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Logistics Processes and Motorways of the Sea II

in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Progress Report IV – Annex 4

Transit Ukraine: Interim Report

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LIST OF ABBREVIATIONS

CIS	Commonwealth of Independent States
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
FFM	Freight Flow Model
IDEA	TRACECA Project: “Transport Interoperability and Dialogue between EU, Caucasus and Asia”
NTK	Net Tonne-Kilometre
OSJD	Organization for Cooperation of Railways (Russian: Организация Сотрудничества Железных Дорог or ОСЖД)
Ro-Ro	Roll-on Roll-off
TEU	Twenty-foot Equivalent Unit (containers)
UAH	Ukrainian Hrivna (US$1 = UAH8.15, €1 = UAH10.65)
USD	United States Dollar (also US$ or just $)
UZ	Ukrainian Railways (Ukrainian: Укрзалізниця)

EXECUTIVE SUMMARY

This report represents interim findings of a case study about a transit potential function of Ukraine for TRACECA corridor. In December 2011, this study was requested by the Ministry of Infrastructure of Ukraine as a LOGMOS pilot project to be developed and implemented by the beneficiary under recommendations of the EU technical assistance programmes.

The subject to this pilot project case study is to make an estimate of the economic cost to Ukraine, resulting from its failure to realize countries full potential share of transit cargo flows. The task can be re-stated as estimating the potential economic benefits from policies to promote transit cargo traffic via Ukraine.

There have already been several studies (2010, Ukraine: Trade and Transit Facilitation Study – World Bank, 2011, EU-funded Support to the Integration of Ukraine in the Trans-European Transport Network TEN-T) on this particular subject as well as more generally of the obstacles to cross-border cargo traffic in TRACECA, and recommendations for their mitigation or removal.

The LOGMOS Team started working on this task carrying out in particular investigations on the competitiveness of Ukrainian ports as compared to other Black Sea ports which were presented during the second meeting of the Ukrainian Working Group in January 2012

Further discussions were held in June and October 2012 and a target completion date set for April 2013. The finding of the study as presented it current version were elaborated in coordination with beneficiaries and stakeholders in Ukraine. Interviews, research and comprehensive primary data collection was carried out. The assessments and recommendations of this case study take into account results of the interviews with international cargo-owning stakeholders who may be potentially interested in transit of goods via Ukraine.

The results of traffic model developed by the EU IDEA I project were integrated in view of testing general transit improvement scenarios and its respective assessment with status quo situation.

This report summarises the current status and sets forward steps to be taken within this study in its introductory part. The chapter 1 presents assessments on existing transit traffic relevant to TRACECA via Ukraine. Potential transit traffic is assessed in the chapter 2 using a freight model, identifying lost cargos, reflecting on consultations with transport and logistics operators, as well as targeting subjects of route competitiveness. In the chapters 3 thought 5 the core elements of the assessment are presented – namely incremental revenues, incremental costs, and net benefits. Interim conclusions are provided in a summary chapter 6.

INTRODUCTION

A methodology of this study was discussed with the beneficiary from December 2011 and agreed during the Working Group meeting in October 2012. This methodology is straightforward and in summary allows to:

- Estimate potential additional transit traffic;
- Estimate the resulting incremental revenue to public and private sectors in Ukraine;
- Estimate the incremental cost;
- Analyse economic benefit as a function of additional traffic × (Incremental revenue – Incremental cost) = Benefits.
- Identify the main obstacles to increased transit traffic and measures most likely to overcome them.
- Compare the effort required to implement these measures with the benefits.

A computer model[1] has been developed to perform the computations and data have been collected from various sources as a basis for estimating incremental revenues and costs.

It had been expected that a full report could be produced by April 2013, but it has not proved possible to identify substantial specific volume of transit cargo flows that are likely to be attracted to Ukrainian routes if financial and time costs were substantially reduced and border crossings were improved through the adoption of recommended reforms.

The above was a result of an IDEA I model traffic model run, that demonstrated only a slight attraction of cargo through Ukraine in case the border crossings are improved. The border crossing improvement was applied to the whole TRACECA given regional purpose of the model. The model run suggested that if border crossing improvements of Ukraine go with same pace as the neighbouring countries, no additional transit cargo is attracted to Ukraine. But if Ukraine fails to modernise its border at least as much as its neighbours the country is likely to continue losing its current transit traffic. A more rapid increase of border crossing efficiency than the one implemented by its neighbours would direct new traffic via Ukraine. The border crossing improvement on a certain route is only a part of a complex decision making of a cargo owner to select its transportation option. As international studies, a TRACECA based TRAX index suggested also safety, level of service, intermodal capabilities, transparency of information count to reliability of a certain route. Promotion of the Ukrainian routes among potential cargo owners and shippers is also one of the aspects leading to improvement of transit function.

By releasing this Interim Report the project team works on analysis of new information that will allow further, more precise assessments to be carried out. Currently, an in-depth analysis of cargo flows via Ukrainian border crossings and international railway statistics are being analysed.

[1] EBUTT = Economic Benefits from Ukrainian Transit Traffic.

1 EXISTING TRANSIT TRAFFIC

According to Ukrainian Customs Committee data transit cargoes in 2011 amounted to 148.7Mt. The customs data include values as well as volumes. Still in 26% of cases (covering 95% of cargo volume) the value is not recorded, so cargo value has not been included in the analysis. More than 90% of transit cargo by volume comprises:

- Oil products (79%),
- Ores (7%),
- Fertilizers (3%),
- Stone/cement (2%) and
- Ferrous metals (2%).

Statistics was provided over the time span from 2007 to 2011. The above percentages are little different from those recorded in 2007.

Data from other sources have allowed for the project team to estimate the total volume of transit cargo, disaggregated by transport mode (see Table 1). It is notable that:

- All bulk cargoes are carried by pipeline[2] (two-thirds) or by railway (one-third).
- Of the non-bulk cargoes, about 10% of those carried by rail are containerised. By road the proportion is 50-60%.
- Road and rail have about equal shares of other non-bulk cargo.
- Excluding pipeline traffic, about 30% of all bulk and 75% of all non-bulk cargoes pass through one of the Black Sea ports.
- Ports handle 80% of transit containers. In addition, Odessa Port transships containers: more than 10,000 TEU annually.

Table 1: Estimated Transit Cargo Volumes, 2011 (tonnes)

	Rail	Road	Pipeline	Trans-shipments	Total	Through ports [a]
Bulk cargoes	46,000,000		93,000,000		139,000,000	40,000,000
Containerised	50,000	200,000		150,000	400,000	200,000
Other non-bulk	5,000,000	4,800,000			9,800,000	7,400,000
Total	51,050,000	5,000,000	93,000,000	150,000	149,200,000	47,600,000

a Included in Rail and Road totals.

A closer examination of the port statistics shows that no one cargo type is dominant. Oil, oil products, coal, chemicals, fertilizers, ores and cereals each account for between 6% and 17% of the total transit tonnage.

But only five countries dominated the list of origins and destinations for transit cargo passing through the ports in 2011: 80% originated in either Russia or Kazakhstan, and 40% were destined for Italy, Turkey or China. This pattern has been consistent at least since 2009.

[2] Pipeline traffic in 2011 was reported to be 93Mt.

2 POTENTIAL ADDITIONAL TRANSIT TRAFFIC

In consultations with beneficiaries, the project team has applied three independent approaches to estimating potential additional transit traffic:

- Running the Freight Flow Model - FFM (developed by the IDEA Project) to quantify the increased transit flows that would follow the implementation of recommended border crossing facilities and procedures.
- Analysis of State Customs Service data to identify significant transit cargoes that have been lost since 2007. Such lost cargoes may have been redirected to competing routes; or perhaps they no longer exist because of changing economic conditions.
- Consultation with transport operators to identify specific cargo flows that would be candidates for transit through Ukraine if costs and transit times were reduced or service reliability improved.
- Assessment of Ukraine's competitiveness for transit traffic, now and in the future.

The results of each approach are described below.

2.1 Freight Flow Model (FFM)

In view of the preparation of the Ukrainian transit study a specifically developed EBUTT econometric model was complemented by the results of the TRACECA freight model (FFM).

The FFM contains existing freight flow data and mode-specific costs (in time and money) for each transport link and border crossing point. If relative costs are changed, the model re-assigns freight flows to minimise total cost.

Due to regional design of the model, it does not permit border crossing costs to be changed for a single country, so the assumption that recommended improvements would be adopted was applied throughout the TRACECA network. This had two effects on the Ukrainian transit study assessments:

- On one hand, TRACECA routes would be likely to attract transit cargo from other routes, benefitting all TRACECA countries including Ukraine.
- On the other hand, Ukraine would gain no competitive advantage over its TRACECA partners from implementing its own improvements and reforms on the same pace as its TRACECA neighbours.

There is no way of knowing which of these effects, one positive and one negative, is the stronger. The project team consider it is the former, since the trans-Caucasus route (via Georgia, Azerbaijan and the Caspar ferries across the Caspian Sea) is complementary to Ukraine's road/rail and ferry transit route between Northern Europe and Central Asia.

The model produced route-specific and mode-specific predictions of transit freight flows in 2020, with and without recommended improvements to border crossing facilities and procedures. The results are surprising:

- There are significant re-assignments between Ukrainian transport routes, but not between transport modes.
- The difference in total transit freight flows is insignificant for road and maritime modes and small for rail. Taking the average of inward and outward cargo movements, the overall difference is 1.9%.

The consultants have sought explanations for this. Their tentative conclusion is that, important as border crossing improvements are, they are not enough by themselves to bring about a significant shift in the choice of transit routes. Higher pace of border crossing improvements, along with work on image of the Ukrainian routes are likely to add to a positive effect on transit via Ukraine. Multimodal facilities at major infrastructural bottlenecks, quality of logistics services as well as safety and security of cargo in transit are among factor favouring transit attractiveness of the country (see also 2.3). The results of running the FFM are summarised in Table 2 below, and presented graphically in Annex I.

Table 2: Summary of FFM Output (tonnes/day)

	2020: Do nothing case		2020: Reform case		Change	
Transport mode	Into Ukraine	Out of Ukraine	Into Ukraine	Out of Ukraine	Into Ukraine	Out of Ukraine
Road	10,621	15,127	10,526	15,186	-0.9%	+0.4%
Maritime	37,956	130,032	37,811	130,063	-0.4%	+0.0%
Rail	374,773	341,451	375,409	359,208	+0.2%	+5.2%
Total [a]	423,351	486,610	423,746	504,456	+0.1%	+3.7%

[a] Modal statistics are not additive. The model allows inter-modal transfers. In the case of maritime transport, all transit transit cargo most move by another mode in addition. Therefore the In and Out totals do not necessarily agree.

2.2 Lost Cargoes

The State Customs Service data are in sufficient detail to allow precise identification of 'lost' cargoes. The inverted commas are used because the word 'lost' is used as short-hand for a range of situations which include a decline in tonnages because a) a commodity is no longer being traded in such large quantities as before or b) global trading patterns have changed since 2007 so that Ukrainian routes are longer applicable.

The consultants' analysis reveals eight commodities which fulfil two criteria[3]:

- Transit volume has declined by at least 50% since 2007.
- That decline represents at least 100kt/year.

The commodities are as follows, defined by 2-digit HS codes and ranked by 'lost' volume in kilotonnes/year:

- Cereals[4] 3,825
- Ferrous metals 3,732
- Sugar and confectionery 706
- Miscellaneous (HS Code 99) 188

[3] There have been large absolute losses of oil (-33Mt/year since 2007) and some other bulk commodities such as ores (-6Mt) but they do not fulfil the 50% criterion.

[4] 2011 was the year of poor harvets in Ukraine and Russia, so grain exports were suspended or restricted.

- Ceramics 182
- Fruit and nuts 163
- Preparations of vegetables, fruit and nuts 150
- Glass and glassware 105

A similar analysis of countries of origin and destination shows that gains of more than Mt/year between 2007 and 2011 have been recored for 3 countries. The following figures comprise transit volumes (in kilotonnes/year) coming from and going to the listed countries via Ukraine:

- Italy 6,921
- Belarus 2,344
- China 1,359

Losses have been recorded for 16 countries:

- Russia 46,940
- Switzerland 8,676
- Slovakia 7,519
- Romania 5,928
- Poland 4,511
- Uzbekistan 4,347
- Hungary 4,218
- Turkmenistan 4,183
- Cyprus 3,991
- Kazakhstan 3,741
- Turkey 2,678
- Check Republic 2,347
- Tunisia 2,058
- France 1,810
- USA 1,501
- India 1,364

The lost cargoes to/from Russia are mainly bulk commodities. It is likely that a large proportion of the loss is attributable to

- Russia's policy of directing more of its trade through its own ports, for strategic as much as economic reasons.
- Creation of a Customs Union comprising Russian, Belarus and Kazakhstan, simplifying transit movements within these countries as well as promoting trade among them.
- Belarus's reported agreement to give Russian ports preference for Belarusian exports and imports.

These factors have nothing to do with a loss of competitiveness on Ukraine's part, and there is little likelihood of Ukraine's recovering these lost cargoes, no matter how thoroughly it implements recommended reforms, unless Russia's port capacity fails to keep up with growing demand or the Customs Union disintegrates. (It seems more likely that the Customs Union will expand, with Kyrgyzstan and Tajikistan as potential candidates.)

2.3 Consultations with Transport Operators

Transport operators on both sides of the Black Sea were consulted about the problems they face with respect to transit cargo and the opportunities they see for expanding transit traffic in the future, if those problems were effectively addressed. The information gathered from them is summarised here.

The main problems are generally well-known:

– Imbalance of demand for eastbound and westbound containers, leading to costly re-positioning of containers and inefficient stripping and stuffing of containers en route.

– Similar imbalance of demand for Black Sea ferry capacity, resulting in high costs to UkrFerry and consequently high tariffs.

– Progressive breakdown of the OSJD wagon-sharing agreement as railway operations in the member countries are increasingly privatised. Even though wagon-owners are paid rent for their wagons when retained by other railway operators for their own use, the general shortage of rolling stock makes them reluctant to let them out of their own control. The shortage of rolling stock is perhaps the main factor hindering development of rail transport throughout the CIS.

– High port charges, low productivity, long delays and pervasive corruption at Ukraine's ports (and at other ports, it should be said); exacerbated by making double calls at Odessa and Ilyichevsk.

– Uncommercial attitudes and management styles of state-owned enterprises which still control most transport facilities and services on Ukraine – Black Sea – Caucasus – Caspian routes.

– High overhead costs of UZ, which must be recovered through tariffs applied to traffic that is judged able to afford them. Labour (including social costs) accounts for over 40% of UZ's costs.

– Unpredictability of transit times and costs.

– The Russian policy of reducing its reliance on foreign ports.

– The creation of a Customs Union between Belarus, Russia and Kazakhstan, which other Central Asian counties may also join, which is likely to strengthen trade and transport links between those countries to the disadvantage of others.

However, there are positive developments and opportunities too:

– One operator predicted recovery of 120,000 TEU of annual container traffic if problems of Ukrainian Customs unpredictability and corruption could be overcome.

– The new Ukrainian Customs Code has generally been welcomed by importers, exporters and the freight transport industry, especially the provision for customs clearance anywhere within the country. (However, much will depend on how the Customs Service implements the Code.)

– Efforts to move towards single-window border control at Odessa have also met with private sector approval and are reported to be having a positive effect on the port's competitiveness.

– Improved customs procedures have also been credited, at least partly, for a substantial increase in Ro-Ro cargoes through Ukrainian ports, from 422kt in 2009 to 724kt in 2011 (+72% in two years).

– The Viking block train has increased the volume of cargo carried by 400% (to an average of 1,160 TEU per month) since regular thrice-weekly services were introduced; see Table 3 which shows a more-than-proportionate increase in the number of full containers passing through Odessa. It is not known what proportion of this is transit cargo; it is believed to be small. But the potential for greater transit volumes between the Black Sea and Europe has been demonstrated. Viking tariffs for loaded containers are as low as €0.21 (40-foot) or €0.35 (20-foot) per TEU-km[5]. See Appendix B for current tariffs.

Table 3: TEUs Carried by Viking Train in Ukraine

	2008	2009	2010	2011	2012
Total carried	6,070	6,012	4,083	3,585	13,885
Total number of full only	3,619	3,759	3,091	2,384	9,167
Total number of full from/to Odessa only	610	170	232	450	3,944

Source: LOGMOS Progress Report IV: Annex 'Maritime Sector Overview', April 2013.

- Substantial investment has been and is being made in Ukraine's international road corridors (see Appendix C), with financial support from EBRD, EIB and the World Bank. By 2016, 703km of the Kiev-Chop and 276k of the Kiev-Kharkiv road will have been rehabilitated at a cost of €1.52 billion; and a further €0.90 billion will have been spent on improving the approach roads to Kiev. In addition
- 4,646km of road have been identified for reconstruction under 13 toll concession arrangements and a pilot contract-maintenance project is planned for a 187km stretch of the Kiev-Lviv road.
- Current port developments on the Black Sea (Poti) and Caspian Sea (Baku/Alyat, Turkmenbashi, Aktau) and upgrading of the Caspian ferry fleet should enhance the competitiveness of the trans-Caucasus route.
- Transshipment of containers at Odessa is an attractive option with potential for some growth, eg from Trabzon (Turkey), Poti (Georgia) and Novorossysk (Russia), and earns good revenue for handling and short-term storage.

Mainly non-physical barriers and general uncertainty were named by operators as main factors preventing cargo flows from moving through Ukraine the effect of (partially) removing those can only be assessed. The improvements suggested by the operators could be summarised as follows:

- Enhancement of intermodal interfaces at potential transhipment points at borders
- Strengthening the connections to EU freight routes;

[5] These rates are for the full 1,734km route Klaipeda-Odessa, of which 756km (44%) is within Ukraine.

- Attraction of shorter transports between the countries around the Black Sea;
- Application of information technologies and services targeting awareness of logistics processes, available services along the route, regularity of operation and information exchange;
- Enhanced cooperation between logistics operators, cargo owners and authorities;
- Smoother border-crossings and reliability of cargos;
- Tighter commercial connection between TRACECA hubs, and EU-TRACECA hubs in view of generating future new cargo flows.

2.4 Competitiveness

Ukraine is in competition with routes to the north and to the south including:

- Baltic ports – Belarus – Russia – Central Asia – China.
- Constanza and Turkish ports – Black Sea – Caucasus – Caspian – Central Asia.
- Europe – Turkey (Bosporus Tunnel) – Caucasus (Kars rail link) – Caspian – Central Asia (the planned 'Silk Wind' service).
- Europe – Bandar Abbas (sea) – Central Asia.

Following analysis of Ukraine's competitive position, capitalising on findings presented in Ukraine's country profile report, recommendations of modal LOGMOS reports and action plan consideration, Ukraine would need to offer:

- Fast, cheap border crossings, free of artificial delays and corruption.
- Competitive rail tariffs together with predictable delivery times.
- Competitive port charges borne by shipping lines and shippers alike.
- Minimal port delays of any kind.

These views were also confirmed in interviews of TRACECA corridor users carried out under LOGMOS project mandate.

Progress is being made on customs procedures and other border formalities, but transport operators still complain of excessive waiting times and corruption.

Rail tariffs are reasonable on per tonne-kilometre (or per TEU-km) basis, but operational problems put rail at a big disadvantage to road. Much of this has to do with the shortage of rolling stock exacerbated by the privatisation process mentioned above, but UZ also suffers from a corporate culture that has not adapted sufficiently to modern market conditions. Moreover, as a state-owned enterprise it is difficult for UZ to escape certain social and political obligations, such as:

- Cross-subsidising passenger traffic from freight revenues.
- Subsidising some passenger categories for social or humanitarian reasons, without compensation from the State budget.
- Employing a larger workforce than may be necessary and providing social facilities for their employees as was normal in Soviet times.
- Maintaining parts of the network that may not be justified on purely commercial grounds.

However setting up LISKI as a separate entity, although wholly owned by UZ, to specialise in containerised cargoes may have allowed more competitive pricing in that sector.

Ukrainian ports have a reputation for being an expensive call for shipping lines. This is borne out by a comparison of 'disbursement account' costs[6] for a 53,000 GRT mother vessel (capacity: 5,300 TEUs):

- €19,000 at Ambarli;
- €36,000 at Constanza;
- €36,000 at Odessa; and
- €33,000 at Ilyichevsk.

The Ukrainian ports are individually competitive with Constanza, therefore, but since ships are required to call at both Odessa and Ilyichevsk the combined cost is 1.9 × Constanza's and 3.6 × Ambarli's.

The consultants have also made a comparison of port transit tariffs applicable to containers; see Table 4 below.

Table 4: Comparative Port Transit Tariffs for Containers (€)

`	Imports		Exports	
	20'	40'	20'	40'
Burgas	129	174	129	174
Varna	129	174	129	174
Trabzon	172	172	173	173
Batumi	135	178	135	178
Poti	138	181	138	181
Fos Sur Mer	181	181	181	181
Ambarli	na	na	200	200
Piraeus	247	247	223	223
Constanza	231	254	154	192
Thessaloniki	223	272	175	232
Novorossysk	300	319	281	300
Odessa / Ilyichevsk	269	350	na	na

Where there is a range of rates, the mid-point is shown.

Precise comparisons are hard to make because the services that are included may vary, and there are administrative charges which may vary within a wide range depending on circum-

[6] These are fees payable by a vessel to a port authority. They comprise Anchorage, Towage, Pilotage, Wharfage, Tonnage, Quay tariff, Lighthouse dues, Sanitary dues, Vessel Traffic Management System (VTMS) etc. These rounded figures were correct at 2011.

stances. The table is not definitive, therefore, but it is certainly suggestive that Ukrainian ports are among the more expensive[7].

It is reported that administrative charges are significantly higher at Odessa and Ilyichevsk than elsewhere. Charges for port infrastructure and customs clearance amount to between €140 and €360 per container, irrespective of size.

It is widely reported that delays in Ukraine's ports are excessive and unpredictable. But there are no reliable data from which to quantify this; and there may have been improvements since the new Customs Code came into force.

It is worth remarking that a substantial proportion of Ukraine's own imports and exports are routed through northern and Baltic Sea European ports in preference to the country's own ports. According to freight forwarders this is due to the high costs (including informal payments) and the long, unpredictable delays in Ukrainian ports.

[7] Container transit tariffs were collected in September 2012.

3 INCREMENTAL REVENUES

The consultants have information about revenues from various sources and in various currencies. In most cases the information is confidential. They have converted all to UAH and derived a set of average (or typical) rates, differentiated with respect to:

- Transport mode.
- Identity of carrier (UZ/private wagons, Ukrainian/foreign trucks).
- Commodity type (Bulk, Containers, Other non-bulk).
- Operation:
  - Line-haul transport.
  - Forwarding, handling and storage.
  - Transshipment at Odessa Port
  - Services (broadly defined to include government charges).

These rates are presented in Table 5. The table includes 'default rates' for use where there is uncertainty about the characteristics of a projected freight flow.

Table 5: Estimated Unit Revenues from Transit Cargo (UAH)

		Rail		Road		Trans-
	Unit	UZ wagons	Private wagons	Ukrainian trucks	Foreign trucks	ship-ments
Bulk cargoes						
Linehaul	NTK	0.16	0.14			
Forwarding/handling/s	tonne	20.00	20.00			
Services - commercial	NTK					
Services - governmen	NTK					
Containers						
Linehaul	NTK	0.22	0.19	0.50		
Forwarding/handling/s	tonne	75.00	75.00	75.00	75.00	100.00
Services - commercial	NTK			0.02	0.02	
Services - governmen	NTK			0.02	0.06	
Other non-bulk cargoes						
Linehaul	NTK	0.28	0.25	0.50		
Forwarding/handling/s	tonne	50.00	50.00	75.00	75.00	
Services - commercial	NTK			0.02	0.02	
Services - governmen	NTK			0.02	0.06	

Inevitably there has been a degree of simplification. In a free market there are as many rates for carrying and handling cargo as there are suppliers and customers. The figures presented in the table are the consultants' best estimates of rates that are typical in a majority of cases.

Line-haul rates are expressed in UAH per net tonne-kilometre (NTK). Tariffs per NTK vary according to the length of haul, of course. However, the main transit routes across Ukraine are at least 700km in length[8]. The rates used in the analysis are based on information from:

- UZ officials and the UZ Tariff Policy.
- Published rates for the Viking block train.
- Interviews with road transport operators and freight forwarders.

Some explanatory comments are necessary:

– According to the UZ's published Tariff Policy, tariffs for cargo (including containers) carried on privately owned wagons are slightly higher than for cargo carried on UZ's own wagons. But for containers carried on the Viking container block train they are 15% lower. This discount has been assumed to apply to all cargo in future, being more commercially rational.

– Revenues from forwarding, handling, storage and other services vary widely with circumstances. The figures in the table are default values estimated in the course of consultations with public and private sector stakeholders. They are averages that include cases where no handling or storage is involved. Because of the uncertainty the consultants have kept these estimates low to avoid over-estimation.

– Half of the forwarding/ handling/storage revenues associated with rail and road transport relate to movement through Odessa or Ilyichevsk and therefore accrue to the ports.

– However, in the case of foreign trucks a reasonable estimate has been made of the revenue per NTK from a) sales of fuel, other goods and services; and b) tax on those goods and services plus a transit fee of UAH0.10 or UAH0.20 per vehicle-km, depending on GVW.

– Container revenues are based on an average payload of 12.5t per TEU with an assumed 50/50 split between cargo carried in 20-foot and 40-foot containers.

– Two-thirds of containers carried by UZ are carried back empty, the tariff for empty containers being 50% of the tariff for full containers (as in the advertised tariff schedule for the Viking container block train).

– The average tariff for all rail-born containers is UZ's average tariff per container-km for carrying containers is 1.3 × the advertised Viking train tariff for basic 20' and 40' containers. This allows for higher pricing for other trains and for containers of other sizes and with special characteristics (eg temperature control).

[8] For example, 756km of the Viking train's route lies in Ukrainian territory.

4 INCREMENTAL COSTS

Every revenue-generating operation incurs some incremental cost. A set of average or typical unit costs is presented in Table 6[9]. As for revenues, these have been derived from a variety of sources, some confidential, and represent the consultants' best estimates after consulting:

- UZ officials and summary financial data supplied by them.
- Available data from other CIS sources.
- Interviews with road transport operators and freight forwarders.
- Research findings available online from EU and other international sources.

Table 6: Estimated Marginal Costs of Transit Cargo (UAH)

	Unit	Rail		Road		Trans-ship-ments
		UZ wagons	Private wagons	Ukrainian trucks	Foreign trucks	
Bulk cargoes						
Linehaul	NTK	0.12	0.09			
Forwarding/handling/s	tonne	10.00	10.00			
Services - commercial	NTK					
Services - governmen	NTK					
Containers						
Linehaul	NTK	0.12	0.09	0.40		
Forwarding/handling/s	tonne	37.50	37.50	37.50	37.50	30.00
Services - commercial	NTK					
Services - governmen	NTK			0.02	0.02	
Other non-bulk cargoes						
Linehaul	NTK	0.12	0.09	0.40		
Forwarding/handling/s	tonne	25.00	25.00			
Services - commercial	NTK					
Services - governmen	NTK			0.02	0.02	

Underlying these estimates are the following assumptions:

- UZ's marginal costs are slightly below its lowest freight rate.
- Marginal costs involved in forwarding/handling/storage are 50% of revenue, except for containers transshipped in Odessa or Ilyichevsk for which the proportion is 33%.
- The marginal cost of road maintenance attributable to the passage of heavy vehicles is UAH0.02/NTK. This is approximately equivalent to the tax collected on diesel fuel.

[9] These are marginal costs, or variabe costs, incurred in carrying an extra unit of cargo (tonne or NTK). They exclude fixed costs, or overheads, which do not vary with volume. Some costs (eg maintenance) consist of some fixed costs, which are dependent on the passage of time, and some costs which vary with the intensity of usage.

5 NET BENEFITS

The difference between Table 5 and Table 6 is represented in Table 7 below, expressed uniformly in UAH/tonne assuming an average haul of 1,025km. The table shows the accrual of net revenues to the various stakeholder classes: UZ, Ports, Private operators and Government. Depending on mode, commodity and route this benefit can vary between UAH70 and UAH210 per tonne.

Table 7: Estimated Net Revenues from Transit Cargo (UAH/tonne)

	Rail		Road		Trans-ship-ments
	UZ wagons	Private wagons	Ukrainian trucks	Foreign trucks	
Bulk cargoes					
To UZ	51	61			
To ports					
To private operators					
To Government					
Total per tonne	51	61			
Containers					
To UZ	140	140			
To ports			19	19	70
To private operators			142	39	
To Government				41	
Total per tonne	140	140	161	99	70
Other non-bulk cargoes					
To UZ	189	189			
To ports			38	38	
To private operators			0	0	
To Government				41	
Total per tonne	189	189	38	79	

The total net value of transit cargo depends on its volume, of course; and on the shares of the three identified cargo types and the five modes. The consultants have applied the following assumptions:

- The volume of bulk cargoes in transit are the least likely to respond to improved services and border-crossing arrangements. They are characterised by low unit values and consequently a low preference for speed and service reliability. No increase in bulk cargoes is assumed that could be attributed to the kinds of reform that are contemplated.
- 60% of any increase will be containerised, comprising 30% by rail (half in UZ's wagons, half in private wagons) and 30% by road (one-third in Ukrainian trucks, two-thirds in foreign trucks).
- 20% will be transshipped containers, brought to Odessa or Ilyichevk by sea, stored within the port territory, and then re-loaded onto another vessel.
- 20% will be uncontainerised non-bulk cargo, all carried by rail.

- The average transit haul is 1,025km, which is the median route length listed by UZ for 18 transit route/commodity combinations.

Applying these assumptions to Table 7 produces Table 8 which shows the accrual of net revenue to each of the identified stakeholder classes from 1 incremental tonne of transit cargo.

So, for example, UZ earns net revenue of UAH140 per tonne of containerised cargo carried in its own wagons. This kind of cargo is estimated to account for 15% of all incremental transit cargo attributable to the envisaged reforms. So Table 8 shows UAH140 × 0.15 = UAH21.

The last column of this table, headed 'Total', shows the total net revenue accruing to each stakeholder class from 1 incremental tonne.

The average net benefit to the Ukrainian economy is estimated at UAH131 (€13.80) per tonne of transit cargo with the assumed modal shares. The majority (62%) of net benefits accrues to UZ, followed by roughly equal shares to the ports (15%) and private operators (17%). The Government receives only 6%, but this may be an underestimate because only transit fees and taxes paid on fuel and other inputs bought on Ukrainian territory have been included. There are likely to be other, less direct benefits to Government.

Table 8: Net Revenue (UAH/tonne of total transit cargo)

	Rail		Road		Trans-ship-ments	Total
	UZ wagons	Private wagons	Ukrainian trucks	Foreign trucks		
Bulk cargoes						
To UZ						
To ports						
To private operators						
To Government						
Total per tonne						
Containers						
To UZ	21	21				
To ports			2	4	14	
To private operators			14	8		
To Government				8		
Total per tonne	21	21	16	20	14	
Other non-bulk cargoes						
To UZ	19	19				
To ports						
To private operators						
To Government						
Total per tonne	19	19				
Total						
To UZ	40	40				80
To ports			2	4	14	20
To private operators			14	8		22
To Government				8		8
Grand total	**40**	**40**	**16**	**20**	**14**	**130**

6 BROAD CONCLUSIONS

Non-bulk transit cargo in 2011 is estimated at 10,200,000t (see Table 1). If one supposes a 10% increase, with a strong bias towards containerised goods, the total net benefit to Ukraine would be UAH133 million (€12.5 million) per year.

Continuing growth can be expected in line with demand and Ukraine's ability to maintain and further improve its competitiveness as a transit country. Projected forward for 20 years at an annual real growth rate of 5%, and discounting to the present at 12%pa[10], the net present value of the increased transit traffic would be UAH1.37 billion (€129 million).

One could as easily suppose a 20% increase or a 50% increase in non-bulk transit cargo, with a proportional increase in the present value of projected net revenues. In any case, it appears that the modest costs involved in bringing about the recommended improvements and reforms, which mainly entail changes to policy and procedures, would be economically justified.

Instead of assuming and supposing, it would be better to identify specific cargo movements that would be amenable to attraction to a Ukrainian transit route. More precise estimates of marginal revenue and costs could then be made. But despite considerable effort, including running the FFM (see Section 2.1 above), the consultants are not confident of making such an identification.

However they are open to suggestions and, if relevant data can be supplied, are ready to refine and extend the analysis presented here.

[10] The discount rate most commonly used by international financial institutions in their project appraisals.

APPENDIX A: FREIGHT FLOW MODEL PREDICTIONS IN GRAPHIC FORM FOR 2020

Figure 1: Transit Freight Flows by Road: Do Nothing Case

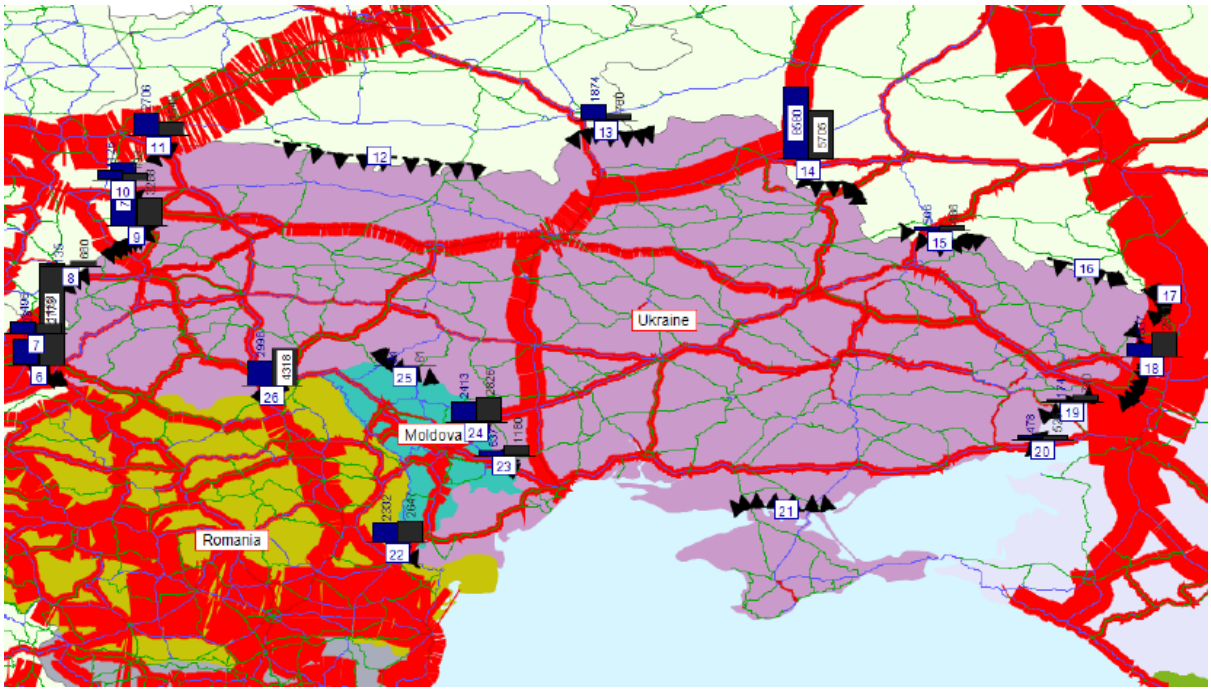


Figure 2: Transit Freight Flows by Road: Reform Case

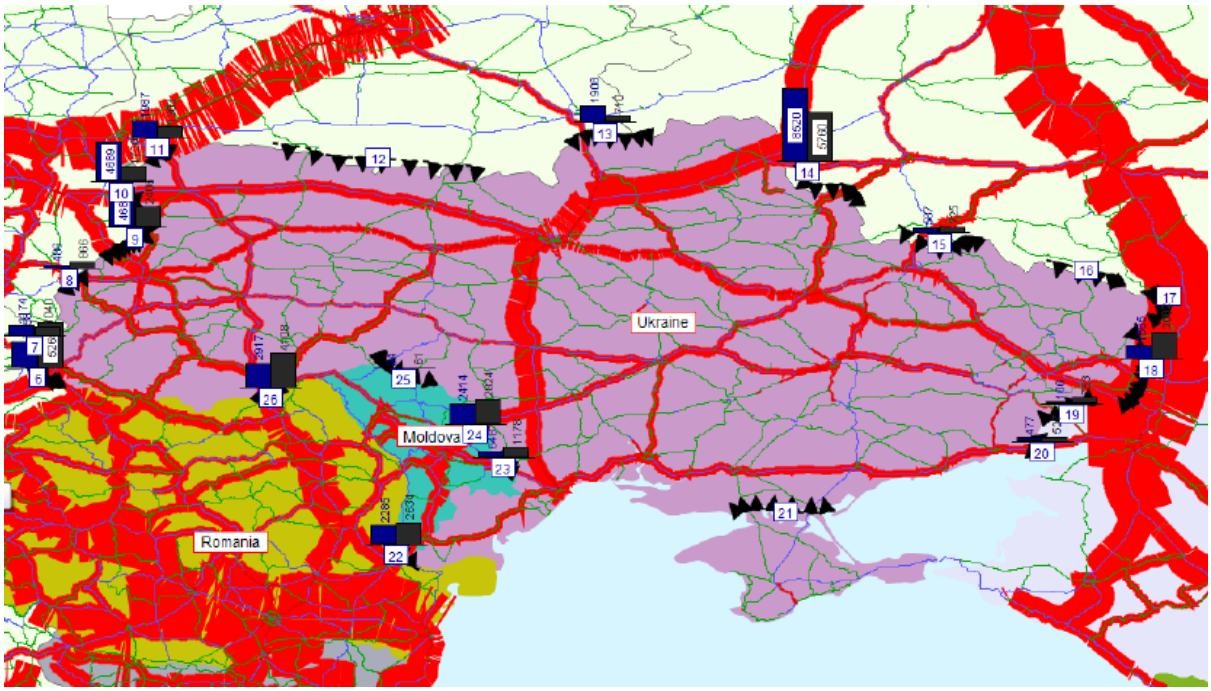


Figure 3: Transit Freight Flows by Rail and Sea: Do Nothing

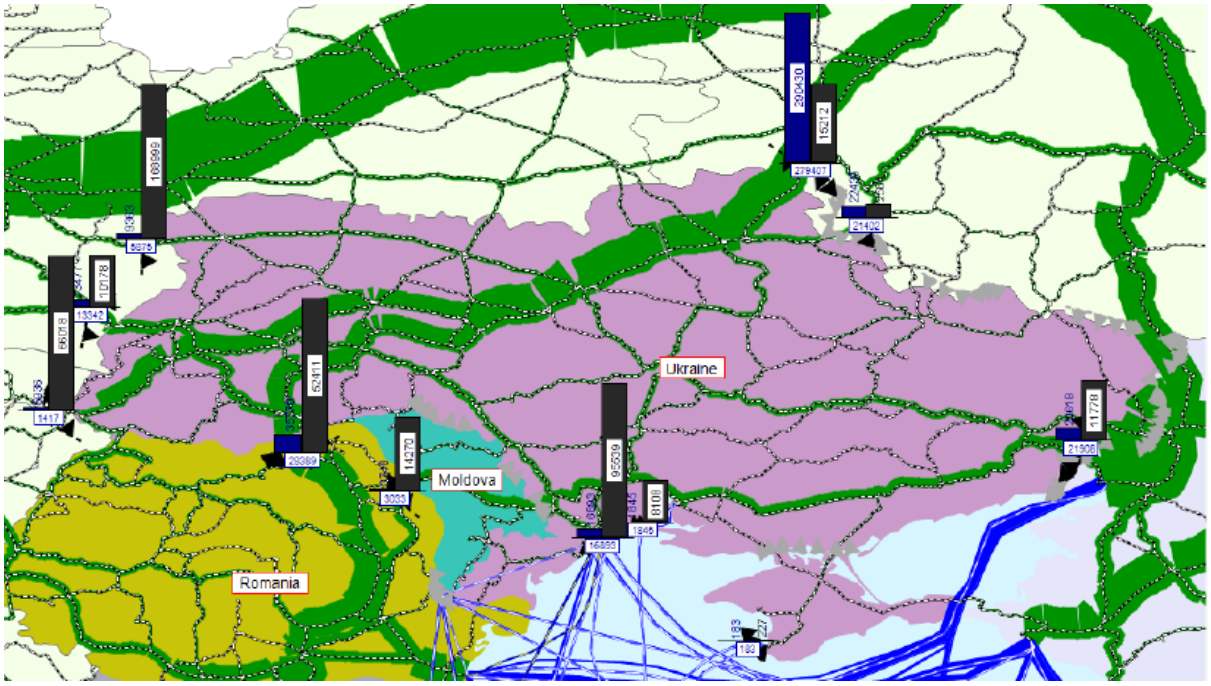
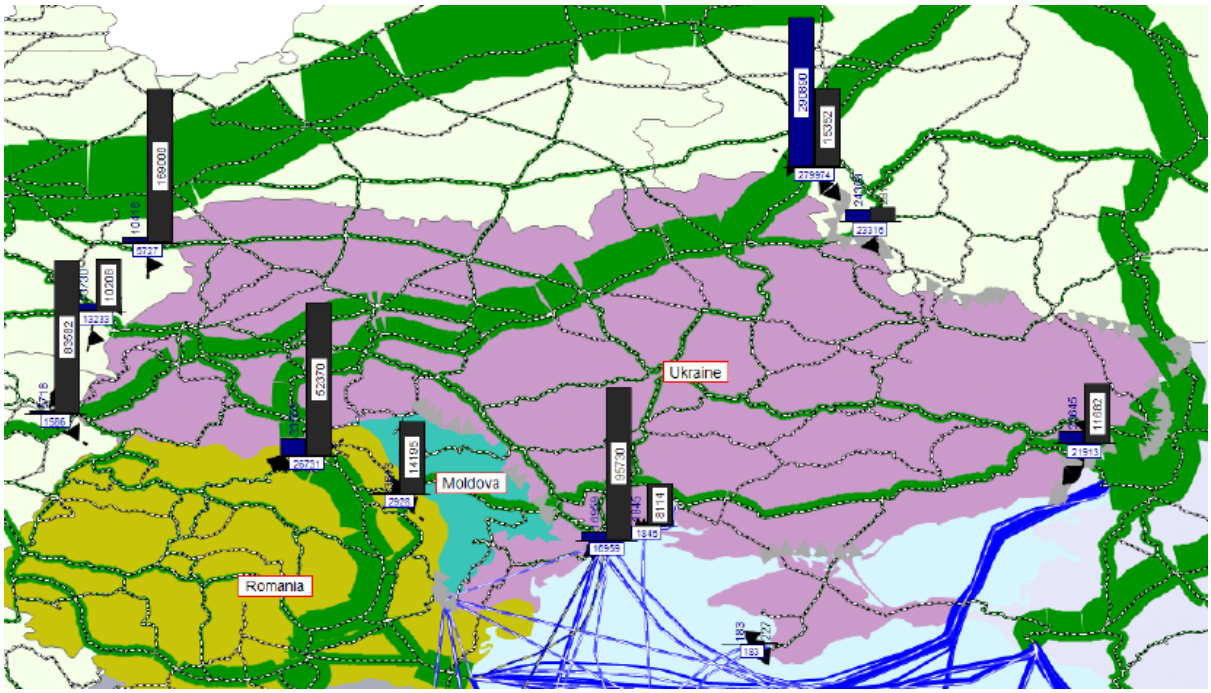


Figure 4: Transit Freight Flows by Rail and Sea: Reform Case



APPENDIX B: VIKING CONTAINER BLOCK TRAIN TARIFFS

USD/container

Route	Laden 20'	Empty 20'	Laden 40'	Empty 40'	Laden 45'	Empty 45'
Odessa/Illichivsk-Berezhest (ex)*	315	230	470	305	545	350
Odessa/Illichivsk- Koliadichi *	570	355	790	460	920	530
Koliadichi –Odessa/Illichivsk	550	355	775	460	905	530
Odessa/Illichivsk - Gudogai (ex)*	485	300	750	425	875	500
Odessa/Illichivsk- Draugiste (Klaipeda)*	610	360	965	525	1130	625

** rate includes rail consignment note and transit declaration issuance*

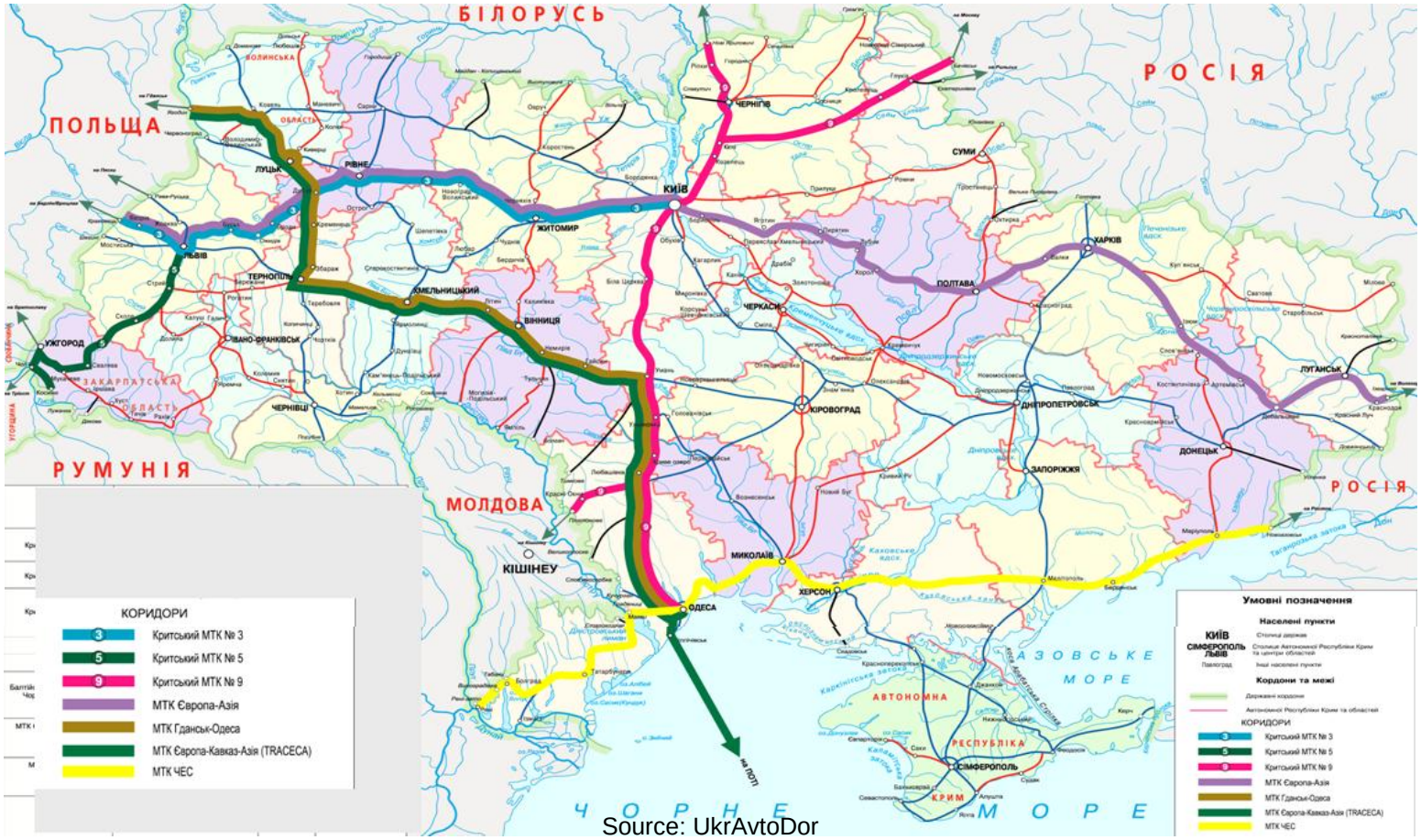
Route	Laden 20'TC	Empty 20'TC	Laden 40'TC	Empty 40'TC	Laden 20'RF	Empty 20'RF	Laden 40'RF	Empty 40'RF
Odessa/Illichivsk-Berezhest (ex)*	360	255	535	340	350	245	515	330
Odessa/Illichivsk-Gudogay (ex)*	560	345	860	485	545	325	825	465
Odessa/Illichivsk-Draugiste (Klaipeda)*	610	420	1110	605	690	395	1060	58

** rate includes rail consignment note and transit declaration issuance*

Route	Contrailer
Odessa/Illichivsk-Berezhest (ex)*	540
Odessa/Illichivsk-Gudogai (ex)*	770
Odessa/Illichivsk-Draugiste (Klaipeda)*	960

Source: Viking website

APPENDIX C: UKRAINE'S INTERNATIONAL ROAD CORRIDORS



Source: UkrAvtoDor