
- Etc.
  (These are hypothetical numbers that serve to illustrate the necessary levels of ambition and do not reflect current policy)

Relevant MS could take the lead in assessing, together with their respective sector parties, what transportation and processing capacities are available and what financial means are required for scaling up. Where relevant, terminal investments may be fastened by speeding up procedures for public licenses.

Infrastructure Managers should prioritize sufficient train paths, including at intra-EU border crossings, to grain trains.

Customs authorities should limit phytosanitary checks at the Ukraine-EU border to a minimum. In order to assist this process, physical checks could be performed at load location within Ukraine. This could be taken care of by an EU-led taskforce, or a privately set-up taskforce reporting to the Commission and the customs authorities of the respective frontier states.

For available border crossings (Ukrainian border), a detailed inventory of transhipment capacity and requirements is needed, based on a long-term perspective of expected volumes. In follow-up, the Commission and/or Member States should make available the funds or investment guarantees necessary for upgrading these crossings to the required capacity.

Member States and/or the European Commission should shortly make available credible funding facilities, or provide capacity guarantees, allowing sector parties to acquire and direct sufficient materiel, as well as personnel, towards the grain lanes.

In short, there are essentially 4 buckets of financial guarantees/support that would aid the development of Solidarity Lanes:

- Surety/insurance for risk of loss of rolling stock that enters Ukraine from the EU and is stranded. The Ukrainian government offers to cover the un-insurable risks - but it would give more comfort if the EU / EC were to step in.
- Financial garantees in case of lack of volumes available at the border.
- Absorption of the cost differential for overland versus sea transport that hits the individual shipper (farmer).
- Direct public investment in transloading infrastructure at rail terminals and ports.
- Support for investment in rolling stock by railcar owners. If the market for the Solidarity Lanes does not materialize or deteriorates due to the availability or access to sea ports, how can the rolling stock owner recover the cost of the investment in asset that will need to be repurposed away from the Solidarity Lanes.

9 Recommendations

- The cheapest and most efficient route for exporting Ukrainian grain is via the country's maritime ports. The overland route (by rail) to the EU is per ton more costly. Dependent on an efficient transport system, there are certain limited opportunities for UA grain to be exported to North Western EU countries. If for strategic reasons it is considered necessary to route major flows of grain export overland, an intervention in the market is needed. Without such intervention the demand for the overland rail route will remain volatile and an option of second choice depending on functioning of the ports.

- Such intervention should, emphatically, include the provision of a medium to long term perspective pertaining to the volumes expected. This target, ideally to be agreed between the Ukrainian and European authorities, could take as a point of departure the pre-war export volumes of Ukrainian crop to the EU (i.e. some 14 million tonnes annually).

- The capacity of the overland rail corridor for export of grain is amongst other factors limited by the availability of bulk wagons on the EU rolling stock market. The time consuming reloading operations at border terminals and consequent low productivity of the special rolling stock aggravates the scarcity of these resources. Evidently expansion of the fleet needs to be considered, but another very and possibly even more effective intervention for enhancing the capacity and reducing the transport cost of the overland rail corridor for grain is the upgrading of the reloading facilities at the UA-EU border, as well as the end (unloading) terminals in EU inland ports and seaports.

- Because of the scarcity of special grain wagons (hoppers) some EU companies used this summer bulk containers which were carried on intermodal trains. It was also explored to use standard maritime containers for grain transport from the Ukrainian border to destinations in EU. This is technically possible and can accelerate the volumes transported but is more expensive. The re-opening of the maritime route has made these companies to lose interest.

- The operational practice at the UA-PL, SK or HU border of reloading from wagon directly to wagon (without intermediate buffer capacity) makes the logistics complex and inefficient. This practice causes in particular prolonged turnround times for the wagons (The same applies for the practice of reloading from wagon directly to vessel is some ports). Investment in grain handling facilities with intermediate storage capacity at the UA-EU border reloading terminals and destination terminals is needed to facilitate the export of UA grain by rail to the EU.

- Investments in reloading facilities at the UA-EU border need a stable grain market, if the funding is left to the private sector. Under current circumstances and in order to create a strategic alternative for the cheaper maritime export route governmental support e.g. in the form of volume guarantees or (subordinated) co-financing is needed. UA has a series of instruments for public interventions in the grain market such as export quotas/licences, export taxes, installation of a policy business agreement, and partial reimbursement of Value Added Taxes (VAT). These could be used to ensure stable use of the overland rail export corridor.

- Conceive of an international team of experts to make a detailed assessment and analysis of border crossing infrastructure capacity and necessary upgrades, procedures including trading terms and conditions used, phytosanitary inspection requirements and (terms for bearing) the cost of wagon reloading operations.

10 Dutch involvement

Based on the considerations set forth in the previous paragraphs, we assess that the Dutch ministry and railway sector are in a position to positively contribute to the progressive development of EU – Ukraine solidarity lanes. We consider the following options:

- There is interest to increase grain transports by train from Ukraine via Poland to Netherlands. This was expressed by the Polish (railway) authorities on several occasions, and is emphasized by significant demand, as well as terminal capacity, on the Dutch market. Thus, the Netherlands are part of the overarching European solution as envisaged above.

- Due to the development of the market as described in this report, policy focus has shifted from short-term necessity to long-term strategy. The Netherlands may play a constructive role in helping shape European policy, taking into account the recommendations set forth in previous paragraphs. While doing so, the Netherlands could express an explicit willingness to assume, together with its rail freight and grain trading sectors, a tangible part of the burden (see chapter 8).

- Put the implementation of the solidarity lanes at the agenda for the Netherlands/Poland G2G on railways. With the G2G on railways, the Dutch authorities have a strong platform for international cooperation on railways. By enlarging the (geographical) area of cooperation, collaborating stakeholders can expand their cooperation to improve the accessibility of Ukraine via Poland. Using an existing instrument is a quick-win compared with creating a new platform for collaboration.

- Consider, in the framework of the Dutch-Polish G2G, a business-to-government / business-to-business mission to Poland of the relevant Dutch stakeholders. The program could also involve meetings with relevant Ukrainian parties. Concrete aim of the mission should be a (further) expansion of Dutch-Polish-Ukrainian rail freight, both for grain and for intermodal cargo.

- Make an inventory, in cooperation with the Polish transport authorities and the sector, of transhipment capacity and investment needs in Ukrainian border countries. Border crossings and their (re)loading facilities form an important bottleneck for the Ukrainian export. For example, the differences in railway gauges makes transhipment to other wagons necessary. Furthermore, materiel forms an essential bottleneck. This concerns grain wagons, containers, and locomotives. Also, train drivers are scarce. When the most stringent bottlenecks are identified, investments can be made to relieve the pressure on the most pressing bottlenecks.

- Make an inventory of the capacity and the investment needs of the LHS line in Poland. The Linia Hutnicza-Szerokotorowa (LHS) runs from the Ukrainian-Polish border to Katowice. This line runs 400km from Ukraine into the EU thereby offering a large potential for Ukrainian exports towards the Netherlands. Further investigation is needed if this railway link can be further integrated in the TEN-T network with links to the port of Rotterdam and the port of Gdansk. Another broad gauge railway track from Ukraine to the EU is the line between Uzgorod (UA) and Kosice (SK).

  For both lines, it is imperative that matters such as governance structure, operations, maintenance, investments, capacity bottlenecks are charted. If possible, additional sidings might carry the potential to significantly increase capacity in the short term. In addition, we noted that the broad gauge lines were largely omitted in the ERA briefing. An important

course of action to consider is to assist the Polish and/or Slovak authorities to acquire TEN-T eligible status.

- Develop together with the IFIs (EBRD, EIB, World Bank) a fund or facility to support investments. Private investments are held up due to the high uncertainty of the outcome of the Russian invasion of Ukraine. For example, when the conflict stabilizes the port of Odessa will be favored again for the Ukrainian export. Short-term investments are essential to ensure the port of Odessa is ready for the revived export. To prevent future market failure (Dutch) public investment in Ukraine must be made available.

- Investment or volume guarantees should be specified and elaborated at EU or MS level. This has become even more relevant since EU candidate status was granted to Ukraine and Moldova, increasing long-term volume perspectives.

- Relevant infrastructure in the Netherlands, as well as active traders, are in principle capable of handling significant volumes of Ukrainian grain, and therefore to make a contribution to rail solidarity lanes. However, bulk wagons are not readily available, implying a need for an intermodal solution (using 20ft standard containers). In addition, Polish railway authorities have repeatedly expressed the wish for cooperation in this regard with the Netherlands. However, under prevailing market conditions, a regular service using intermodal materiel is not deemed economically viable. In order to contribute to the sustenance and further consolidation of rail solidarity lanes, the Netherlands could consider supporting a start-up pilot for such connection. Such pilot should include Dutch grain traders and rail and logistics companies, as well as cooperation with the relevant Polish parties.