MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL AVIATION UNIVERSITY
Faculty of Transport, Management and Logistics
Logistics Department

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BACHELOR THESIS

(EXPLANATORY NOTES)

OF GRADUATE OF ACADEMIC DEGREE

«BACHELOR»

THEME: **«Organization of goods delivery in quarantine conditions»**

Speciality 073 «Management»

Educational and Professional Program «Logistics»

Done by Khomenko Maksym
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Standards Inspector Kaban N.D.
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Kyiv 2020

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ АВІАЦІЙНИЙ УНІВЕРСИТЕТ
Факультет транспорту, менеджменту і логістики
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ЗАТВЕРДЖУЮ
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ДИПЛОМНА РОБОТА

(ПОЯСНЮВАЛЬНА ЗАПИСКА)

ВИПУСКНИКА ОСВІТНЬОГО СТУПЕНЯ

«БАКАЛАВР»

ТЕМА: «***Організація доставки товарів в умовах карантину»***

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Київ 2020

NATIONAL AVIATION UNIVERSITY
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Academic degree Bachelor

Speciality 073 «Management»

Educational and Professional Program «Logistics»

APPROVED
Head of the Department

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«25» May 2020

TASK

FOR COMPLETION THE BACHELOR THESIS OF STUDENT

Maksym S. Khomenko
(surname and name)

1. Theme of the bachelor thesis: «Organization of goods delivery in quarantine conditions» was approved by the Rector Directive №553/ст. of May 04, 2020.
2. Term performance of thesis: from May 25, 2020 to June 21, 2020.
3. Date of submission work to graduation department: June 05, 2020.
4. Initial data required for writing the thesis: general and statistical information about impact of the global pandemic on the economies of countries and international transportation, information of the company «KYHM», production and financial indicators of the company «KYHW», literary sources on supply chain management and transport logistics, Internet source.
5. Content of the explanatory notes: introduction, analysis of the impact of the global pandemic on the economies of countries; scenarios of the influence of quarantine on the economy and industry; analysis of the effect of coronovirus on the activities of transport enterprises; general characteristics of KYHW Ltd; analysis of the main production and financial indicators of "KYHW" Ltd; shipping restrictions due to COVID-19 in international automobile transportation; self-isolation issues for drivers between trips after returning from abroad; organization of driver assignments for international routes.
6. List of obligatory graphic matters: tables, charts, graphs, diagrams illustrating the current state of problems and methods of their solution.

7. Calendar schedule:

№	Assignment	Deadline for completion	Mark on completion
1	2	3	4
1.	Study and analysis of scientific articles, literary sources, normative legal documents, preparation of the first version of the introduction and the theoretical chapter	25.05.20-27.05.20	Done
2.	Collection of statistical data, timing, detection of weaknesses, preparation of the first version of the analytical chapter	28.05.20-29.05.20	Done
3.	Development of project proposals and their organizational and economic substantiation, preparation of the first version of the project chapter and conclusions	30.05.20-01.06.20	Done
4.	Editing the first versions and preparing the final version of the master thesis, checking by standards inspector	02.06.20-03.06.20	Done
5.	Approval for a work with supervisor, getting of the report of the supervisor, getting internal and external reviews, transcript of academic record	04.06.20	Done
6.	Submission work to Logistics Department	05.06.20	Done

Student_____
(signature)

Supervisor of the bachelor thesis _____
(signature)

8. Consultants of difference chapters of work:

Chapter	Consultant (position, surname and name)	Date, signature	
		The task was given	The task was accepted
Chapter 1	Voitsekhovskyi V.S.	25.05.20	25.05.20
Chapter 2	Voitsekhovskyi V.S.	28.05.20	28.05.20
Chapter 3	Voitsekhovskyi V.S.	30.05.20	30.05.20

9. Given date of the task May 25, 2020.

Supervisor of the master thesis: _____ Voitsekhovskyi V.S.
(signature of supervisor) (surname and name)

Task accepted for completion: _____ Khomenko M.S.
(signature of graduate) (surname and name)

ABSTRACT

The explanatory notes to the bachelor thesis «Organization of goods delivery in quarantine conditions» comprises of 80 pages, 38 figures, 11 tables, 45 references, 1 appendix.

KEY WORDS: DELIVERY, GLOBAL PANDEMIC, QUARANTINE CONDITIONS, THE PROCESS OF TRANSPORT ORGANIZATION, TRANSPORTATION

The purpose of the research is to study the theoretical foundations and problems of the organization of goods delivery in quarantine conditions, the impact of the global pandemic on the economies of countries and international transportation, and to develop project recommendations of the organization of goods delivery in quarantine conditions for “KYHW” ltd.

The subject of the investigation is the organization of effective work with drivers on international traffic in quarantine conditions.

The object of the research is the processes of organization of goods delivery in quarantine conditions for «KYHW» Ltd.

Methods of research are scientific inquiry, empirical, analysis and synthesis, modeling, expert assessments, extrapolation of time series.

Materials of the thesis are recommended for use during scientific research, in the educational process and in the practical work of specialists of logistics departments.

CONTENTS

NOTATION

BNSF – Burlington Northern Santa Fe Railway Company;

COVID – Coronavirus disease SARS-CoV;

GFC – The Global Financial Crisis

LTD – Limited company;

LTL – Less-than-truckload shipping or less than load;

TEU – Twenty-foot equivalent unit;

TI – Transport Intelligence.

INTRODUCTION

The pandemic-induced clampdown of geographical corridors and restrictions imposed on cross-country mobility of goods are some of the factors that are carrying serious implications for the freight and transportation industry. A sudden slump in demand owing to the slowdown in economic activities across the key end-user sectors and restricted passenger mobility have eschewed growth prospects in the freight and transportation industry.

However, suppliers in the freight and transportation industry have the inherent bottlenecks within global goods supply chains to address which have gotten worse with the intensifying coronavirus impact.

Buyers and suppliers are expected to collaborate to address this overwhelming coronavirus impact on the freight and transportation industry. This is the need of the hour as their services are considered critical to cater to emergency requirements from healthcare/government agencies. Such initiatives will also assist them to generate additional revenue streams which are currently rare in this economy that is reeling under the coronavirus impact.

Governments across countries have stepped in to revive the ailing enterprises in the freight and transportation industry as the demand curve has taken a nosedive owing to the coronavirus impact. The airlines industry is among the worst-hit sectors and has resorted to employee lay-offs and downsizing fleets as cost-saving measures. From a procurement standpoint, it is prudent of buyers to leverage forward contracts with suppliers to ensure normalization of supply post the COVID-19 crisis.

Demand-supply trends in the travel sector:

– Suppliers are expected to collaborate with governments to assist in emergency operations by integrating their capabilities with national emergency mechanisms and systems. While accounting for a major contribution towards the national need, this collaboration can translate into sources of substantial revenue in the freight and transportation industry.

– Global travel organizations are partnering with health organizations to strategize a recovery strategy post the COVID-19 crisis. Major buyers should work in a collaborative manner to assist such agencies to evaluate and develop key risk mitigation/recovery strategies post the COVID -19 crisis

Demand-supply trends in the freight and logistics sector:

– Ports and terminal services have functioned in a normal manner, albeit with substantial human resource safety measures in place. Suppliers were facilitated by additional storage capacities by port authorities whenever deemed necessary. This has eased the burden on suppliers in terms of inventory handling costs and consequently led to a downward price push for buyers.

– Suppliers have actively formed coalition groups, wherein macro-economic issues faced by them due to the coronavirus impact are collectively presented to various government agencies. Consequently, charges such as those associated with detention and demurrage are being conditionally waived off for suppliers.

Urgency of the research is due to the nature of the coronavirus impact on the freight and transportation industry and the interdependence between buyers and suppliers in this industry reinstate the importance of collaboration between both the parties to identify issues associated with transportation activities. One of the major areas where buyers and suppliers can collaborate in an effective manner is to constantly monitor new areas where quarantine measures are being deployed and identify alternate travel routes effectively.

The purpose of bachelor thesis is the organization of goods delivery in quarantine conditions and project proposals development to increase the efficiency in international transportation.

The following scientist and researchers focused their efforts on transport logistics: Tereshkina T.R., Baranova L.E., Voinova L.V., Pogorelceva Yu.A., Sheiner N.Yu., Klunko A.N. [19], Grigorak M.Yu. [14], Prunenko D.O. [26], Postan M.Ya., Moskvichenko I.M., Balobanov A.O. [28]

In accordance with purpose of thesis was defined and formed the follow tasks:

1. Consider theoretical basics of the organization of goods delivery in quarantine conditions.

2. Breakdown of legal basis of transportation in quarantine periods.

3. To study global modern situation in logistics after world pandemic.

4. Study current situation of transport market in Ukraine.

5. Describe general characteristic of “KYHW” Ltd.

6. Carry out analysis of the “KYHW” Ltd business indicators.

7. To make the recommendation of the organization of goods delivery in quarantine conditions for “KYHW” Ltd.

8. To solve the self-isolation issues for drivers between trips after returning from abroad.

9. To organize the drivers for international routes.

The object of research was the processes of organization of goods delivery in quarantine conditions for «KYHW» Ltd..

During the performance of the thesis was used general scientific methods: system analysis, induction and deduction, analyze and synthesis, expertise. During calculation of economic effectiveness of the project was used assignment task from operations research.

The information sources during thesis research were:

–regulations and legal documents;

–scientific and methodological development of international transportation;

–statistics and financial report of “KYHW” Ltd, internal documents that describe company’s activity;

–Internet sources.

During carrying out calculations and edition of thesis was used Microsoft Office software applications: Word, Excel and Visio.

CHAPTER 1
THEORETICAL BASIS OF THE ORGANIZATION OF GOODS DELIVERY IN QUARANTINE CONDITIONS

1.1 Effects of Covid-19 on transportation modes

As the COVID-19 situation evolves, disruption continues to impact transportation and supply chain networks. However, decreased volume and increased consumer demand aren't the only factors at play. Each transportation mode such as rail, ports, air, and trucking is experiencing varying levels of delays, restrictions, and workforce capacity issues. These sudden shifts in normal operations are disrupting industries and employees working to keep essential goods moving through the supply chain.

Overall, truck freight has slowed down following an initial spike at the beginning of the pandemic. However, the federal and state governments are pushing to keep the supply chain moving despite tightening truckload capacity.

How have truck drivers been affected? [33]

1. Commercial truck drivers were exempt from the non-essential business closures and stay-at-home orders implemented by most states.

2. Truck drivers have reported long wait times at pickup and delivery points due to decreased on-site personnel and busier receiving schedules.

3. Some carriers are waiving physical signatures on LTL and small parcel shipments; however, drivers are still expected to record the time, any exceptions, and name of the consignee. [2]

4. Truck drivers are less willing to book loads to hard hit areas causing spot market and ad hoc rates to climb. [2]

5. Amenities such as food and restroom stops are becoming a challenge to truck drivers along certain routes.

6. Across the US, there's been a significant drop in volume in lanes that normally have freight.

7. Less-than-truckload (LTL) freight cannot be held in destination terminals due to limited space, resulting in extra fees. Many LTL carriers are then returning freight less than one day after a load cannot be delivered to a closed facility. [2]

Port Cargo. According to global transport and logistics company, Kuehn + Nagel, port terminals are prioritizing essential products such as medical goods over other shipments, however cargo remains flowing into the U.S. and Canada. In addition, the majority of East Coast ports have maintained normal operating hours, while some ports and container freight stations have seen reduced hours or temporary closures. The Port Authority of New York & New Jersey announced they have remained open and operating under normal conditions while their marine terminal operators, longshore labor, and warehouse/distribution center operators are working to support the 28 million consumers in the hard-hit region.

What else have ports been experiencing during this time?

1. Cruise ship terminals have been hit hard as movement is a significant component of revenue for Southern ports like Miami and Tampa. [2]

2. According to recent data from New Harbor Consultants, Pacific Coast ports experienced 20% lower import TEUs in Long Beach and Los Angeles compared to the year-earlier month.

3. The table below shows volumes were still growing on the East Coast in February, up almost 14% in Savannah and Charleston.

Port Loaded TEUs – Feb 2020 Changes vs. Prior-Year Month % is presented in table 1.1 [41].

Air Cargo. Right now, the air cargo industry is out of tune as global supply chains are tightly interdependent. According to freight forwarder, Agility Logistics, air cargo capacity out of China was off 39% in February. As China's supply chain aims to get back on track, rates for moving goods will continue to climb. It's impossible to predict when capacity will stabilize but premium levels may be seen for some time.

Table 1.1. – Port Loaded TEUs – Feb 2020 Changes vs. Prior-Year Month %

№	Location	Import	Export
1	2	3	4
1.	Long Beach	-17.9	+19.3
2.	Los Angeles	-22.5	-5.7
3.	Oakland	-9.2	+15.4
4.	Northwest Seaport	-8.0	+4.5
5.	Vancouver	-11.8	-8.6
6.	Houston	+3.4	+28.2
7.	Savannah	+13.6	+19.7
8.	Charleston	+13.5	+19.6
9.	Virginia	Not Available	Not Available
10.	Baltimore	-12.8	+8.0
11.	NY-NJ	+1.7	+0.4

Source: New Harbor Consultants External Link

How have travel restrictions played a role in air cargo shipments?

1. Trade flows are still operating with reduced staff and/or work-from-home policies despite travel restrictions.

2. Passenger planes have started to move air cargo as ship and rail decreases.

3. Europe and North America's trade lane is dominated by passenger aircraft so there has been a decrease in available capacity.

4. There is limited available capacity in the overall market as airlines cancel flights and some freighters.

Rail Freight. In the midst of the ongoing crisis, rail car volume continues to be on par or slightly below year-over-year activity. Railroad giants, BNSF and Union Pacific, felt an initial shift as they would have handled China's imports. Across the U.S., rail car storage is in demand, especially tanker cars that carry and store crude oil.

While it's still uncertain how the rest of the crisis will play out, we will continue to see prolonged effects from COVID-19 throughout all areas of the supply chain.

The transportation industry has plenty of experience when it comes to disruption and changing environments, but its fast-paced and adaptable nature puts it in a solid position to continue to weather the evolving situation [34].

The European road freight market could shrink by almost 20% this year, due to the coronavirus pandemic.

In new research from Transport Intelligence (Ti), published today, Ti's original forecast of 2.1% growth in Europe's road freight has had to be radically revised with the outbreak of Covid-19 and the subsequent social lockdown.

It says the best Europe's road freight operators could hope for now would be a 4.8% contraction, and in the worst case it could be a 17% contraction, which it described as "far worse than the great recession of 2008/9".

However, the broad projections also mask significant variations across geographies and verticals.

The big five European markets – Germany, the UK, France, Spain and Italy – are projected to suffer a cumulative decline of 5.6% in the best case, and 21.3% at worst.

The variation largely depends on how long lockdowns continue and their effect on demand. "The analysis shows that deviation from the expected pathway of recovery could, in extreme circumstances, see more than one-fifth of the big five's combined market value erased this year.

The 'severe impact' scenario assumes that, essentially, the lockdown measures introduced during March across much of the region remain in place for much of the year, an increasingly unlikely outcome.

Ti previously forecast that the five markets would see a combined growth of 1.4%, but with key industries such as automotive manufacturing effectively shuttered by the pandemic, road freight operators have been subject to wild fluctuations in demand.

Particularly large impacts on the German market, but has also pushed knock-on effects into Central Europe that supply the operations. By the third week in March, production had largely come to standstill. This will have been serious for the large LTL network providers, as they are heavily reliant on the automotive sector to provide a 'base-load' for the network.

Similarly, the apparel and footwear sector has seen demand drop by more than half across Europe, far more in Italy and Spain, while supply of these products has been hit by sourcing issues in Asia.

And even the grocery distribution sector, the focus of so much attention in the early days of lockdown, is beset by considerable uncertainty, and "has varied from

economy to economy as the Covid-19 crisis has developed, with the UK and the Netherlands in particular, seeing ‘panic-buying’.

The situation in France, Italy and Spain has swung from panic buying to collapse very rapidly, with falls in demand and violent changes in the behaviour of the supply chain, often due to disruption in accessing supply.

The question here is, how effective has been the redeployment of capacity from other market segments into grocery?

As economies begin to emerge from the emergency phase of the pandemic, Ti predicts, grocery demand could collapse, while “prices jump in other areas such as consumer durables or clothing as the market recovers rapidly and retailers look to replenish stock”. [37]

Coronavirus seems unstoppable. The virus that originated from China not only has had a fatal impact on people’s lives but it is also threatening the entire transport world, as bans and border closures are being applied. One of the most important is that one of Italy, where from this March 10th, mobility is restricted throughout the country. Since February 2020, many things have changed and will keep constantly changing because of the coronavirus and its effects on the transport industry. Moreover, outside the European borders the situation remains critical in some countries of the Mideast, creating troubles on intercontinental transport.

Transport in any form is being affected. The Association of European Freight Forwarders Clecat and the Polish Chamber of Forwarding and Logistics have raised their warnings about the limited export loads and the extra delays of port operations due to the lack of transshipment operators and warehousemen. Eastern countries are also starting to notice the intensification of limited transport due to the coronavirus, making the European economic black whole bigger and stronger. Delayed deliveries and increased prices because of the coronavirus.

Combining the fact that the number of goods imported is limited along with the shortened routes the transport companies carry out, we can be prepared for some big changes on a trade level as a result of the COVID-19 outbreak. As the expert Jerome de Ricqles estimates, that in a not so distant future, the inability to cover the demand

will result in an increase of freight rates and the overall transport costs by the end of March. Inevitably, this will have a direct impact on the final prices of goods.

Let's be clear, China is a very big supplier in a worldwide level and many transport companies within Europe get to transport goods that carry the "Made in China" label. Given the fact that the country is facing bans and border closures, exporting becomes more complicated for both sides. As a result, a significant number of containers full of merch produced in China, are immobilized due to the COVID-19 outbreak.

Despite the coronavirus outbreak in December 2019, China is starting to reopen its factories. It feels rather optimistic to see that for the electronic machinery goods, country's largest export, the resumption rate of factories are 90% in Zhejiang (as of February 20), over 60% for Jiangsu (as of February 16) and Guangdong is at around 50% (as of February 19), as brought by Ganyi Zhang. These number definitely give high hopes, but there's still a long way to go until the whole industry restores back to its full capacity.

Trying to maintain calm, the European authorities are taking very seriously the threat posed by the coronavirus to the entire continent. Since the beginning of the crisis blunt measures are being taken in order to stop the expansion of COVID-19 within European borders. These preventions are already directly affecting the transport of goods by road, especially in places where more cases have been registered. A great example is northern Italy or the borders with the Asian countries.

More precisely in the transalpine country, the most restrictive decisions have been already taken, to control the epidemic menace. This on its way has been having a series of important consequences for transport.

After several containment measures, the Italian Government has taken another step and has decided to "isolate" the whole territory, including Milan, nation's most powerful economic engine. These severe measures will be extended, for the moment, until April 3, directly affecting millions of people and therefore the entire country. In the case of transport, the situation is that "any displacement" of entry and exit of the territory has been banned except for "non-extendable labor requirements or emergency

situations". What this restriction mean for the professional drivers is that "cross-border workers will be able to enter and leave" to carry out their work and return to their countries of origin unless the people who travel are subject to quarantine or have tested positive for the virus.

What does the coronavirus mean for drivers? In these regions it is mandatory to carry out medical checks on drivers (taking the temperature and evaluation of symptoms) at the loading and unloading points. In some more extreme cases carriers are even required to wear a mask, something that many of them have already denounced the Italian transport associations for.

By wanting to reduce risks and given the fact that the situation is already much complex, Italy, claiming health reasons, decided to momentarily cancel the Schengen Agreement by closing its borders so that they can establish medical controls at the access points. Although we are currently far from that scenario, the situation changes day by day.

Italy is, as we say, the most affected country in the European Union, but the cases registered in all the surrounding countries are increasing. In Spain, hundreds of confirmed cases (mostly minor) have already been exceeded, with outbreaks in Madrid and the Basque Country. And although no preventive restrictions have been taken yet, it could eventually occur in case of a drastic increase in contagions.

The slowdown that all these measures are assuming is undeniable, at all levels. In fact, and focusing solely on the transport of goods by road, we must not only meet the direct costs of these restrictions. What we also need to take into consideration are all the indirect ones, starting with the shortage from the points of origin, which necessarily implies a lower need for loads, up to economic losses that these adversities may suppose to the transport companies, being able to undertake cuts in their budgets.

Taking into account that the number of cases will not stop growing for the moment, it becomes more important to provide proper information on the evolution of the coronavirus. Of course, we need to be cautious not to fall into sensationalism and avoid making decisions that may be irreversible for certain sectors. Prevention is definitely key and a favorite alternative that many countries use when it comes to

treating this global agitation. However, commerce will never completely freeze and as it happens in all such cases, after a couple of months, the coronavirus will be a bitter memory for all of us to recall. [41]

The global air cargo market saw a 4% year-on-year decline in the four weeks to February 2, 2020, according to the latest 'dynamic load factor' market intelligence from CLIVE Data Services. The dynamic load factor fell two percentage points relative to last year to 65% (fig. 1.1).

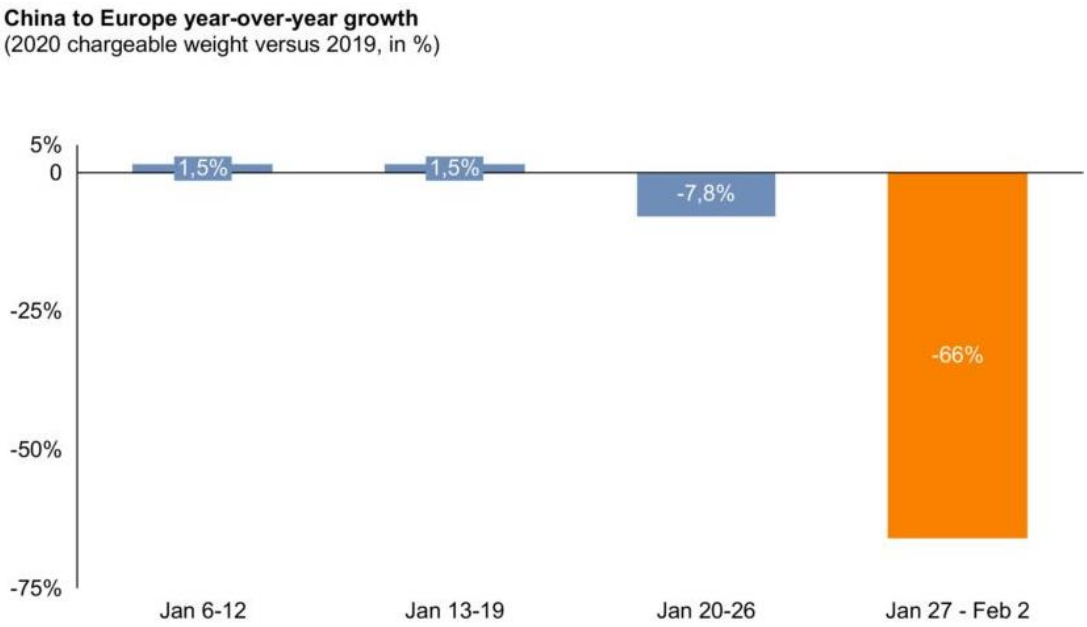


Figure 1.1 – The dynamic load factor [37]

CLIVE's first-to-market analysis each month consolidates data shared by a representative group of international airlines operating to all corners of the globe. Based on both the volume and weight perspectives of the cargo flown and capacity available, it gives the air cargo industry the earliest possible barometer of market performance each month.

Change in load factor percentage points versus 2019 is presented in fig. 1.2.

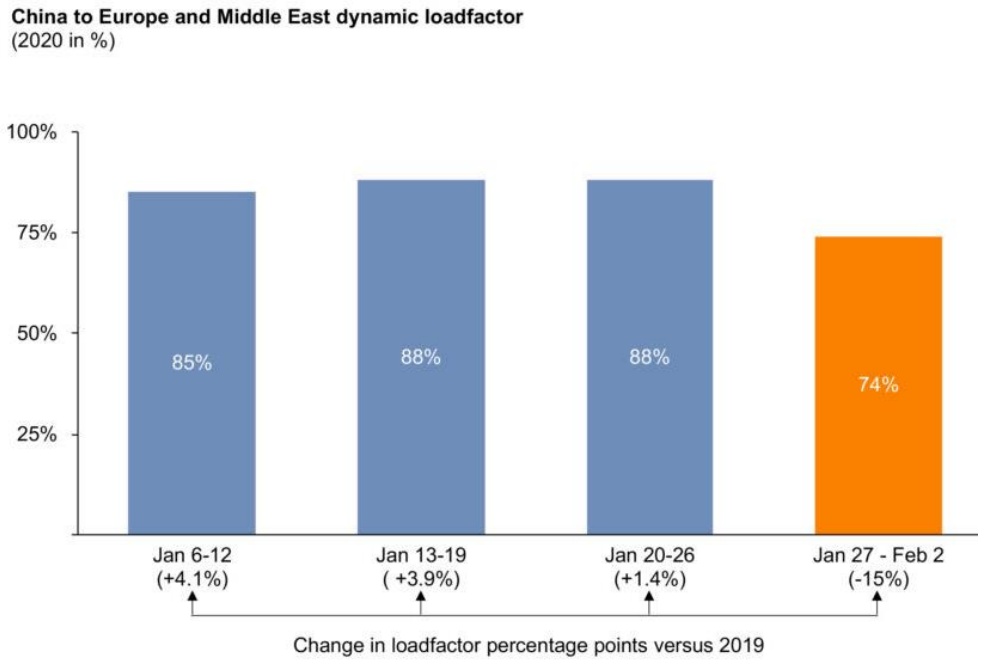


Figure 1.2 – Change in load factor percentage points versus 2019 [37]

Four-week data to February 2 largely reflects the influence of the earlier Chinese New Year but CLIVE is also closely monitoring the impact of the coronavirus on airfreight volumes, which will be clearly evident in its data reports over the coming weeks.

For a regional holiday to have such an impact on global volumes, the drop must be quite dramatic. In the last week of January, volumes from China to Europe, relative to the same week in 2019, dropped by 66%.

Subsequently, the dynamic load factor of westbound flights from China dropped from close to 90% to 74%. The reason for the load factor not dropping further is due to airlines cutting capacity by 44% relative to the same week last year. Most of this fall in capacity was caused by a reduction of freighter services in anticipation of the weaker demand.

The impact of the coronavirus on cargo volumes out of China will become clearer in the weeks to come when the factories reopen and their supply chains are brought up to speed again. How quickly that will happen – and what knock-on effects it has for global air cargo industry – will be a strong indicator for the year ahead.

1.2 Analysis of the impact of the global pandemic on the economies of countries

Around 170 countries now have confirmed cases of COVID-19. Inside China the number of new infections has rapidly slowed down, but there are major outbreaks in Italy, the United States, Spain, Germany and Iran. New infections in Europe and the United States are likely to increase exponentially over the coming weeks, while clinical trials and approval processes for the antiviral drugs and vaccinations currently in development may take several months yet.

One thing is clear: GDP is currently taking a severe beating. However, the size of the impact in different parts of the world will depend fundamentally on how long the present economic disruption lasts. We foresee a drop in GDP growth in 2020 compared to the pre-crisis base case ranging from 1.9 to 7.1 percentage points.

China is further along the coronavirus curve than Europe and the United States. The government's actions have been effective, quarantine measures have been gradually lifted and social and economic life is slowly returning to normal. In the event of a four-week economic disruption, China will feel the effect of closures of production sites and lack of demand from the United States and Europe, but production will quickly return to normal driven by pent-up domestic demand and demand from key trading partners post-lockdown (Japan, South Korea). The result will be a drop in GDP growth of just 1.9 percentage points in 2020 compared to the pre-crisis base case. In the event of a 12-week economic disruption, European and US demand will remain in the doldrums for longer and domestic demand will not completely compensate for this, leading to a drop in GDP growth of 3.3 percentage points.

If mitigation actions by governments in Europe are effective, we could see the number of new infections declining here at the beginning of Q2 2020. A four-week period of economic disruption will mean negative growth in Q1 and Q2, i.e. we will have a recession and GDP growth for the whole of 2020 will be down 3.4 percentage

points. Should the disruption continue for 12 weeks, on the other hand, we foresee a steep drop in growth in Q2 2020, with the closure of many non-essential production sites and a substantial increase in unemployment, especially in the services sector. In this case GDP growth for the year could be hit by as much as 5.8 percentage points.

Four weeks of economic disruption in the United States will mean a temporary halt in production by some manufacturers and a dip in consumer confidence. The recovery will then be driven by the strong US economy, consumer spending, public investment and government relief packages. The result will be a 4.2 percentage point drop in GDP. With 12 weeks of disruption, recovery with positive growth rates will not occur before Q4 2020, production will see lengthy delays, layoffs will drive down consumer demand and asset and credit bubbles may burst. In this scenario GDP growth could dive by as much as 7.1 percentage points.

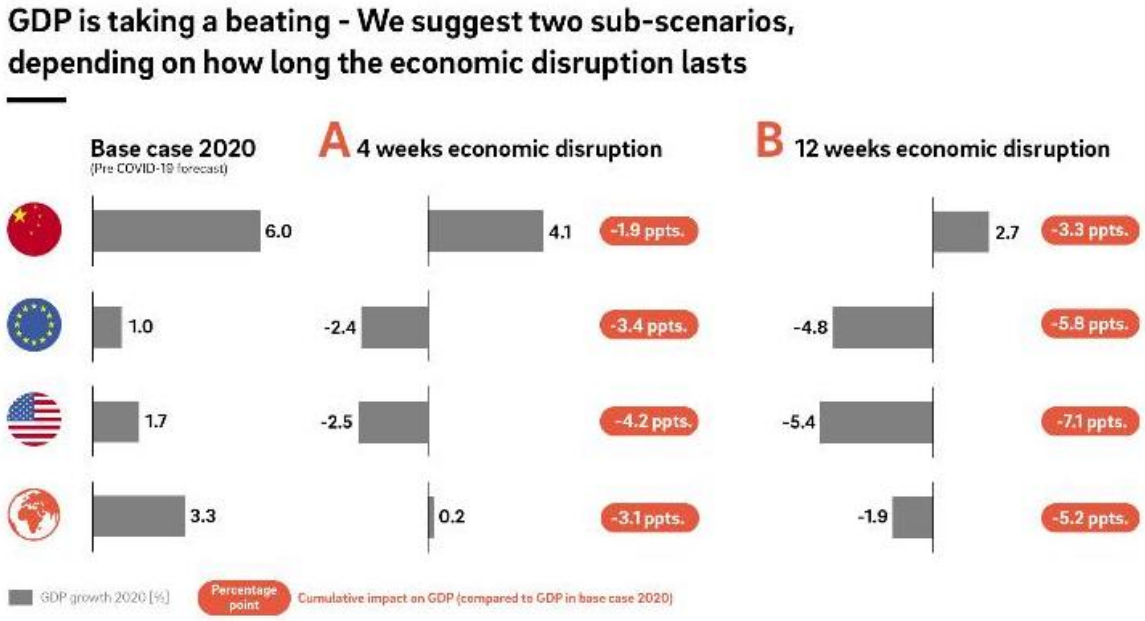


Figure 1.3 – GDS and COVID-19 influence [41]

Whether the economic disruption lasts four weeks or twelve, the impact on industry will be two-fold, affecting both annual profitability and short-term liquidity. Tourism and travel, the airline industry and retail (excluding FMCG) will be hit strongly on both fronts, putting them in the upper right-hand quadrant of our coronavirus impact matrix below. Thus, tourism and travel have already experienced short-term cancellations and a sharp drop in cash inflow as new bookings for June to

August evaporate. The industry has limited options for catching up after the crisis has ended, putting 2020 results under immense pressure (fig. 1.4). In the airline industry, last-minute cancellations combined with a tendency towards flexible bookings have led to a cash shortage; the long-term financing of aircraft limits the possibilities for adjusting cash outflow accordingly. Profitability will be impacted by the industry's close correlation with tourism and travel. Non-FMCG retail is seeing drastically reduced demand, leading to a shortfall in sales.

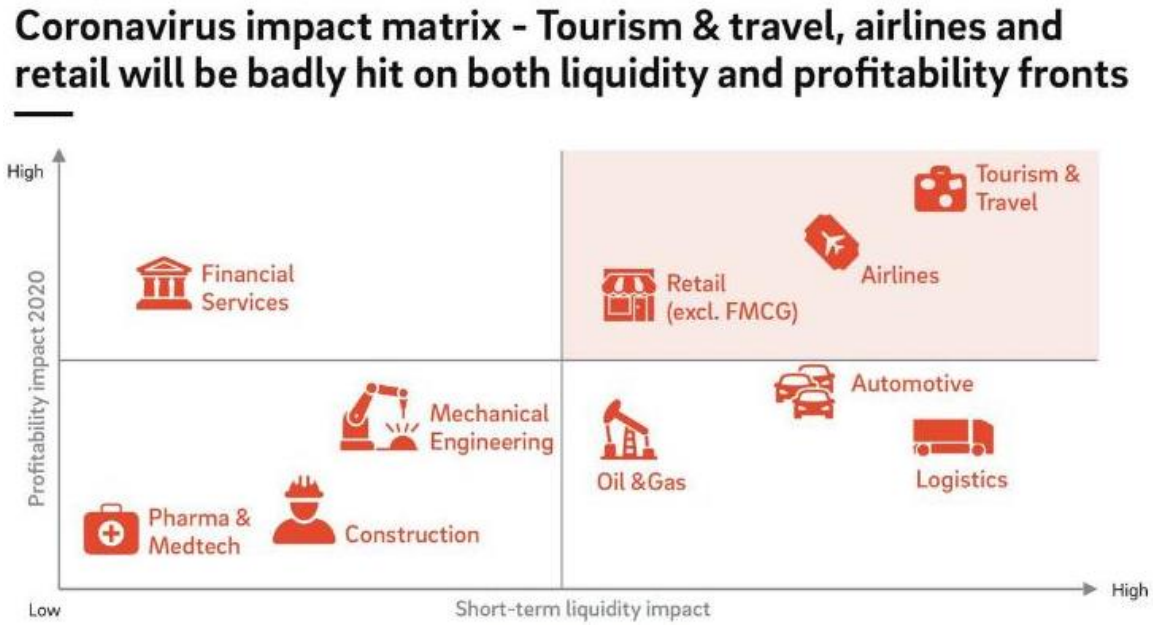


Figure 1.4 – Coronavirus impact matrix [41]

The logistics industry is seeing a big drop in profitability as production stops, but the rebound effects when the situation relaxes will allow for partial catch-up. The oil and gas industry has been through crises before and enjoys some flexibility due to third-party oilfield services. However, its liquidity situation is exacerbated by the current price war between Saudi Arabia and Russia: With an oil price of 30 USD/bbl, upstream free cash flow is close to zero.

The financial services industry will be less impacted in terms of short-term liquidity, but 2020 results will come under pressure. Low interest rates and monetary policy measures will provide financial aid during the crisis, although the inevitable bankruptcies will lead to reduced cash inflows for the industry. Profitability for the

year will be affected strongly by the depreciation of distressed and bankrupt corporate financing, while regulatory requirements on core capital may lead to fire sales of credit portfolios.

1.3 Scenarios of the influence of quarantine on the economy and industry

COVID-19 has spread to more than 110 countries so far, with many seeing a steep rise in new infections. While vaccines are in development and initial treatments are showing some signs of success, the potential human impact of the disease is immense and a cause for global concern. Besides this human impact, the coronavirus also has the potential to trigger an economic crisis. Analysts currently expect to see a negative impact on all sectors of the economy, from bottlenecks in logistics and plant shutdowns to downturns in business investments and consumer spending [33].

A severe blow to GDP growth. In China, the focal point of the coronavirus outbreak, we forecast that GDP growth could drop as much as 3.5 percentage points in 2020 in a worst-case scenario. Our "Profound Recession" scenario further foresees a second wave of the outbreak in early 2021, with new flare-ups outside the Hubei province and quarantine measures extended to other regions. Supply will be severely disrupted, with factories remaining closed and numerous bankruptcies, while fiscal and monetary policy responses will not start pushing growth until Q3 2020. In our more moderate "Delayed Cure" scenario, the number of new infections will slow down but quarantines will remain in place, causing bottlenecks in supply and a downturn in domestic demand and exports. In our most optimistic, "Fast Recovery" scenario, the Chinese government's measures would be effective, quarantines quickly lifted and production soon return to normal, leading to just a short-term dip in demand. Scenarios ranging from a fast recovery to a profound recession are presents in fig. 1.5.

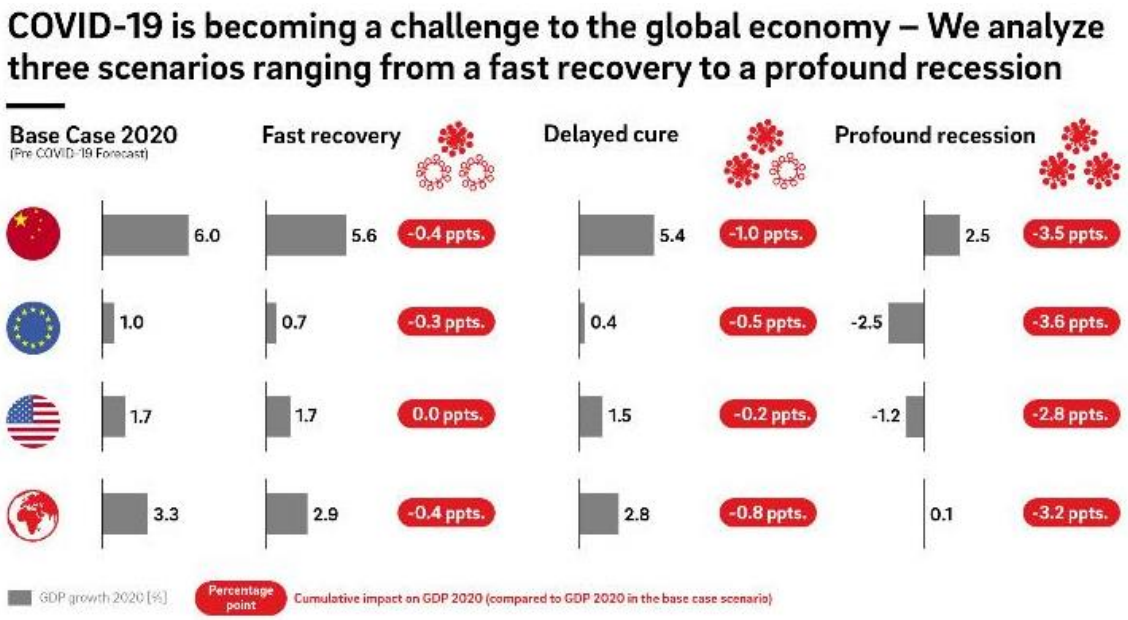


Figure 1.5 – Three scenarios ranging from a fast recovery to a profound recession [41]

Europe, as the world's biggest trading block, could be particularly hard hit by an extended corona outbreak. Our worst-case scenario foresees full containment not being achieved until 2021. The healthcare system will experience capacity shortages, and production in several industries will be disrupted. In the Delayed Cure scenario, supply chains from Asia to Europe, particularly important for pharmaceutical raw materials and electronics, will be in jeopardy and crucial supply chains within Europe will also start to break down. We will see a temporary decline in consumption and investments. In the optimistic Fast Recovery scenario, disruptions will only occur in specific sectors, the supply shock will be less strong, domestic production will only be impacted in Italy and demand will fall in just a few industries, such as travel and tourism.

With its strong focus on the domestic market and orientation towards services, the United States economy is not likely to be as badly affected as other regions. True, our worst-case scenario foresees a strong impact on NAFTA supply chains and a drop in consumption, with a resulting decline in GDP of 1.2 percent in 2020. But in our moderate scenario, supply chains are interrupted in selected industries only and fiscal and monetary stimulus are likely, given that this is an election year. In the best-case

scenario, we see no slowdown in GDP growth, with domestic demand stable and business largely continuing as usual.

The impact of COVID-19 on different business sectors varies due to the differences in supply and demand patterns. The automotive industry, already weakened by slow growth rates in 2019, is likely to experience the biggest downturn. Gross value added (GVA) could fall by as much as 10.6 percentage points in 2020 in the worst-case scenario compared to the base-case scenario without a COVID-19 impact, with vehicle sales down more than 10 percent on their forecast levels and no ramp-up possible due to supply chain problems (fig. 1.6).

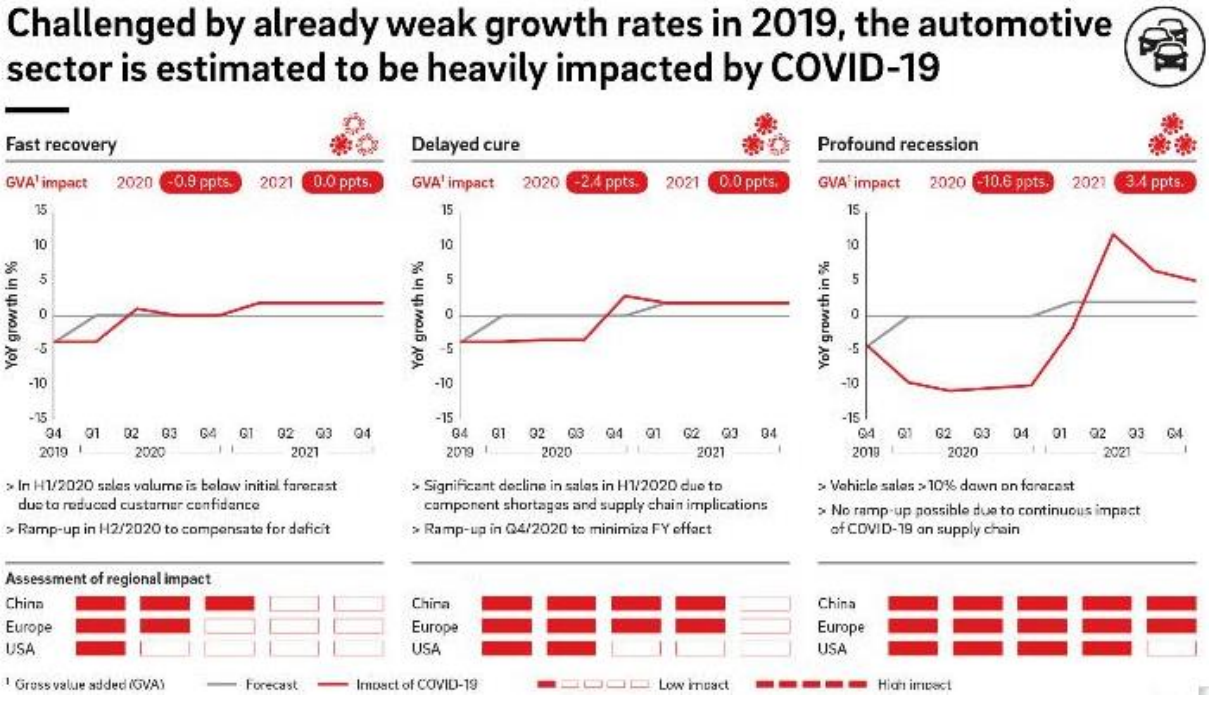


Figure 1.6 – Influence of Covid-19 to automotive sector [41]

Mechanical engineering will see both supply and demand shocks. In the moderate scenario, the supply shock will be exacerbated by falling demand. In the best-case scenario, the closure of Chinese factories only causes a minor shock, with lack of supply partly buffered by inventories (fig. 1.7).

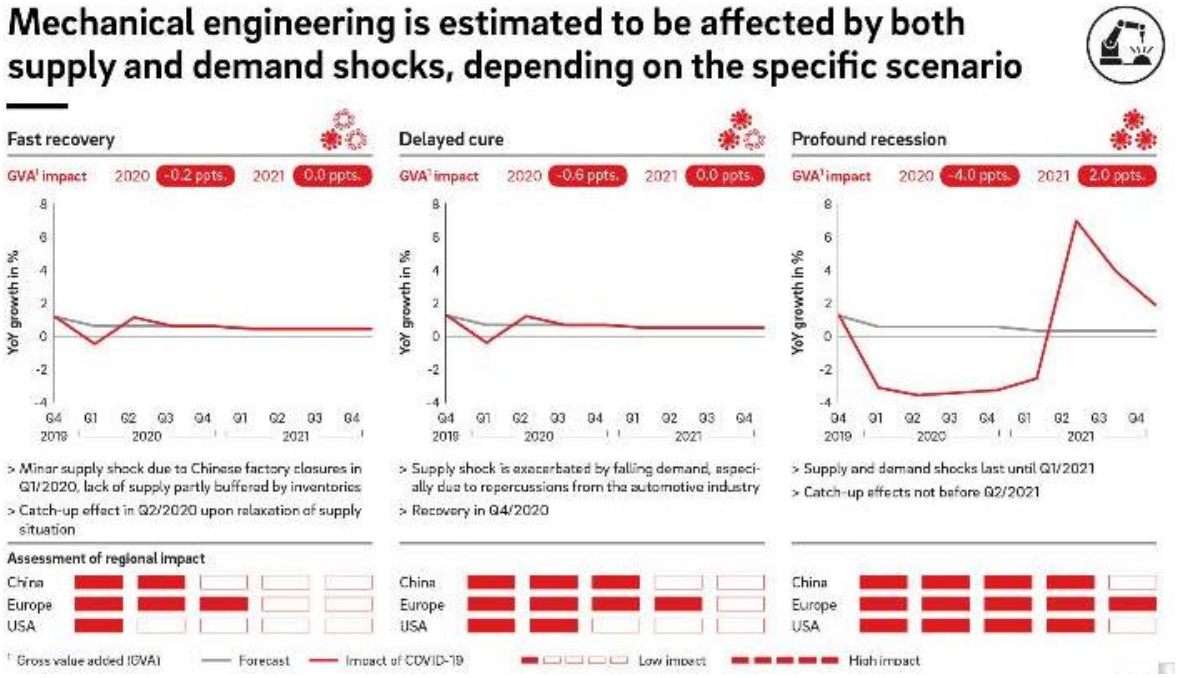


Figure 1.7 – Mechanical engineering and influence of Covid-19 [41]

The logistics industry reacts sharply to any weakening in trade flows, making the industry particularly vulnerable to COVID-19 (fig. 1.8). The worst-case Profound Recession scenario foresees a severe decline in demand. The moderate scenario predicts prolonged production downtimes, leading to a lasting decline in demand for logistics services. The industry will also face increased risk from further lockdowns in major regions. In the best-case scenario, the biggest impact is seen in China, due to quarantine measures and the isolation of entire provinces.

Finally, the pharmaceutical industry will see increased stress on supply chains, but steady demand should ensure further growth. At worst, growth rates will be low, in line with the weak global economy, as non-essential purchases are delayed. In the moderate scenario, growth will slow due to supply shocks but demand will be steady.

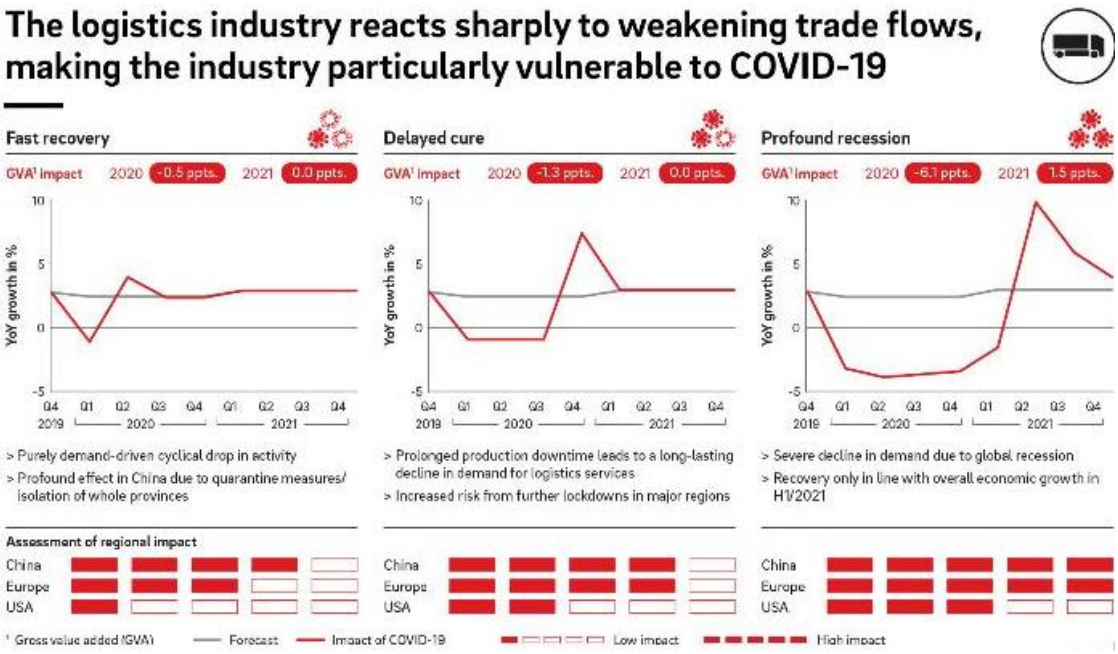


Figure 1.8 – Logistics industry and influence of Covid-19 [41]

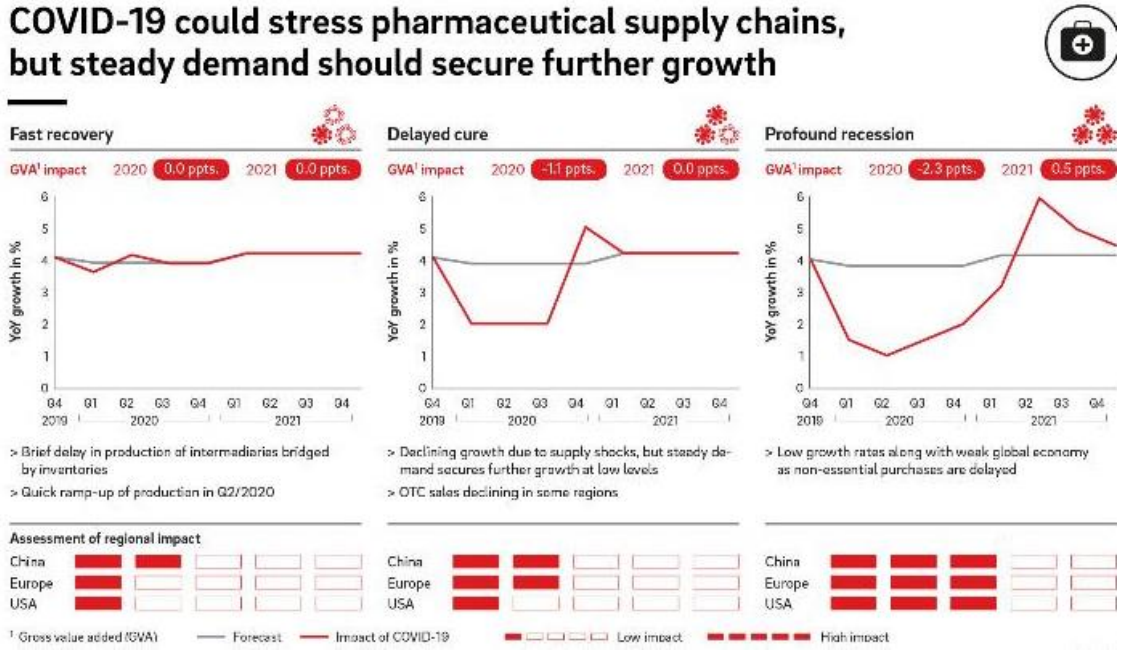


Figure 1.9 – Pharmaceutical industry and influenceof Covid-19 41]

Buyers and suppliers are expected to collaborate to address this overwhelming coronavirus impact on the freight and transportation industry. This is the need of the hour as their services are considered critical to cater to emergency requirements from healthcare/government agencies. Such initiatives will also assist them to generate

additional revenue streams which are currently rare in this economy that is reeling under the coronavirus impact.

1.4 Chapter 1 summary

The theoretical part of the thesis is devoted to the impact of the global pandemic on business development. Particular attention is paid to the further development of the logistics industry.

The basic measures and regulation during quarantine of the regions of the world were described.

The logistics industry reacts sharply to any weakening in trade flows, making the industry particularly vulnerable to COVID-19. Foresees a severe decline in demand. Its expected prolonged production downtimes, leading to a lasting decline in demand for logistics services. The industry will also face increased risk from further lockdowns in major regions.

Governments across countries have stepped in to revive the ailing enterprises in the freight and transportation industry as the demand curve has taken a nosedive owing to the coronavirus impact.

CHAPTER 2
THE EFFECTS OF COVID-19 PANDEMIC ON GLOBAL INDUSTRIES AND ITS CONSEQUENCES. ANALYSIS OF THE ACTIVITIES OF THE COMPANY "KYHW"

2.1 Analysis of the effect of coronovirus on the activities of transport enterprises

The COVID-19 pandemic has now spread across the entire globe. But we are also beginning to see some positive signs. With China recording hardly any new infections, many countries in Europe, as well as the United States, are now also seeing a decline or at least a stabilization in the number of new cases. Many countries are talking about relaxing the lockdown rules or have already begun to do so. That said, the pandemic is far from over. Despite the start of some clinical trials, it is doubtful that a vaccine will be available this year. The development of effective drugs for patients suffering from the virus is also likely to take months.

The scenario involving a four-week shutdown has now become unrealistic, so we are concentrating our analyses firstly on the scenario around a twelve-week shutdown of the economy. Our forecasts have been adjusted to reflect the latest developments. Secondly, we compare the current crisis with the most recent major economic upheaval, the global financial crash of 2008. In particular, we analyze how long various sectors of the economy are likely to take to recover from the current crisis and what specific situations state aid packages are having to mitigate today.

The recovery of the automotive industry after the current crisis will take longer than in the period after the global financial crisis in 2008.

A look around the world. It is already clear that the global economy will take a massive hit from the impact of the COVID-19 pandemic this year. Contrasting with the situation during the financial crisis, global GDP growth will not only stagnate but will

fall by more than two percent – after global growth of over three percent was forecast just a few months ago.

The economic slump will affect all regions and countries. China has already reported a 9.8% drop in GDP for the first quarter of 2020 compared to the previous quarter. Since the Chinese economy has now started up again but demand from abroad will be lacking for some time to come, we expect China's GDP to grow by just 2.5% in 2020. This is a decline of 3.5 percentage points compared to the forecast prior to the COVID-19 pandemic [33].

Europe and the United States will be hit even harder than China. In those countries, we expect the weeks of lockdown and the further measures to protect the health of the population to cause GDP to plummet by 5.2% (Europe) and 5.4% (USA) in 2020. Although we do expect the global economy to grow again in 2021, even in China, Europe and the United States, this growth will not be sufficient to offset the losses of 2020. In fig. 2.1 is presented the Covid-19 bigger impact on most industries than GFC (The Global Financial Crisis).

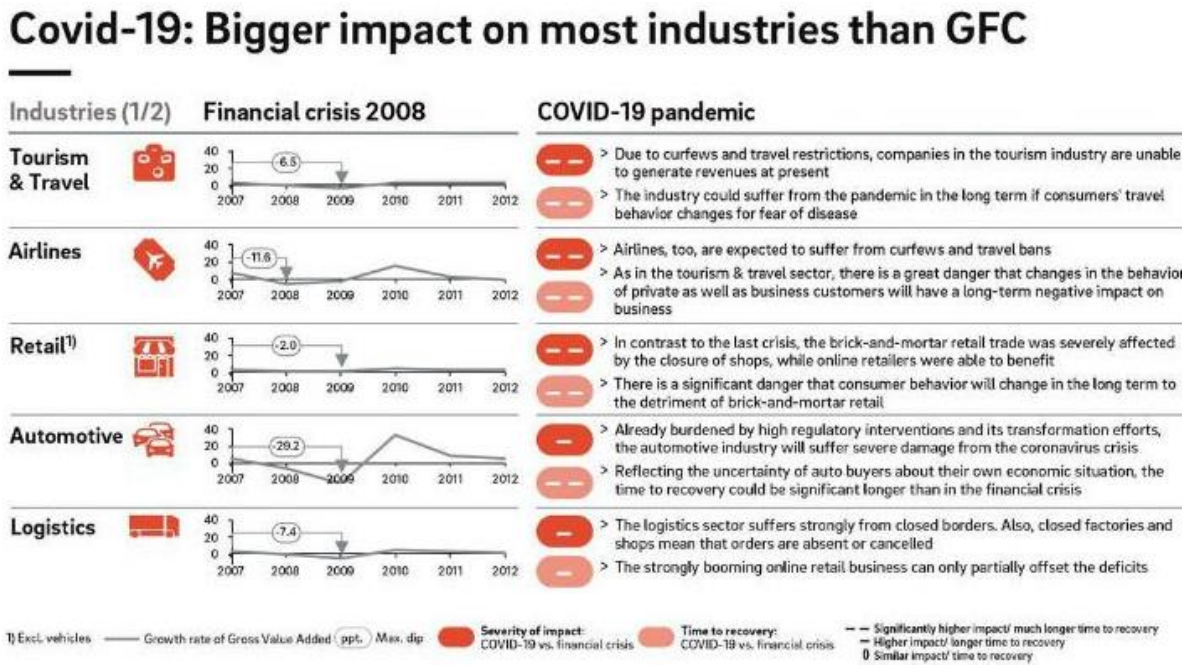


Figure 2.1 – Covid-19: bigger impact on most industries than GFC (The Global Financial Crisis) [41]

This crisis is different. In 2008, the crisis began with disruption to the US real estate and financial markets and only spread to financial and real economy in the rest of the world after a certain time delay. The COVID-19 pandemic is exerting a more radical and abrupt effect. It has put the real economy out of action immediately and completely – evaporating supply and demand simultaneously. Plant closures, initially in China, caused supply lines to dry up. Unemployment meant that workers lost their incomes while consumption declined and was further stifled by the fact that most shops were ordered to close.

The COVID-19 pandemic is hitting many industries harder than the 2008 financial crisis, and most industries will take longer to recover from the losses they sustain. Here we take a look at travel and tourism, the automotive industry, and the engineering sector as examples:

Travel has come to an almost complete standstill owing to border closures, quarantine regulations, and entry bans. Business and vacation travel has been rendered redundant, as it is neither possible to travel to nor to stay in most destinations around the world. What's so disastrous about this is that the industry will not be able to make up for these lost journeys, either. Video conferencing is currently replacing face-to-face business meetings. Workers are not able to postpone their annual leave – given the situation their employers are in – and are having to spend it at home instead. Any recovery for this sector is currently a distant dream.

The automotive industry is being pummeled by the COVID-19 pandemic at a time when it already has enough challenges to deal with in the form of digital transformation, electrification, and the development of self-driving vehicles. During the financial crisis, demand was stimulated by government measures such as car scrappage schemes. But there is doubt over whether this solution would help in the current crisis (fig. 2.2).

During the financial crash, mechanical and plant engineering suffered a drop in growth almost as severe as the automotive industry. As a result, while the engineering sector did recover, it remained persistently below pre-crisis levels, particularly in terms of profit margins. The current crisis is affecting the sector in a similar way to the

automotive industry as it navigates an already difficult phase. In addition to weak margins, many engineering companies are also suffering from underinvestment, especially when it comes to digitalization. In contrast to the automotive industry, however, the engineering sector's recovery is unlikely to take longer than it did after the financial crisis, especially as companies have the opportunity to secure their profits through services, such as maintenance contracts.

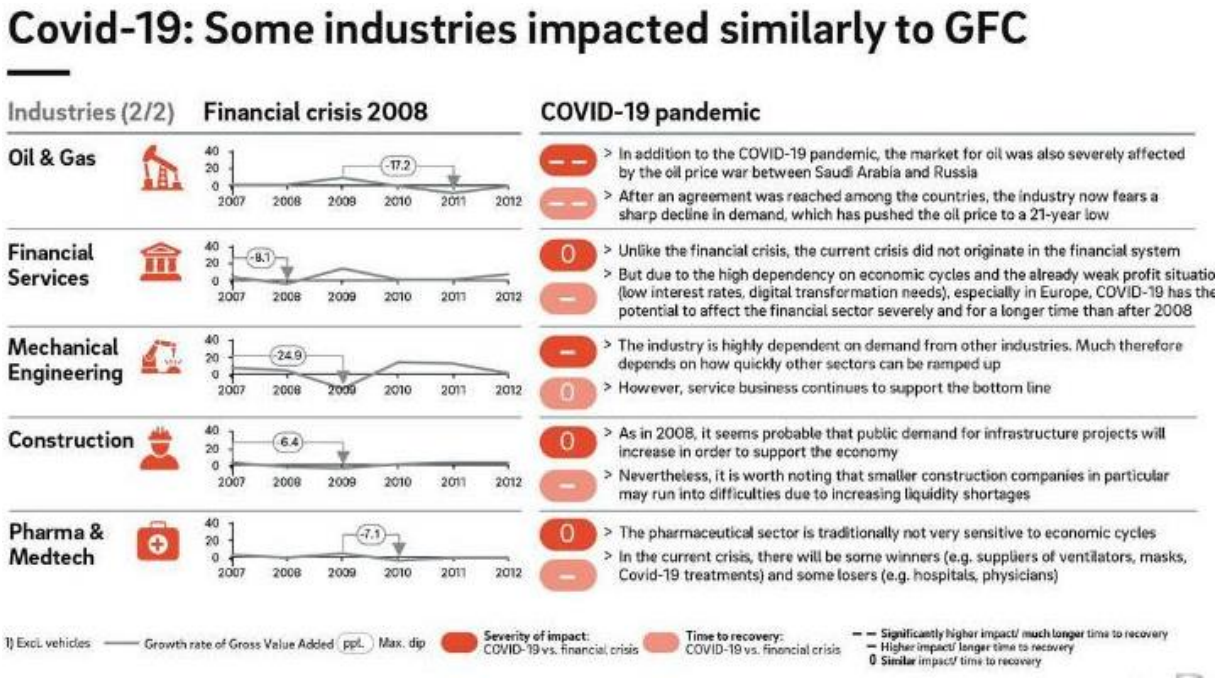


Figure 2.2 – Covid-19: Some industries impacted similarly to GFC (The Global Financial Crisis) [41]

Governments around the world have put together large-scale rescue packages to ensure the survival of their economies. Most of these packages are significantly larger than their equivalents in the 2008 financial crisis, and given the scale of the impact on the real economy as described above, it is right that governments have acted so comprehensively and with such speed.

However, it is also clear that government measures must be adapted to the specific conditions encountered in the current crisis. After all, governments must first and foremost protect the health of their populations. Health protection measures and actions to stimulate the economy must, therefore, be balanced. Merely copying the measures

that worked in the financial crisis back in 2008 will not do any good in 2020. The measures that are currently needed to contain the pandemic, even if its effect is mitigated, will remain in force until a vaccine has been found and widely rolled out. Until this is achieved, we will all be working and consuming differently than we did before the crisis. The new reality will be different than the pre-crisis reality. Any attempt to grit your teeth just long enough to return to pre-crisis mode will fail resoundingly as this new reality bites. Companies and industries must respond to the current challenges by finding new answers to new problems.

2.2 Analysis of the logistics market of Ukraine: trends, difficulties and opportunities

Logistics as an industry has great potential and prospects: by 2024, the volume of the global logistics market will amount to 236 billion dollars. At the same time, the expert considers all types of activities in the supply chain: logistics, customer service, inventory management, information flow and order processing, warehousing, material handling, packaging, maintenance. According to forecasts, by 2024, the global logistics market will grow annually with a CAGR of 7.5% in monetary terms and 6% in quantitative terms.

CAGR (Compound Annnual Growth Rate) - a term that means the average annual growth rate, taking into account the compounding percentage. That is, if it is said that the company's CAGR revenue will be 30% for 3 years, this means that each year the revenue will grow + 30% compared with the previous year.

Global logistics markets (billion dollars and tons) during 2015 – 2019 and forecast till 2024 are presented in fig. 2.3-2.4.

The fact that growth will be more active in monetary terms, suggests that the cost of logistics services will increase.

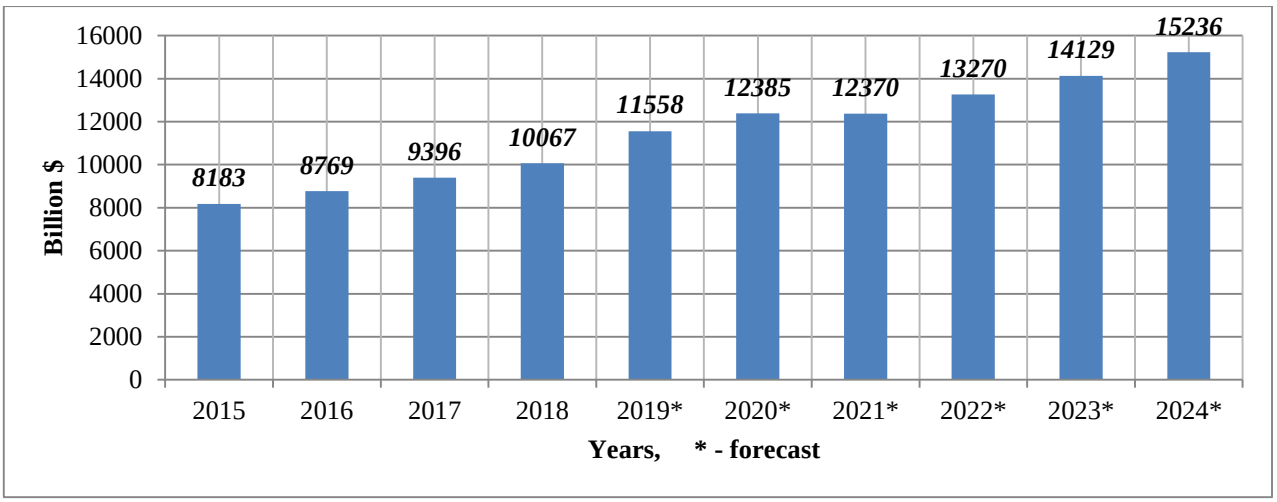


Figure 2.3 – Global logistics market, billion dollars during 2015 – 2018 and forecast till 2024

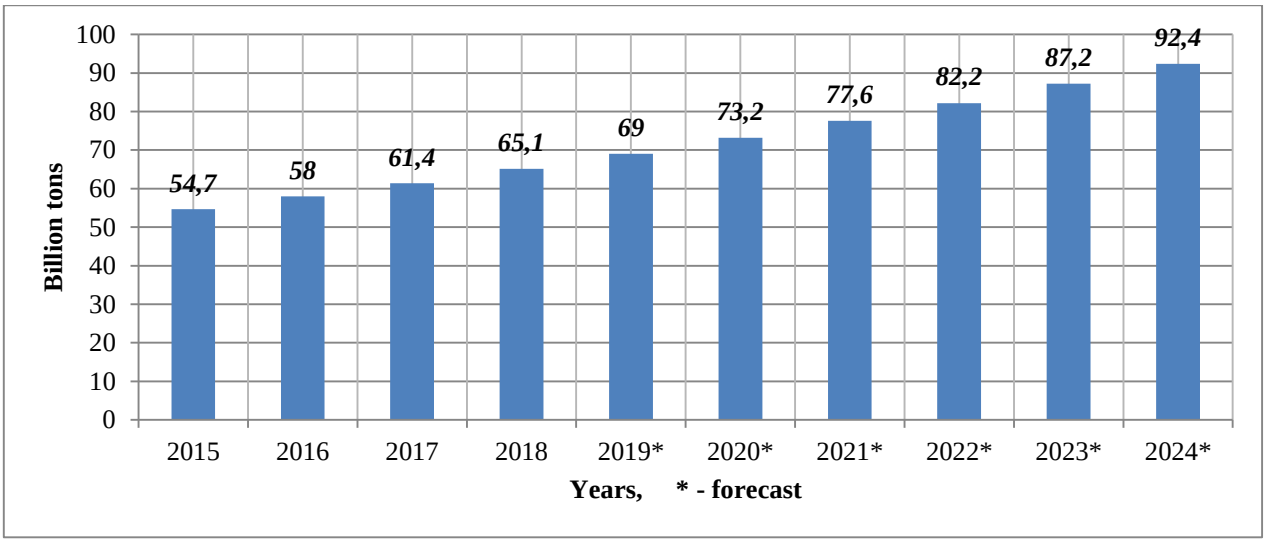


Figure 2.4 – Global logistics market, billion tons during 2015 – 2010 and forecast till 2024

The main driver for the qualitative development of the global logistics market is investment in technological innovations. We are talking about automated loading and unloading equipment, trailers, GPS, warehouse management software, various technologies that help companies more effectively manage the logistics services business. For example, in 2014, Deutsche Post DHL signed an agreement with the Escher Group, which helped DHL to modernize its network, initiating easier delivery and assembly in Germany.

Key players in the global market for logistics services are mainly American companies.

What is the place of Ukraine in this global market of logistics services? If we apply the calculation method and correlate the volume of traffic in quantitative terms in Ukraine with world indicators, we can conclude that our country's share in the global logistics market does not exceed one percent (fig. 2.5).

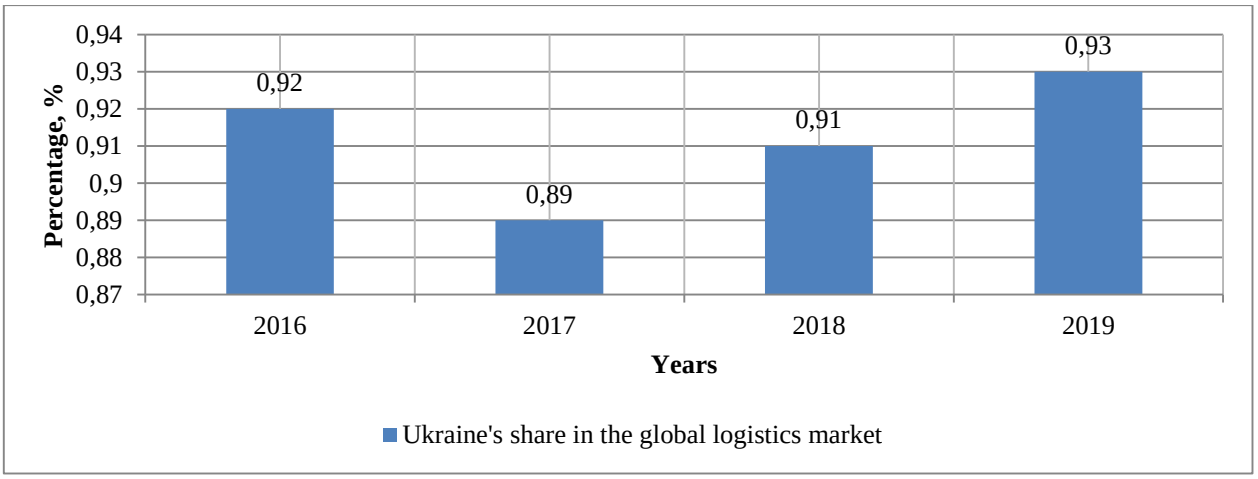


Figure 2.5 – Ukraine's share in the global logistics market

The Ukrainian logistics market includes several directions of cargo transportation: rail, water, automobile, and aviation. Despite the fact that most of the cargo is still sent by rail, the number of such shipments is constantly decreasing. At the same time, the share of automobile transportation is growing (fig. 2.6).

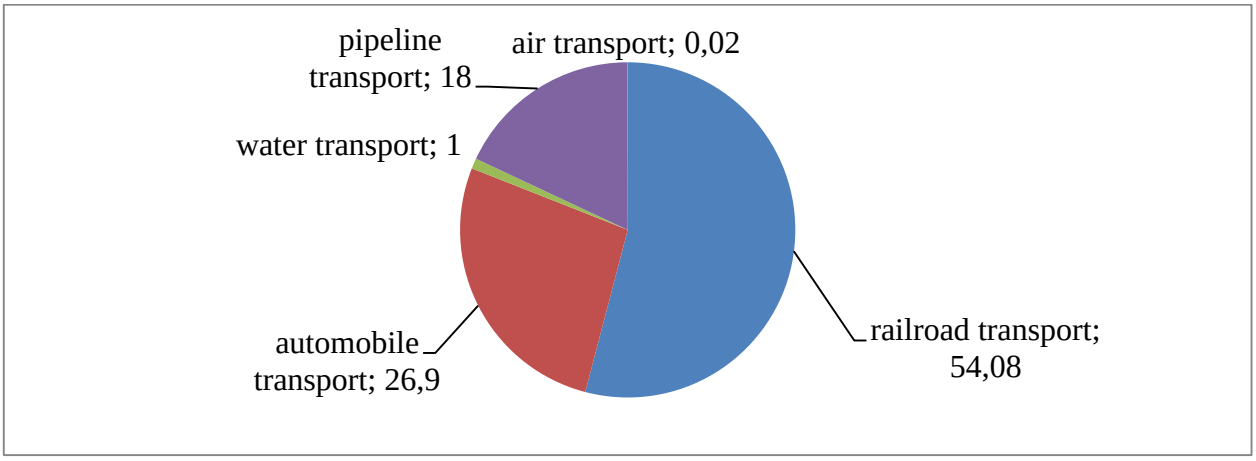


Figure 2.6 – Ukrainian logistics Market Structure by transportation in 2019

If you dwell in more detail on road haulage, there are a lot of companies here, and the level of competition is very high. One of the leaders is EUROPE-TRANS LTD. (In 2016, its turnover increased by more than 300%). Other companies also increased their performance. The main trends in the logistics market as a whole are the active development of the cargo segment up to 30 kg and the group cargo segment; the reduction of full-freight services, an increase among consumers of the share of manufacturers of furniture, light industry goods, and auto parts. You can also note the desire of some companies to expand their activities to other markets - by organizing their own insurance company, entering the market of international purchases, etc. In addition, among the trends should be mentioned the already mentioned decrease in the volume of traffic by rail and the growth in road transport.

The factors that affect the operation of logistics companies and the cost of their services are the poor condition of the roads (and, consequently, the high cost of transport depreciation), the long terms of payment for services, the high level of competition, the poor solvency of transport customers, the constant increase in fuel prices. lubricants and spare parts, increasing insurance rates.

In turn, the drivers of market growth are the development of e-commerce and population migration (domestic, international) - its level has risen significantly, which has led to an increase in the mailing segment.

In general, the market development forecast is positive. It is based on the balance of supply and demand: there is a high demand for logistics services in the e-commerce segment; The number of consumers such as online stores, manufacturers of light and processing industries is growing. In addition, the share of companies requiring outsourcing of transport and logistics services is increasing.

The most promising are auto and air transportation (international trend); rail transportation will also be able to return to growth - in case of stabilization and development of industrial production in the country. In turn, water transport will significantly increase the potential for development if new rules of the game are adopted (bill, infrastructure development, etc.). The expert considers investment in the strengthening of competitive advantages and new technologies the best areas for

investment in logistics; to expand the range of services provided (warehousing, distribution centers); to increase the concentration of the company's share in the market, including through mergers and acquisitions (the most likely such option can be considered in the segment of postal logistics).

2.3 General characteristics of KYHW Ltd

KYHW company works in the market of oil and chemical products for over 7 years. The main activity of the company is the sale of products for the food industry, the chemical industry, the sale of fuel materials, as well as the production of wooden containers.

The main activities of the enterprise are presented in fig. 2.7.

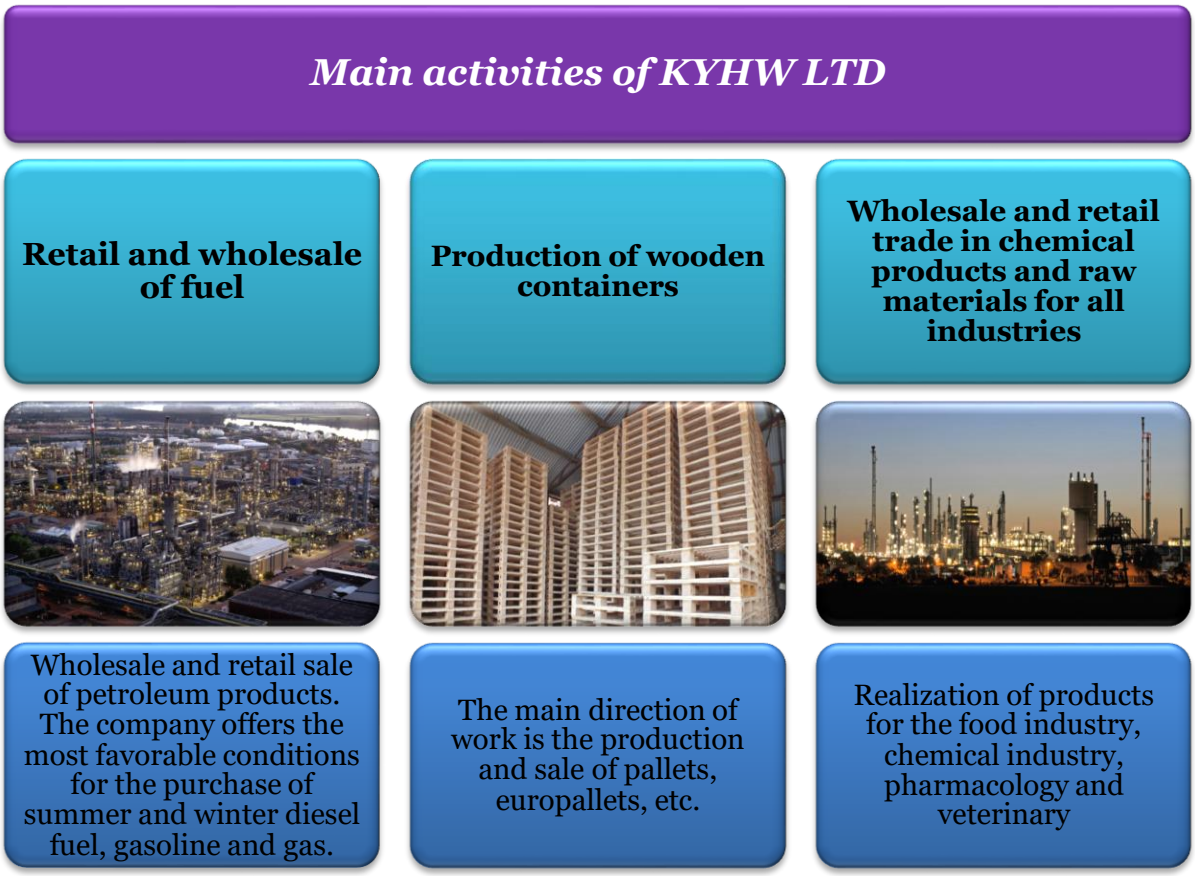


Figure 2.7 – Main activities of “KYHW” Ltd

The company cooperates with manufacturers without intermediaries, and this makes it possible to establish competitive prices. Today “KYHW” Ltd can offer the widest assortment of products of extremely high quality from proven manufacturers.

Then, in more detail, consider the types of activities of “KYHW” Ltd in terms of logistics. “KYHW” Ltd is engaged in wholesale and retail sale of petroleum products, offering the most favorable conditions for the purchase of summer and winter diesel fuel, gasoline and gas. The main direction of work is the production and sale of pallets, europallets.

The company works in order to perform its work with high quality and inspiration so that clients, society, business partners, employees, receive a positive charge in any situation and perceive “KYHW” Ltd as a reliable partner.

Main advantages of “KYHW” Ltd:

- there is always an own special equipment for the transportation and delivery of pallets;
- discount for regular customers;
- free loading and unloading works;
- affordable prices for pallets;
- possibility to order non-standard products.

As already mentioned earlier, “KYHW” Ltd also offers chemical products and raw materials: industrial chemistry; solvents; nutritional supplements; feed additives; vitamins and vitamin-like substances; amino acids; pharmaceutical substances; fertilizers; polymer products.

The classification of chemical products according to the types proposed by “KYHW” Ltd are presented in fig. 2.8. The company cooperates with manufacturers directly, without intermediaries, which enables them to set reasonable prices. “KYHW” Ltd is one of the largest suppliers of chemical products. The widest assortment of the offered products allows you to choose the necessary goods in the minimal time. The enterprise has a high level of service, a service that includes specialized delivery terms.

For “KYHW” Ltd, the sale of chemical products is a scheme developed for small details that allows delivery in a timely manner by any available type of transport.

Figure 2.8 – The main types of chemical products of “KYHW” Ltd

In its activities, “KYHW” Ltd strives to remain a dynamically developing company, well-managed and occupy a leading position in the market of oil, chemical and woodworking products in Ukraine, Europe and the CIS countries.

“KYHW” Ltd adheres to the principles of fair and mutually beneficial partnership with consumers and suppliers. Our customers are guaranteed timely delivery of products. The company is working with high-quality raw materials. The needs of our customers in chemical raw materials and other products are satisfied as quickly as possible, always in full, in strictly defined terms and at reasonable prices.

Next, it is necessary to analyze the organizational structure of “KYHW” Ltd, which is present in fig. 2.9.

Thus, according to the statute of “KYHW” Ltd, the chief executive is the general director, who is directly subordinated to the deputy director, department heads, chief accountant, chief marketer, chief economist, and also the system administrator.

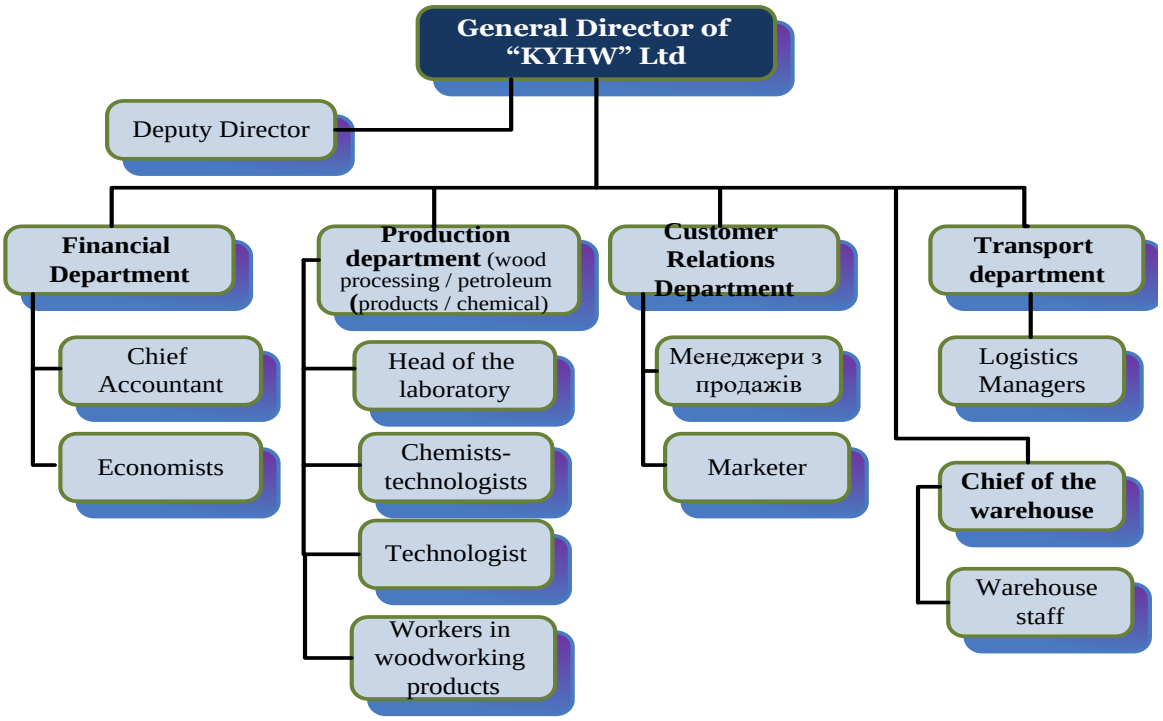


Figure 2.9 – Organizational structure of "KYHW" Ltd

The company "KYHW" Ltd has its own warehouse, located at the address. Gostomel Kiev region, st. Lenin 141 B, area 800 m^2. The warehouse is equipped with: electric cars; elevator for lifting goods to the second floor of the warehouse; ramp for acceptance of goods; rokla; tiered shelving and the like. The main purpose of this composition is the concentration of stocks, their storage and ensuring uninterrupted and rhythmic supply of orders.

The main is the production department, which is divided into: chemical products, petroleum products and woodworking. It is clear that for such specific products highly qualified specialists are needed, such as: chemical technologists, technologists, laboratory technicians and woodworking workers. The transport department is working on the delivery of the order to its destination on time. Cars are allowed for international carriage in compliance with the provisions of the International Convention on Road Traffic and the European Agreement. Stock of cars of "KYHW" Ltd is presented in the table. 2.1.

"KYHW" Ltd has a specialized rolling stock: 10 truck with semi-trailers. The enterprise maintains and repairs its own transport. Not always the company can meet

the demand for transportation. So, in table 2.2 and fig. 2.10 presented the number of completed orders by year and the percentage that falls on its own transport.

Table 2.1 - Stock of trucks of “KYHW” Ltd

№	Name	Model	Toxicity standard	Fuel consumption by 100 km, l.	Freight, t.	Number of trucks
1	2	3	4	5	6	7
1	TGA 26.480 6X2 XXL	MAN	Euro 4	27	20	3
2	TGX 18.440	MAN	Euro 4	24	25	2
3	1844 LS ACTROS	MERCEDES -BENZ	Euro 3	19,3	22	1
4	ACTROS 1846	MERCEDES -BENZ	Euro 4	23	20	1
5	Actros 2650 LS	MERCEDES -BENZ	Euro 3	21,5	25	1
6	XF 430	DAF	Euro 3	30	25	1
7	XF 95 480	DAF	Euro 3	27	20	1

The main customers of “KYHW” Ltd for the international carriage of goods are the following companies: LLC "ECO-AVTOTEKHNIKS" (distribution company of spare parts for cars), DOEHLER UKRAINE (company for the manufacture and sale of soft drinks), LLC TD Mercury (grocery stores and gastronomy), RUUKKI UKRAINE (roofing and building materials).

Table 2.2 – The number of completed orders for own transport and hired

Total orders	2017		2018		20189	
	The number of orders	Share of traffic	The number of orders	The number of orders	The number of orders	The number of orders
	192		264		312	
The maximum number of orders served by own transport	144	75	144	55	144	46
Number of orders served by hired transport (other carriers)	48	25	120	45	168	54

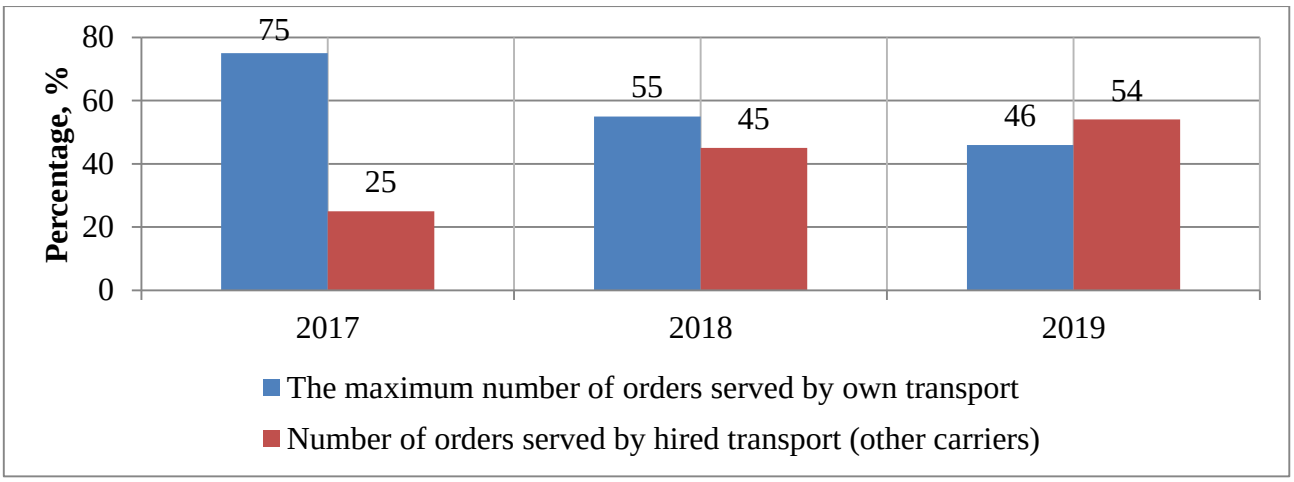


Figure 2.10 – Dynamics of the share of orders served by own and hired transport

Next, we will analyze the logistics system of "KYHW" Ltd. However, first we will define the logistics system, which is an organizational and economic mechanism for managing material and information flows. It includes materials that provide the movement of goods along the logistics chain (warehouses, loading and unloading mechanisms, vehicles), production stocks and means of control of all links in the chain. The logistic system is an adaptive feedback system that can be represented in fig. 2.11.

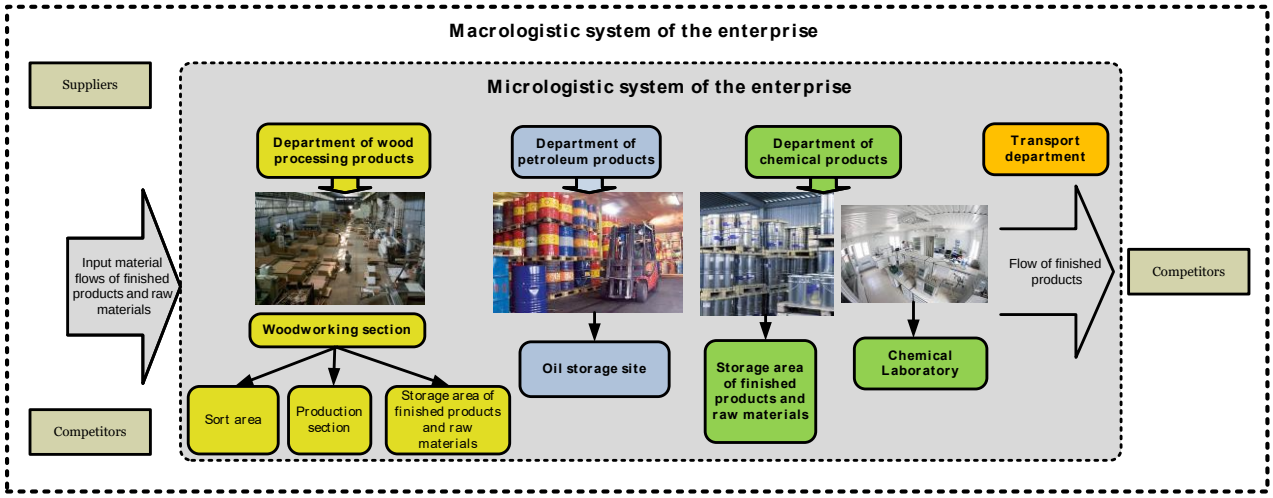


Figure 2.11 – Scheme of the logistic system of "KYHW" Ltd

The set of production processes taking place at "KYHW" Ltd. is a combined production process. However, it should be noted that production processes form the production structure of the enterprise, which can be seen in fig. 2.11. The process of carrying out each individual type of enterprise products is called a private production

process. In turn, in a private production process, partial production processes can be identified as complete technological elements of the private production process, which is not the primary element of the production process (it is usually carried out by workers of various specialties using equipment of different purposes).

Organization of the production process is to unite people, tools, objects of labor into a single process of material goods, as well as to ensure a rational combination of space and time of the main, auxiliary and service processes.

The manufacturing processes at the enterprises, according to the business process approach, are detailed in terms of content (process, stage, operation, and element) and place of implementation (enterprise, shop, branch, and site).

The micro-logistic system consists of the production and organizational structures of the “KYHW” Ltd. The enterprise has its own production capacity. However, in recent times, the transport process has to be provided by outside enterprises. “KYHW” Ltd uses the services of expeditionary companies and private carriers.

2.4 Analysis of the main production and financial indicators of “KYHW” Ltd

For “KYHW” Ltd, the main production indicators are the volume of products sold by types of products in the company's services. So, on fig. 2.12 presented the share of the main types of services of “KYHW” Ltd.

Thus, it can be seen that the growth of sales in ths. Uah annually increases. However, the correct policy of “KYHW” Ltd plant in expanding the range of products and offers for integrated customer service has increased the company's profitability, as shown in fig. 2.13.

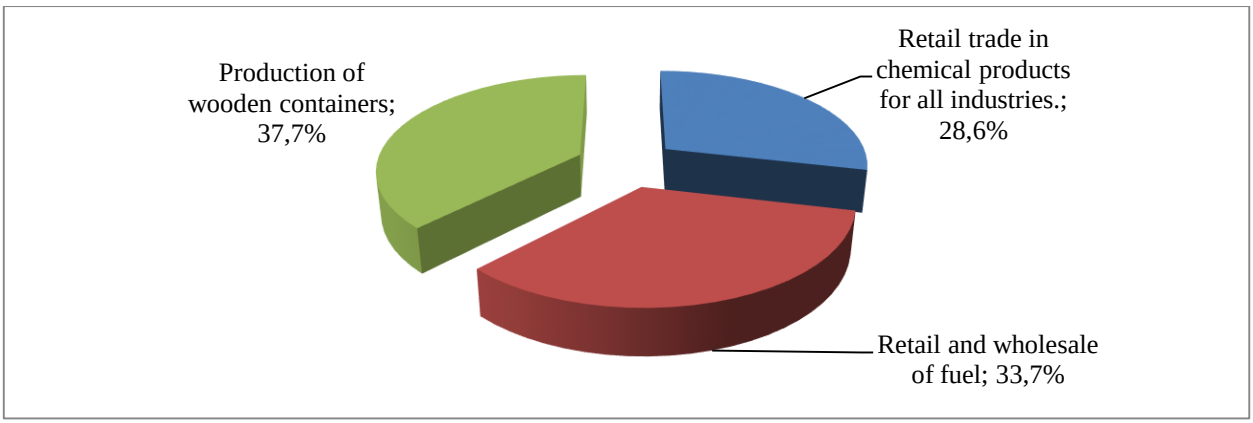


Figure 2.12 – The share of the main types of services provided by “KYHW” Ltd by sales volume in 2019

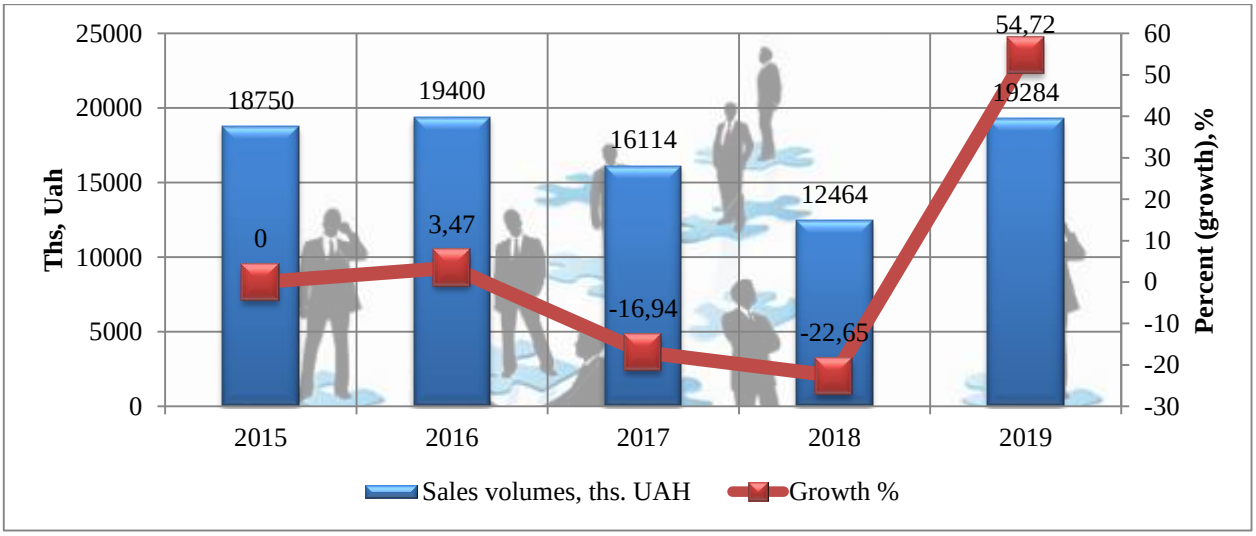


Figure 2.13 – Volumes of products sales of “KYHW” Ltd in ths. Uah and growth in 2015-2019

A general analysis of the volume of sales in monetary terms for 2015-2019 will be presented in table 2.3 and in fig. 2.13.

Table 1.3 – Volume of sold products in ths. Uah for 2015-2019

№	Years	Volume of sold, ths Uah	Growth, %
1	2	3	4
1	2015	18750	0
2	2016	19400	3,47
3	2017	21114	8,84
4	2018	21964	4,03
5	2019	23284	6,01

Next, we will analyze the sales of volumes of “KYHW” Ltd according to the main types of activities, the results of which are presented in the table 2.4.

Table 2.4 – Sales of volumes of “KYHW” Ltd by type of services

Years	Retail and wholesale of fuel		Manufacturing of wooden containers and biofuels		Retail trade in chemical products for all industries	
	Ths Uah	Percentage, %	Ths Uah	percentage, %	Ths Uah	percentage, %
2015	0	0	15562,5	83	3187,5	17
2016	3395	17,5	12610	65	3395	17,5
2017	4497,282	21,3	12035	57	4581,74	21,7
2018	6040,1	27,5	9444,52	43	6479,38	29,5
2019	7846,708	33,7	8778,07	37,7	6659,22	28,6

Dynamics of sales of goods by the share of types of services is presented in Fig. 2.14. As can be seen from the data, in 2014, the main share of sales was made in the manufacture of wooden packaging and accounted for 83%. The insignificant share was made by trade and retail of chemical products for all industries. So, in the figure we can see how the share of services provided varies over the years.

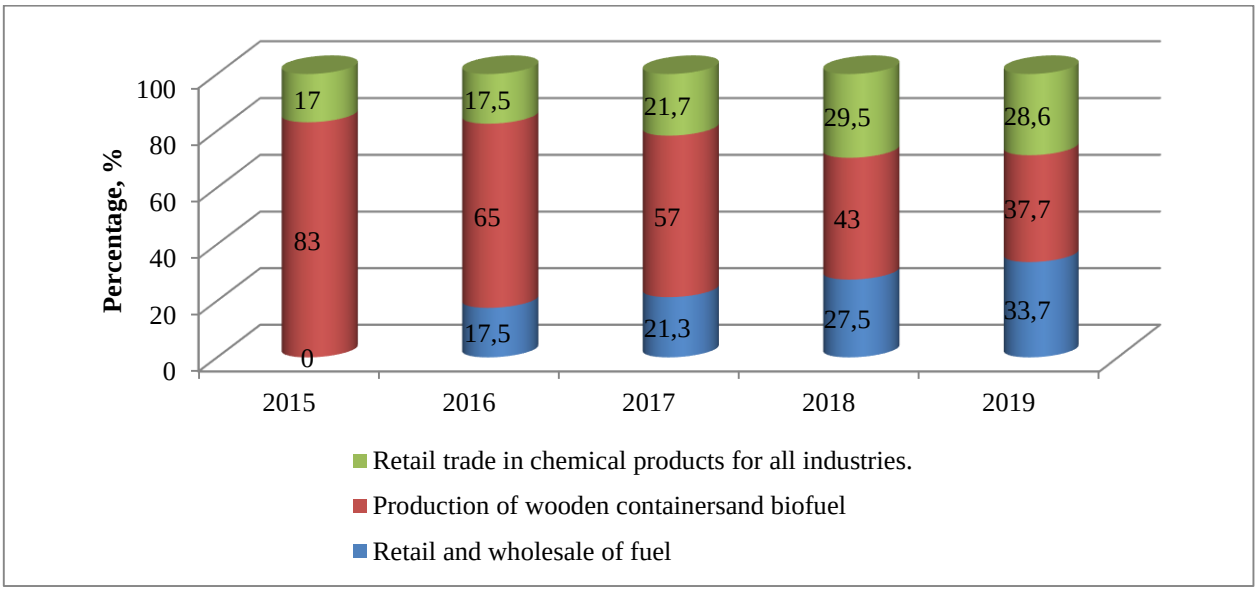


Figure 2.15 –. Dynamics of sales of goods by share of services during the period 2015-2019

Thus, today the share of sold services of “KYHW” Ltd is almost the same, only by 10% on average less than the retail trade in chemical products compared to the

manufacture of wooden containers (which was 37.7% in 2019) and retail and wholesale fuel and its products (respectively, is 33.7%).

Also its necessary to analyze the assess of financial condition of “KYHW” Ltd. The main purpose of the analysis of business activity of “KYHW” Ltd is to assess the effectiveness of asset management and determine the potential for its increase. The degree of business activity of an enterprise is determined using turnover ratios. In table 2.5 will present the turnover ratios of “KYHW” Ltd in 2017 – 2019.

Table 2.5 – Turnover ratios of “KYHW” Ltd for 2017-2019

№	indicators	years			Growth rate, %	
		2017	2018	2019	2018/2017	2019/2018
1	2	3	4	5	6	7
1	Current assets turnover ratio	1,91	2,29	2,25	119,9	98,25
2	Resource efficiency ratio	-0,05	-0,005	0,007	1000	140
3	Inventory turnover ratio	8,79	8,74	8,64	99,43	98,86
4	The turnover ratio of receivables	2,62	3,3	3,28	125,95	99,39
5	Payables turnover ratio	5	5,09	5,47	101,8	107,47
6	Duration of turnover of receivables, days	137	109	110	79,56	100,92
7	Duration of inventory turnover, days	41	42	42	100,02	100
8	Duration of accounts payable turnover, days	72	71	66	98,61	92,96

The resource efficiency ratio is extremely unsatisfactory, the reason for this is a loss in 2017 and 2018 and a small income (relative to assets) in 2019.

The duration of the turnover of accounts receivable decreased with each passing year, which is a good change. The shortest duration was in 2018 and amounted to 109 days, that is, for the year the receivables turned out 3.3 times. We will analyze the dynamics of the main indicators of the use of current assets of “KYHW” Ltd (table 2.6).

Thus, summing up the dynamics of the main indicators of the use of current assets, it is worth noting that sales revenue for the periods under review grew and ensured a

growth rate of 13.4% in 2018 and 112.73% in 2019. This trend of this indicator is quite a positive phenomenon for the enterprise. Also, an increase in the amount of revenue from sales indicates a more efficient sales and production activity.

Note, the sum of the average annual balances of current assets contains the cost of inventories, finished products, receivables and cash, available in “KYHW” Ltd for in the reporting year. An increase of this indicator by 11.78% in 2018 and by 14.89% in 2019 indicates an increase in the scale of the enterprise itself and its individual elements.

Table 2.6 – Analysis of the dynamics of the main indicators of the use of current assets and the impact of factors on the economic result of accelerating the turnover

№	Indicator	2017	2018	Deviation (+,–)	Growth rate, %	2019 year	Deviation (+,–)	Growth rate, %
1	2	3	4	5	6	7	8	9
1	1. Income (revenue) from sales, ths. Uah	5101615	6836256	1734641	134,00	7706765	870509	112,73
2	2. Average annual balances of current assets, ths. Uah	2666133	2980162	314029	111,78	3423773	443611	114,89

With regard to the acceleration and deceleration of turnover, it should be noted that the change in the duration of the turnover of current assets in the direction of increase was influenced by current assets. Thus, the impact is determined at the level of 25 days in 2015 and 26 days in 2016 Realizing that the duration of turnover is recommended to be reduced, it is possible to state a negative impact.

Analyzing the amount of release and attraction of funds from the turnover of “KYHW” Ltd, we note that the release of funds in 2018 compared to the previous period amounted to Uah 612,675. The change was due to a decrease in the amount of revenue from sales.

The general financial indicator of the activity of any enterprise is its profit. The dynamics of operations for the formation and distribution of profit will be presented in the table 2.7.

Table 2.7 – Financial results of “KYHW” Ltd in 2017-2019

№	Indicator	2017	2018	2019	Absolute deviation (2018–2017)	Absolute deviation (2019–2018)
1	2	3	4	5	6	7
1	Revenue (revenue) from total sales	5101615	6836256	7706765	1734641	870509
2	Taxes and product pricing fees	415061	534437	652944	119376	118507
3	Net income (revenue) from sales	4686554	6301819	7053821	1615265	752002
4	Cost of sales	4202262	5459039	6113041	1256777	654002
5	Gross profit	484292	842780	940780	358488	98000
6	Other operating income	1306352	1884597	2595964	578245	711367
7	Total operating income	5992906	8186416	9649785	2193510	1463369
8	Administrative expenses	282502	276455	303264	-6047	26809
9	Sales Costs	311748	425385	452530	113637	27145
10	other operating costs	1288538	1891401	2522962	602863	631561
11	General operating expenses	6085050	8052280	9391797	1967230	1339517
12	Operating profit	-92144	134136	257988	226280	123852
13	Income from investments and financial activities	7789	25388	8461	17599	-16927
14	Expenses from investment and financial activities	120360	141956	158728	21596	16772
15	Profit from ordinary activities before taxation	-204715	17568	107721	222283	90153
16	Income taxes	66084	72838	62054	6754	-10784
17	Profit from ordinary activities	-270799	-55270	45667	215529	100937
18	Net profit	-259139	-26551	45934	232588	72485

From table 2.7 it is clear that the activities of “KYHW” Ltd in 2017 and 2018 were unprofitable, and only in 2019 the company made a profit.

As a result of the study of the financial performance of the enterprise, it is also expedient to analyze its operating expenses, which include many components (table 2.8) and form the cost price of the products produced.

Table 2.8 – Operating costs of “KYHW” Ltd for 2017-2019

№	Operating costs	2017	2018	2019	Absolute deviation (2018–2017)	Absolute deviation (2019–2018)
1	2	3	4	5	6	7
1	Material costs	3726294	4928210	4368822	1201916	-559388
2	Labor costs	199981	255155	338966	55174	83811
3	Deductions for social events	76897	93668	161945	16771	68277
4	amortization	415901	357668	354686	-58233	-2982
5	Other operating costs	433797	568651	1414468	134854	845817
6	Total	4852870	6203352	6638887	1350482	435535

As a result of the comprehensive financial analysis of “KYHW” Ltd, we draw the following conclusions. Thus, it was found that the activities of “KYHW” Ltd in 2017 and 2018 were unprofitable, and only in 2019 there was a profit. So, summing up the above financial analysis, we can say that the overall financial status of “KYHW” Ltd is satisfactory.

In the analytical part of the thesis work was analyzed company “KYHW” in the market of oil and chemical products for over 7 years. The main activity of the company is the sale of products for the food industry, the chemical industry, the sale of fuel materials, as well as the production of wooden containers. The company cooperates with manufacturers without intermediaries, and this makes it possible to establish competitive prices. Today “KYHW” Ltd can offer the widest assortment of products of extremely high quality from proven manufacturers.

“KYHW” Ltd is engaged in wholesale and retail sale of petroleum products, offering the most favorable conditions for the purchase of summer and winter diesel fuel, gasoline and gas. The main direction of work is the production and sale of pallets, europallets.

The company works in order to perform its work with high quality and inspiration so that clients, society, business partners, employees, receive a positive charge in any situation and perceive “KYHW” Ltd as a reliable partner.

For “KYHW” Ltd, the main production indicators are the volume of products sold by types of products in the company's services. The growth of sales in ths. Uah annually

increases. However, the correct policy of “KYHW” Ltd plant in expanding the range of products and offers for integrated customer service has increased the company's profitability. Today the share of sold services of “KYHW” Ltd is almost the same, only by 10% on average less than the retail trade in chemical products compared to the manufacture of wooden containers (which was 37.7% in 2019) and retail and wholesale fuel and its products (respectively, is 33.7%).

Thus, summing up the dynamics of the main indicators of the use of current assets, it is worth noting that sales revenue for the periods under review grew and ensured a growth rate of 13.4% in 2017 and 112.73% in 2019. This trend of this indicator is quite a positive phenomenon for the enterprise. Also, an increase in the amount of revenue from sales indicates a more efficient sales and production activity.

2.5 Chapter 2 summary

The second part of diploma thesis is devoted to influence of the COVID-19 pandemic to entire globe economy. The Analysis of the logistics market of Ukraine: trends, difficulties and opportunities were considered.

Also it was analyzed the activity of the “KYHW”Ltd in the market of oil and chemical products for over 7 years. The main activity of the company is the sale of products for the food industry, the chemical industry, the sale of fuel materials, as well as the production of wooden containers. The company cooperates with manufacturers without intermediaries, and this makes it possible to establish competitive prices. Today “KYHW” Ltd can offer the widest assortment of products of extremely high quality from proven manufacturers.

“KYHW” Ltd is engaged in wholesale and retail sale of petroleum products, offering the most favorable conditions for the purchase of summer and winter diesel fuel, gasoline and gas. The main direction of work is the production and sale of pallets, europallets.

The company works in order to perform its work with high quality and inspiration so that clients, society, business partners, employees, receive a positive charge in any situation and perceive “KYHW” Ltd as a reliable partner.

For “KYHW” Ltd, the main production indicators are the volume of products sold by types of products in the company's services. The growth of sales in ths. Uah annually increases. However, the correct policy of “KYHW” Ltd plant in expanding the range of products and offers for integrated customer service has increased the company's profitability. Today the share of sold services of “KYHW” Ltd is almost the same, only by 10% on average less than the retail trade in chemical products compared to the manufacture of wooden containers (which was 37.7% in 2019) and retail and wholesale fuel and its products (respectively, is 33.7%).

Thus, summing up the dynamics of the main indicators of the use of current assets, it is worth noting that sales revenue for the periods under review grew and ensured a growth rate of 13.4% in 2017 and 112.73% in 2019. This trend of this indicator is quite a positive phenomenon for the enterprise. Also, an increase in the amount of revenue from sales indicates a more efficient sales and production activity.

CHAPTER 3
PROJECT RECOMMENDATION OF THE ORGANIZATION OF GOODS DELIVERY IN QUARANTINE CONDITIONS FOR “KYHW” LTD

3.1 Shipping restrictions due to COVID-19 in international automobile transportation

Global economy is in a state of paralysis as the novel coronavirus impact has forced countries to take extreme measures for the safe being of citizens. The pandemic has exposed the global value chains irrespective of industry even as companies continue testing the resilience of their operations.

A direct and substantial coronavirus impact on the Freight and Transportation industry is evident which is punctuated with dampened demand from key buyer industries such as the manufacturing and e-commerce. This position paper highlights the novel coronavirus impact on the Freight and Transportation industry and the consequent demand-supply situation.

Today, logistics, like other business areas, is experiencing turbulence as a result of the spread of Covid-19 in the world and in Ukraine. Consider the experience in the spread of coronavirus and forecasts regarding the development of the situation in the short and long term in the context of automobile transportation.

The introduction of quarantine led to the closure of most enterprises and factories in Ukraine and Europe. This, in turn, affected the volume of international road transport. Back in March, there was a demand for transport, and rates were rising, and already in April, demand began to fall. Thus, the decline in the automotive industry is about 20% (according to a pessimistic forecast). At the same time, a situation of gradual restoration of work is now observed.

Logistics, nevertheless, is perhaps in a better situation than hotel business or recreation. Although, of course, restrictions have affected logistics. As early as March

17, 107 borders were closed, and from April 7, the list was updated and only 19 were left open. At the same time, the business continued to work in such conditions.

At the beginning of the epidemic, tariffs gradually began to rise, but just as gradually, due to uneven demand, they showed a decrease. At the same time, we at the European Business Association once again emphasize that tariff setting should be competitive, because in a crisis, tariff increases can be deadly for some industries.

Road transport was the least sensitive to quarantine restrictions.

Today, in order to stay afloat, many logistics providers have to change their current work patterns and use alternative - often more costly options and algorithms. An interesting alternative in the new conditions can be multimodal (mixed) transportation. So, we are talking about the transportation of goods by two or more modes of transport, which is organized under the responsibility of the multimodal transport operator on the basis of a single agreement. For air cargo, a new option may be delivery through European hubs, for example, Frankfurt.

The distinct sub-segments of Freight & Transportation ecosystem will go through critical changes and disruptions in the short-term. Fig. 3.1 presents a quick dashboard that summarizes the impact on the industry so far and what to expect in the next 2-3 months.

1. Risk Mitigation Activities to Address the Coronavirus Impact on the Freight and Transportation Industry.

Uncertainties loom large and will swing between extremes as the coronavirus impact makes its presence felt in the global economy. Executives across the world are examining their supply chains with a microscope to find risk elements. Companies that can proactively identify or anticipate the bottlenecks in their supply chains will be closer to finding solutions for supply chain risk mitigation. Note that these solutions will have to be extremely customized for the sector, location and government responses and it is impossible to develop a ‘one-size fits all solution’. Still, there are elements which are common for any resilient risk mitigation plan. We recommend a few of those below for immediate results.

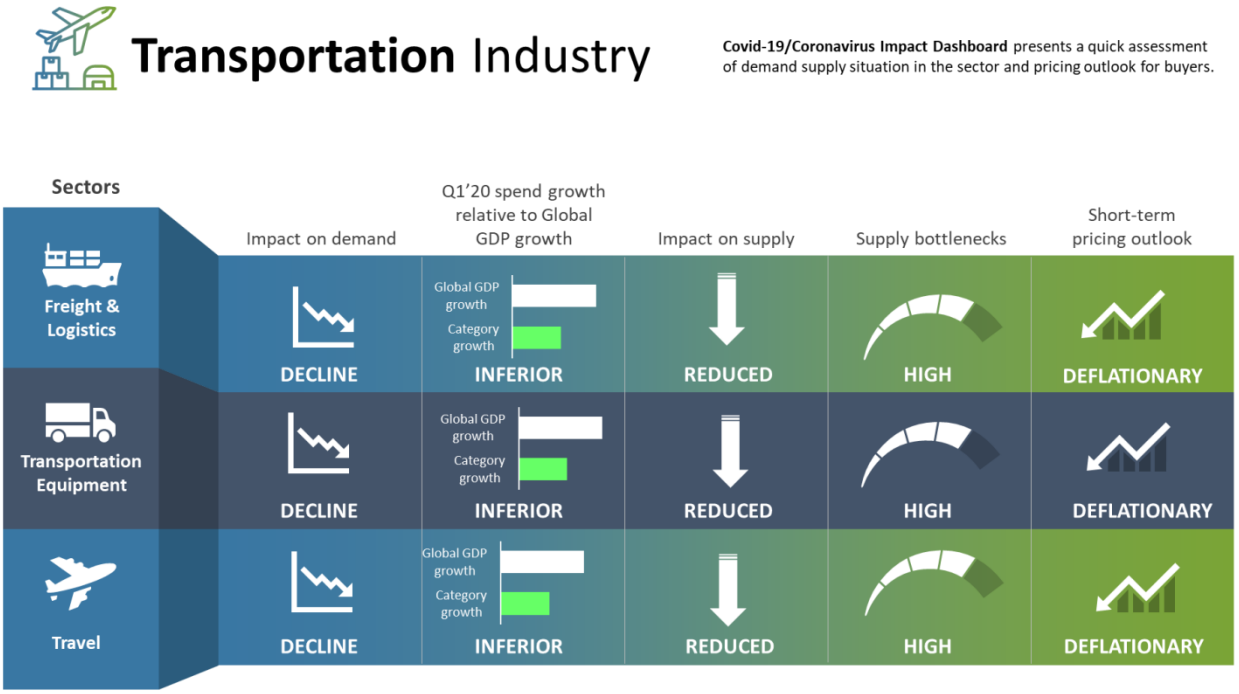


Figure 3.1 – Coronavirus impact dashboard for the freight and transportation industry

In fig. 3.2 is presented the main Measures for a sustainable plan to reduce the impact of corona virus on transportation

According the situation, that happened in Ukraine, The Cabinet of Ministers decided: to properly equip the checkpoint in emergency zones with mandatory sanitary inspection of citizens and a pass only after a medical examination and disinfection of vehicles; to involve the employees of the Ministry of Health, the National Police, the National Guard, the State Emergencies Ministry, the State Consumer Service to work at these points.

The Cabinet of Ministers of Ukraine extended the nationwide quarantine until June 22 and decided from May 22 to proceed to the second stage of mitigation of restrictive measures. This will allow the regional commissions on technological environmental safety and emergency situations to strengthen local anti-epidemic restrictions in case of outbreaks. They can also weaken them if it does not contradict established restrictions at the national level.

Development of mutual risk sharing strategy with suppliers

- Buyers and suppliers should work in collaboration with respect to identification of issues associated with transportation activities. One of the major areas where buyers and suppliers can collaborate in an effective manner is to constantly monitor new areas where quarantine measures are being deployed and identify alternate travel routes effectively

Usage of transportation/warehouse optimization software by suppliers

- Buyers should optimize usage of transportation and warehouse optimization software to streamline the procurement process. Usage of such software will ensure that buyers/suppliers optimize delivery routes and reduce fuel related costs. Warehouse optimization software will provide insights to buyers regarding space availability within warehouses, enabling buyers to plan transportation activities based on their ad-hoc/medium term/long term requirements

Alternative suppliers

- Develop relationship with vendors from countries that have a lower count of Covid related cases or are still working in a relatively normal environment. However, buyers must also be aware of increased prices in these geographical regions due to increase in demand

Holistic risk mitigation plan

- It is not enough to only look at production centers, it is essential for buyers to evaluate logistics related risks associated with delivery of the category and develop a procurement strategy accordingly

Round-the-clock monitoring

- Buyers need to be up to date of the global developments as well as country specific trends. Lockdown situation can change suddenly in locations that are of importance from a supply chain perspective. Buyers also need to monitor emerging success case studies and learn from them

Revisiting contract terms

- Global commodity and energy prices are expected to behave in a very volatile manner for some time. Companies that spend significantly on commodities and energy items as key inputs need to re-engage their suppliers and explore mechanisms to safeguard the upsides in pricing. It is advisable to fix the short-term procurement price or at least keep a maximum limit on upside price movements

Figure 3.2 – Measures for a sustainable plan to reduce the impact of corona virus on transportation

In general, started from the beginning of March 2019 there were published next regulatory documents to prevent the spread of coronavirus COVID-19 in Ukraine:

March 11, 2020 - Resolution of the Cabinet of Ministers of Ukraine № 211 “On prevention of the spread of COVID-19 coronavirus on the territory of Ukraine” [1].

March 13, 2020 - Order of the Ministry of Health of Ukraine from № 663 “On optimization of measures to prevent the introduction and spread of COVID-19 cases on the territory of Ukraine” [2].

March 13, 2020 - Decision of National Security and Defense of Ukraine “On urgent measures to ensure national security in the event of an outbreak of acute respiratory disease COVID-19 caused by coronavirus SARS – CoV-2 ″ Decree of the President of Ukraine №87 / 2020 decision put into effect [3].

March 13, 2020 - Order of the Cabinet of Ministers of Ukraine № 288-r "On temporary closure of some checkpoints across the state border and checkpoints and termination of pedestrian traffic in them" [4].

March 14, 2020 - Order of the Cabinet of Ministers of Ukraine № 287-r "On temporary restriction of crossing the state border, aimed at preventing the spread of acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2" [5].

March 14, 2020 - Order of the Cabinet of Ministers of Ukraine № 291-r “On temporary suspension of checkpoints of entry into and exit from the temporarily occupied territory of the Autonomous Republic of Crimea and the city of Sevastopol, aimed at preventing the spread of acute respiratory disease in Ukraine 19 caused by coronavirus SARS-CoV-2 ”[6].

March 14, 2020 - Order of the Cabinet of Ministers of Ukraine № 286-r "On evacuation of citizens of Ukraine and their families from the outbreak of acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2, in the Italian Republic" [7].

March 16, 2020 - Order of the Cabinet of Ministers of Ukraine № 215 “On Amendments to the Resolution of the Cabinet of Ministers of Ukraine of March 11, 2020 № 211” [8].

March 16, 2020 - Order of the Cabinet of Ministers of Ukraine № 290-r “On Amendments to the Order of the Cabinet of Ministers of Ukraine of March 14, 2020 № 287” [9].

March 16, 2020 - Decree of the President of Ukraine №88 / 2020 “On the Coordination Council for Counteracting the Proliferation of COVID-19” [10]

March 25, 2020 - Order of the Cabinet of Ministers of Ukraine № 338-r "On the transfer of a single state system of civil protection in an emergency situation" [11].

March 25, 2020 - Resolution of the Cabinet of Ministers of Ukraine № 239 "On Amendments to Certain Acts of the Cabinet of Ministers of Ukraine"

April 2, 2020 - Resolution of the Cabinet of Ministers of Ukraine № 255 "On Amendments to the Resolution of the Cabinet of Ministers of Ukraine of March 11, 2020 № 211"

April 8, 2020 - Resolution of the Cabinet of Ministers № 262 "On Amendments to the Resolution of the Cabinet of Ministers of Ukraine of March 11, 2020 № 211"

April 22, 2020 - Resolution of the Cabinet of Ministers № 291 "On Amendments to Certain Acts of the Cabinet of Ministers of Ukraine" (on extension of quarantine).

March 12, 2020 - Chairman of The Verkhovna Rada of Ukraine Dmytro Razumkov signed the order “On Additional Measures to Prevent the Occurrence of Acute Respiratory Disease”

March 17, 2020 - The Law “On Amendments to the Tax Code of Ukraine and Other Laws of Ukraine on Support of Taxpayers for the Period of Measures to Prevent the Occurrence and Spread of Coronavirus Disease (COVID-19)” was adopted

March 17, 2020 - The Law “On Amendments to Certain Legislative Acts of Ukraine Aimed at Preventing the Occurrence and Spread of Coronavirus Disease (COVID-19)” was adopted

April 13, 2020 - Law of Ukraine "On Amendments to the Law of Ukraine" On Protection of the Population from Infectious Diseases "on Prevention of the Spread of Coronavirus Disease (COVID-19)"

In Ukraine, from May 29, 2020, 66 checkpoints on the state border on the Ukrainian side were resume their work. Relevant changes concerning the operation of checkpoints were made by the Cabinet of Ministers of Ukraine in Order № 288 of March 13, 2020. As a result, 56 checkpoints remain temporarily closed. The State Border Guard Service of Ukraine informed about the resumption of checkpoints on the Ukrainian side of neighboring countries, including the EU and the Republic of Moldova, as the list of checkpoints that resume their work does not include checkpoints on the state border with Belarus and Russia [5].

In Ukraine, since March 16, 2020, 94 checkpoints on the border with other countries have been closed due to coronavirus (fig. 3.3).

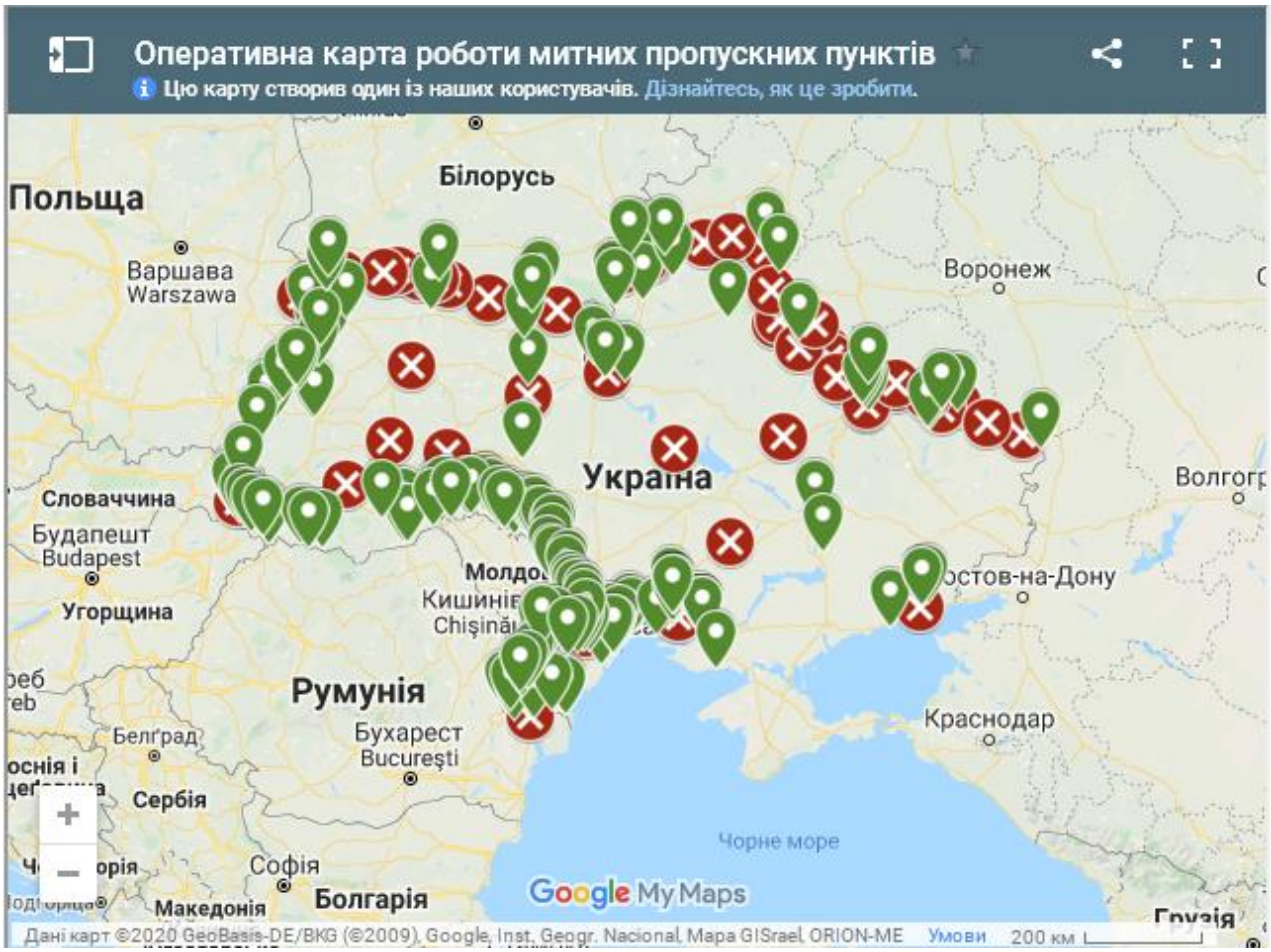


Figure 3.3 – Operational map of the work of customs checkpoints in Ukraine

The Customs Service reports that all large checkpoints will work, in particular major airports, ports, and ground checkpoints. They will restrict the pass only at certain local checkpoints, on pedestrian crossings, lightly loaded railway crossings. The customs repeated that the restrictions do not apply to international shipping.

With regard to truck drivers, crews of ships from other countries, they will be able to enter Ukraine, however, undergo a medical examination.

Restrictions for freight traffic since March 14:

1) The border between Italy and Slovenia Slovenia has limited the transit of freight vehicles from Italy to Slovenia. Traffic is permitted only if the final destination is Slovenia, or if the trucks are loaded with mail, medical equipment or pharmaceutical

products and humanitarian aid. Italy also plans to close its borders from Slovenia to Italy.

2) The border of Croatia - Slovenia: The border is closed to the movement of heavy vehicles and vehicles from Italy to Croatia.

3) The border between Hungary and Slovenia: The border is closed to all traffic from Italy to Hungary.

4) The border between Austria and Slovenia: There are currently no restrictions.

3.2 Self-isolation issues for drivers between trips after returning from abroad

Today, there are the following international deliveries under signed contracts for the supply of products from 2019-2020 by “KYHW” (fig. 3.4 – 3.13):

1. Kiev - Banska Stiavnica (Slovakia).

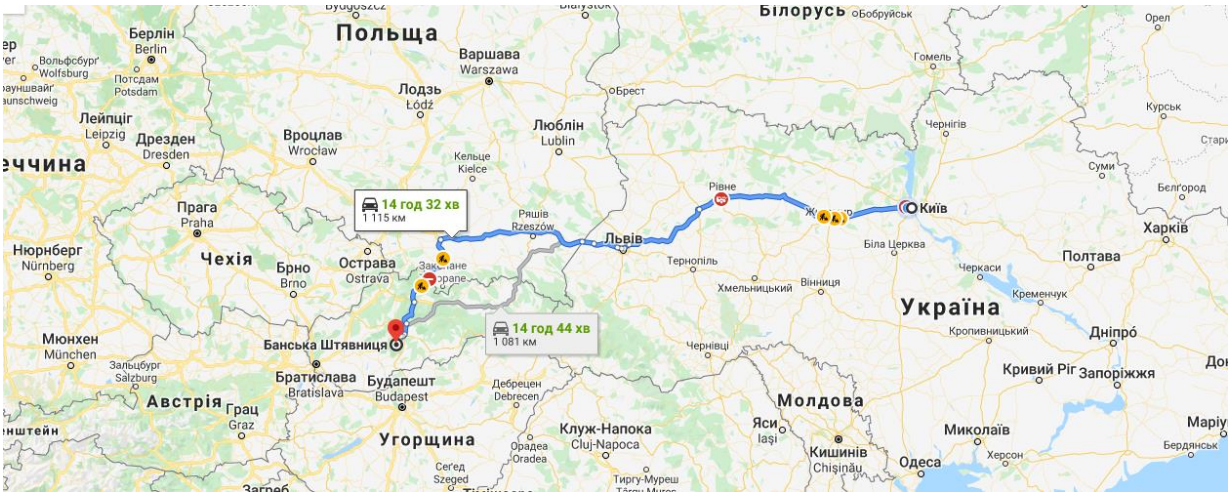


Figure 3.4 – Transportation delivery of biofuel to customers on the route 1

2. Kiev - Batcha (Slovakia).

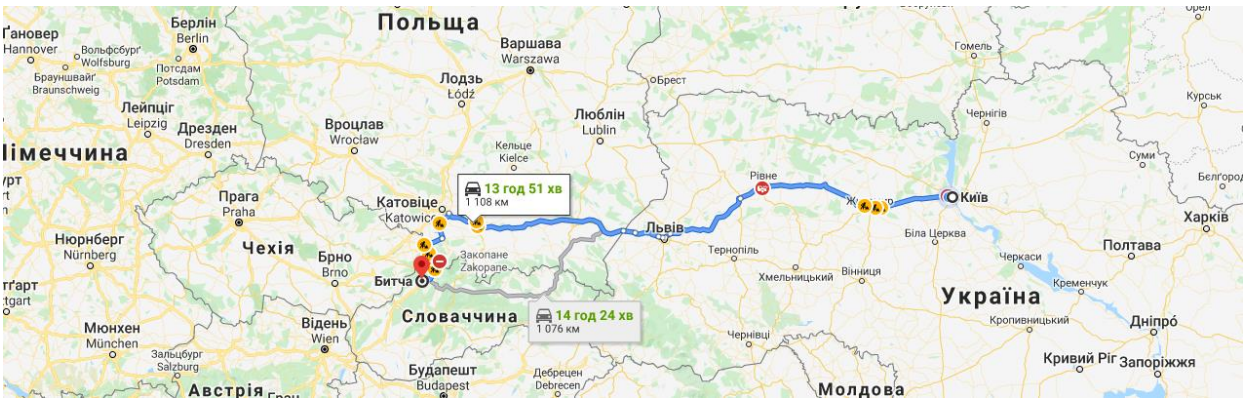


Figure 3.5 – Transportation delivery of biofuel to customers on the route 2

3. Kiev - Michalovce (Slovakia).

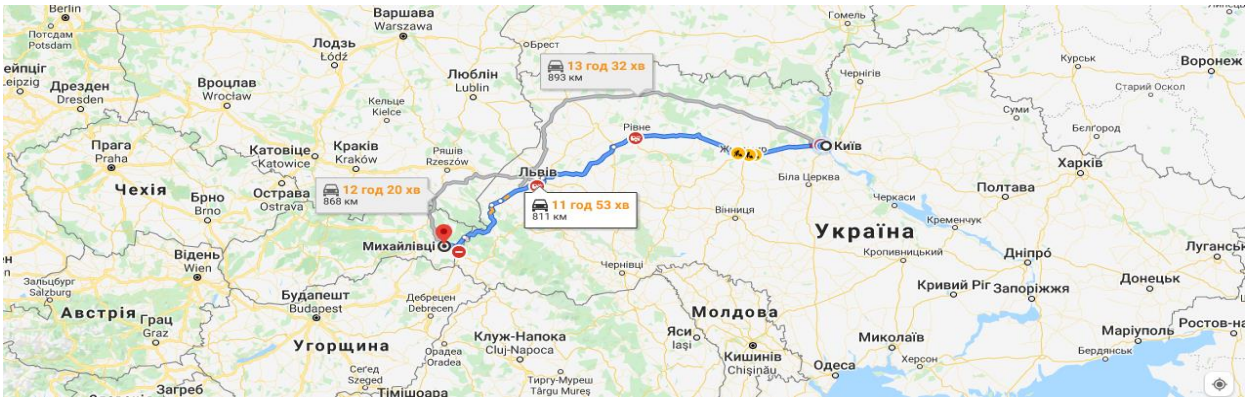


Figure 3.6 – Transportation delivery of biofuel to customers on the route 3

4. Kiev - Velki Krtish (Slovakia).

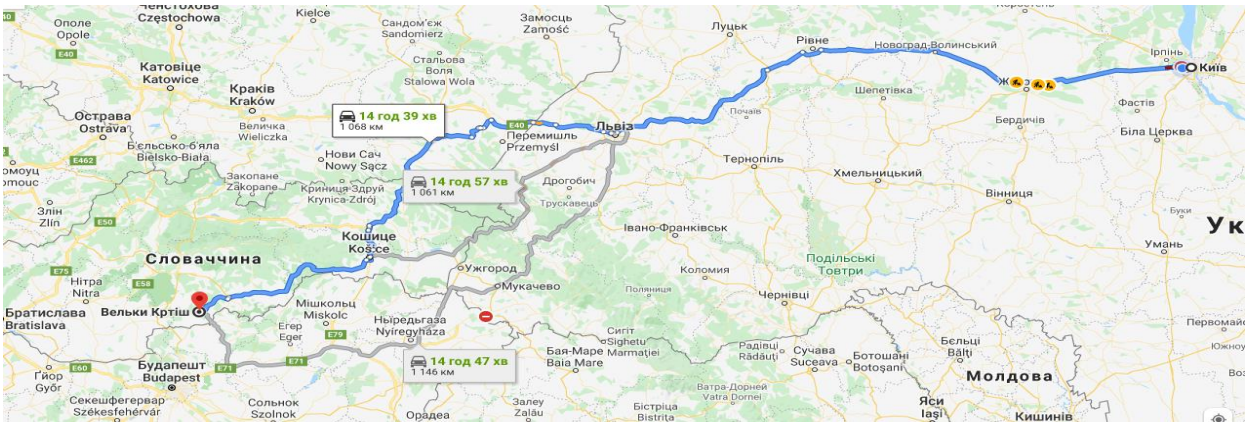


Figure 3.7 – Transportation delivery of biofuel to customers on the route 4

5. Kiev - Brezno (Slovakia).

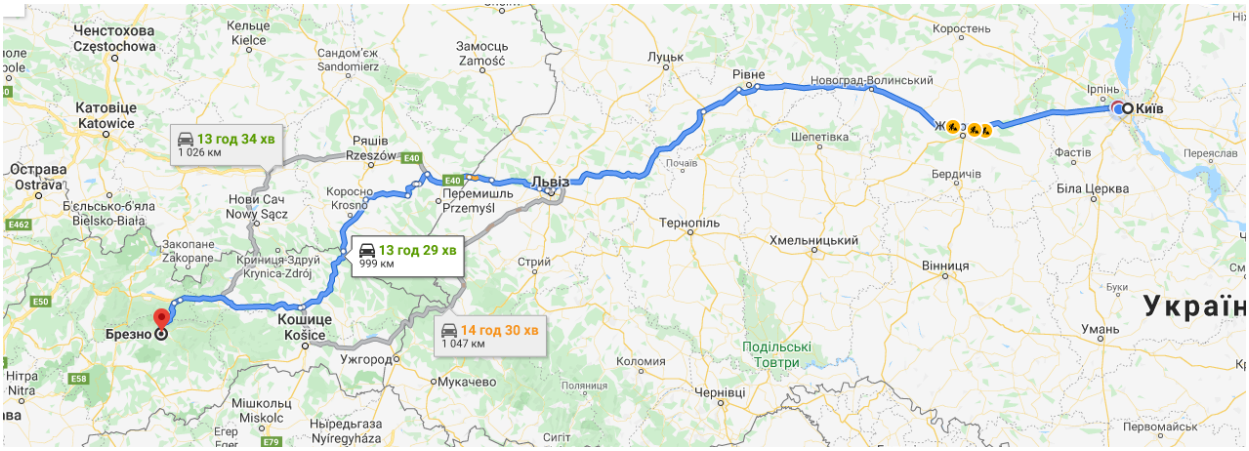


Figure 3.8 – Transportation delivery of biofuel to customers on the route 5

6. Kiev - Szczecin (Poland).

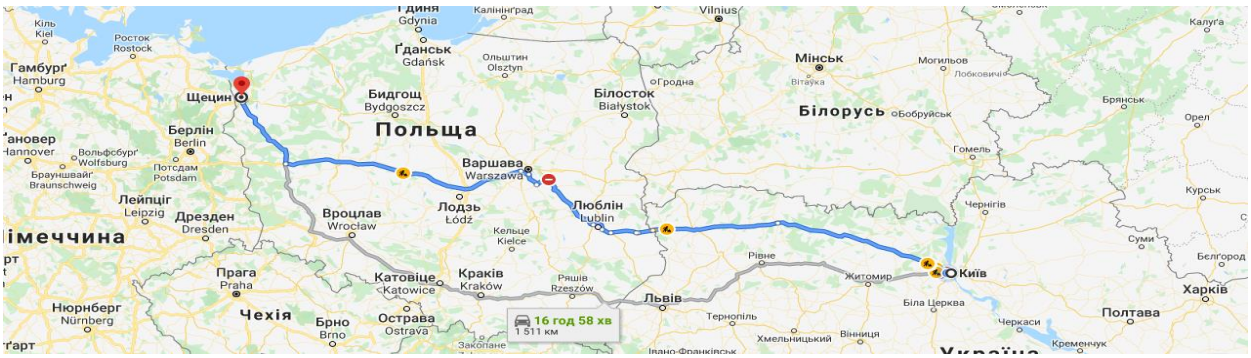


Figure 3.9 – Transportation delivery of biofuel to customers on the route 6

7. Kiev - Brno (Czech Republic).

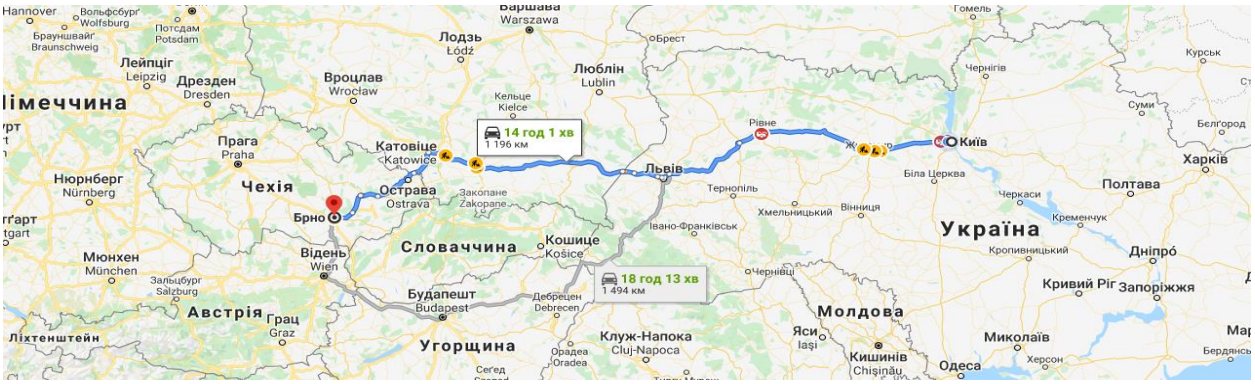


Figure 3.10 – Transportation delivery of biofuel to customers on the route 7

8. Kiev - Kaunas (Lithuania).

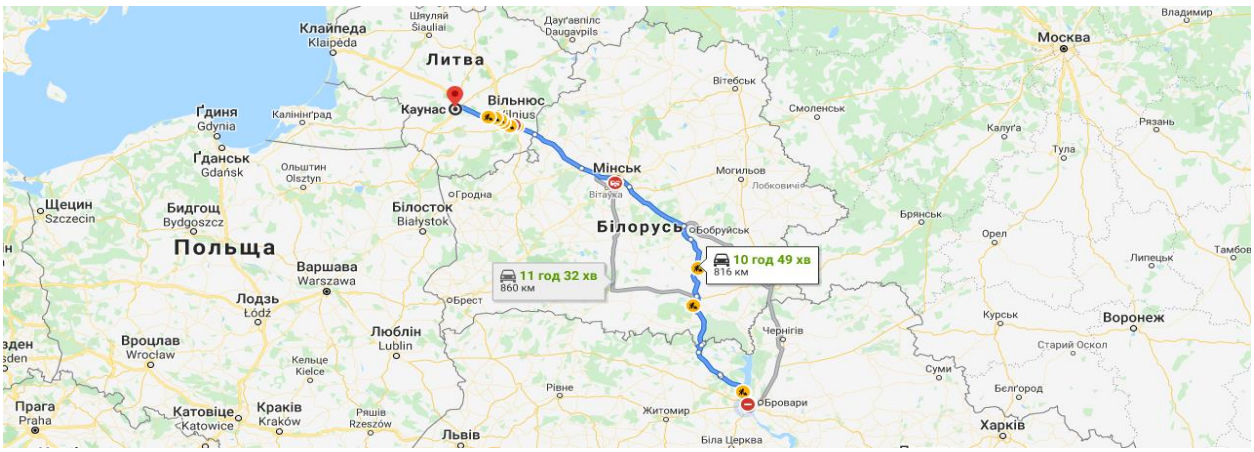


Figure 3.11 – Transportation delivery of biofuel to customers on the route 8

9. Kiev - Brest (Belarus).

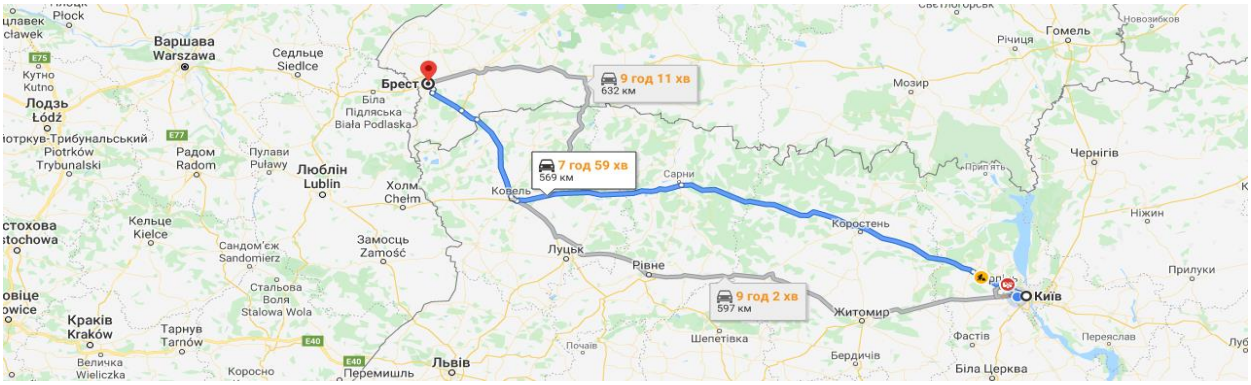


Figure 3.12 – Transportation delivery of biofuel to customers on the route 9

10. Kiev - Miskolc (Hungary).

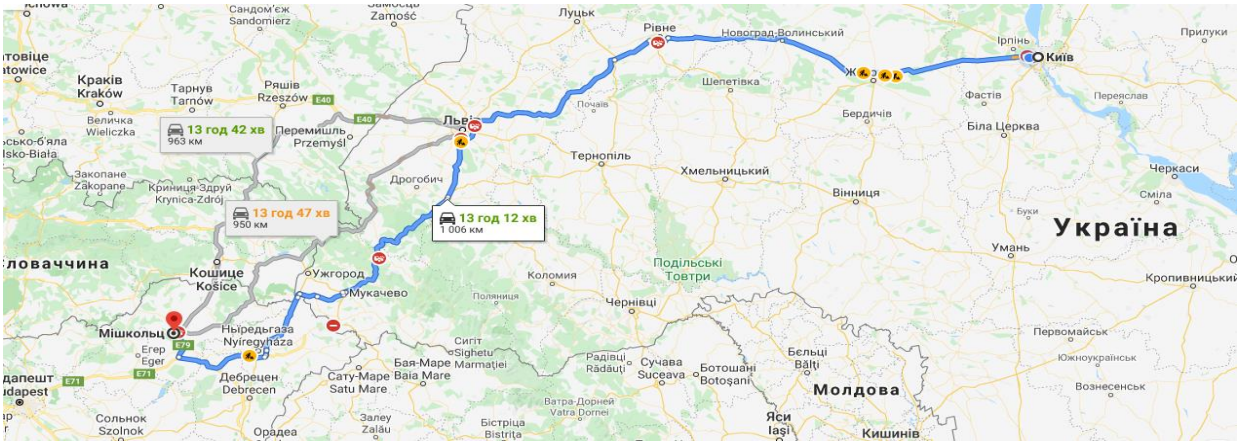


Figure 3.13 – Transportation delivery of biofuel to customers on the route 10

One of the main features of coronavirus is a long incubation period - up to 14 days can elapse from the onset of infection to the first symptoms. Therefore, in the

quarantine period, in many countries, a self-isolation regime is introduced, which applies to citizens who have arrived from countries with an unfavorable epidemiological situation for coronavirus.

The following information is provided by some countries on the rules and the need for self-isolation for persons arriving in the country, as well as persons to whom these rules do not apply.

Please note that the information will be updated in accordance with changes in the rules of self-isolation in different countries at the time of quarantine.

Poland. Persons arriving in Poland must undergo compulsory 14-day home quarantine, but professional drivers engaged in international freight transport or returning from abroad using other means of transport (in addition to vehicles that are transported by road) in order to receive rest or after receiving rest abroad, exempted from this duty.

Lithuania. According to the latest amendments to the Government Decision adopted on April 1, for drivers working in Lithuanian companies engaged in international commercial transport or engaged in international commercial transport on all types of vehicles, isolation is compulsory from the day of arrival in the Republic of Lithuania to the day of departure from its territory, but lasting no more than 14 days. The law does not prohibit drivers from other countries from leaving the country to return to their place of permanent residence immediately after the flight.

Belarus. Persons arriving in the Republic of Belarus from countries in which cases of COVID-19 infection are recorded must be self-insulated for 14 calendar days from the date of arrival in the Republic of Belarus and are not subject to subsequent passage through the State border of the Republic of Belarus (before the expiration of the self-isolation period). This measure does not apply to drivers of vehicles when performing international road transport of goods.

But drivers of vehicles after the completion of the international automobile transportation of goods in the territory of the Republic of Belarus, as well as drivers whose replacement occurred during the transit transportation, from countries in whose territory cases of COVID-19 infection are registered, are required to comply with the

requirements of the law for self-isolation before the start of the next transportation (flight) or within 14 calendar days.

It is also required that vehicle drivers, when performing international road transport on the territory of the Republic of Belarus, have personal protective equipment (medical masks, gloves) and use them when leaving the vehicle.

Slovakia. The contingency plan took effect March 13

- Freight will be allowed on national and international routes. Drivers should be equipped with protective equipment, and only those drivers who have temporary / permanent residence permits will be allowed to travel,

- Secondary border points will be closed.

CESMAD Slovakia has provided further clarification on the rules applicable to truck drivers:

- Slovak truck drivers returning to Slovakia are exempted from quarantine rules only if they carry out international transport and provided that they remain at home for the time spent in Slovakia. Any Slovak drivers returning to Slovakia in a passenger car must be quarantined for 14 days in accordance with applicable regulations;

- Foreign drivers engaged in international transportation of goods to / from Slovakia are also exempted from quarantine rules.

On May 21, the Slovak government extended border controls until June 26.

Ukraine. Persons arriving in Ukraine from countries or regions with local transmission of the respiratory disease COVID-19 caused by the SARS-CoV-2 coronavirus are subject to compulsory observation (isolation) in special institutions defined by local authorities, within 14 days after crossing the state border. The exception is drivers and maintenance staff of freight vehicles, if there is no reason to believe that they were in contact with a person infected with COVID-19.

The fact that a person has visited a country where coronavirus spreads does not mean that he has become infected. However, due to the incubation period during which symptoms appear, this possibility cannot be ruled out. For this reason, even if the measure of self-isolation does not apply to drivers of vehicles during international road transport of goods, we recall that compliance with the general rules of conduct in the

EU countries during quarantine is absolutely necessary for everyone (the main recommendations are presented in Appendix A):

–observe the rules of personal hygiene;

–minimize visits to public places by making only the necessary purchases in the nearest store or pharmacy;

–wear a face mask and disposable gloves in public places;

–do not move with a group of persons in an amount of more than two;

–avoid crowding and close contact (closer than 2 meters distance) with other people as much as possible.

3.3 Organization of drivers assignments for international routes

Among the client base of KYHW LLC there are regular customers, the organization of international transportation for which is quite stable. The strategy of working with clients in order to ensure the quality of service involves the selection of the optimal vehicle for order execution. One of the most important factors in the optimal transportation is the cost of it, because the competition in the market is quite high and the optimal pricing policy contributes to the retention of regular customers.

In order to optimize the transportation planning process, it is proposed to use the so-called assignment problem.

The assignment problem is one of the classical problems of integer optimization. Its essence is that there are n types of work and m candidates for their performance (performers). It is considered that each of the candidates $i \in \{1, .., n\}$ can perform any work $j \in \{1, .., m\}$ while cij is the efficiency of the work performed of the j-th type by the i-th candidate. Candidates must be distributed in such a way that each candidate receives a single assignment, each job receives a single contractor, and the total efficiency associated with the assignments is maximized.

The mathematical model of the assignment problem consists of an objective function and a number of constraints:

$$F(x) = \sum_{i=1}^{n} \sum_{j=1}^{m} c_{ij} \cdot x_{ij} \tag{3.1}$$

$$\sum_{i=1}^{n} x_{ij} = 1, \quad \sum_{j=1}^{m} x_{ij} = 1, \quad 0 \le x_{ij} \le 1 \tag{3.2}$$

where x_{ij} is a variable that becomes 1 if the i-th work is performed by the j-th executor and 0 otherwise.

Let's describe the source data. For cij the rate of the corresponding driver on transportation for 1 km depending on a direction of transportation is accepted. Such rates can be quite different. The number of routes on which it is necessary to carry out appointment of drivers makes 10. We will set rates for transportation on the corresponding routes in tab. 3.1

Table 3.1 – Rates for transportation on the relevant routes, dollars / km

Drivers	Routs									
	1	2	3	4	5	6	7	8	9	10
1	1,38	1,25	1,36	1,25	1,45	1,26	1,28	1,34	1,30	1,20
2	1,56	1,82	1,15	1,45	1,26	1,75	1,36	1,33	1,82	1,55
3	1,99	1,56	1,41	1,71	1,32	1,58	1,32	1,84	1,67	1,55
4	1,22	1,93	1,37	1,64	1,28	1,47	1,65	1,71	1,25	1,41
5	1,22	1,19	1,46	1,81	1,25	1,66	1,71	1,54	1,21	1,71
6	1,55	1,22	1,37	1,91	1,55	1,25	1,64	1,66	1,32	1,75
7	1,88	1,67	1,37	1,28	1,17	1,45	1,21	1,38	1,66	1,42
8	1,47	1,26	1,28	1,36	1,77	1,54	1,25	1,38	1,47	1,44
9	1,65	1,94	1,82	1,54	1,67	1,42	1,35	1,75	1,64	1,22
10	1,18	1,42	1,64	1,58	1,44	1,28	1,74	1,67	1,85	1,45

Since c_{ij} expresses the cost part, the objective function is to be minimal, because the duty is to minimize transportation costs.

In this case, the objective function takes the form:

$$F(x) = 1{,}38x_{11} + 1{,}25x_{12} + 1{,}36x_{13} + 1{,}25x_{14} + 1{,}45x_{15} + 1{,}26x_{16} + 1{,}28x_{17} +$$
$$+ 1{,}34x_{18} + 1{,}3x_{19} + 1{,}2x_{110} + 1{,}56x_{21} + 1{,}82x_{22} + 1{,}15x_{23} + 1{,}45x_{24} + 1{,}26x_{25}$$
$$+ 1{,}75x_{26} + 1{,}36x_{27} + 1{,}33x_{28} + 1{,}82x_{29} + 1{,}55x_{210} + 1{,}99x_{31} + 1{,}56x_{32} +$$
$$+ 1{,}41x_{33} + 1{,}71x_{34} + 1{,}32x_{35} + 1{,}58x_{36} + 1{,}32x_{37} + 1{,}84x_{38} + 1{,}67x_{39} +$$
$$+ 1{,}55x_{310} + 1{,}22x_{41} + 1{,}93x_{42} + 1{,}37x_{43} + 1{,}64x_{44} + 1{,}28x_{45} + 1{,}47x_{46} +$$
$$+ 1{,}65x_{47} + 1{,}71x_{48} + 1{,}25x_{49} + 1{,}41x_{410} + 1{,}22x_{51} + 1{,}19x_{52} + 1{,}46x_{53} +$$
$$+ 1{,}81x_{54} + 1{,}25x_{55} + 1{,}66x_{56} + 1{,}71x_{57} + 1{,}54x_{58} + 1{,}21x_{59} + 1{,}71x_{510} +$$
$$1{,}55x_{61} + 1{,}22x_{62} + 1{,}37x_{63} + 1{,}91x_{64} + 1{,}55x_{65} + 1{,}25x_{66} + 1{,}64x_{67} +$$
$$+ 1{,}66x_{68} + 1{,}32x_{69} + 1{,}75x_{610} + 1{,}88x_{71} + 1{,}67x_{72} + 1{,}37x_{73} + 1{,}28x_{74} +$$
$$+ 1{,}17x_{75} + 1{,}45x_{76} + 1{,}21x_{77} + 1{,}38x_{78} + 1{,}66x_{79} + 1{,}42x_{710} + 1{,}47x_{81} +$$
$$+ 1{,}26x_{82} + 1{,}28x_{83} + 1{,}36x_{84} + 1{,}77x_{85} + 1{,}54x_{86} + 1{,}25x_{87} + 1{,}38x_{88} +$$
$$1{,}47x_{89} + 1{,}44x_{810} + 1{,}65x_{91} + 1{,}94x_{92} + 1{,}82x_{93} + 1{,}54x_{94} + 1{,}67x_{95} +$$
$$+ 1{,}42x_{96} + 1{,}35x_{97} + 1{,}75x_{98} + 1{,}64x_{99} + 1{,}22x_{910} + 1{,}18x_{101} + 1{,}42x_{102} +$$
$$+ 1{,}64x_{103} + 1{,}58x_{104} + 1{,}44x_{105} + 1{,}28x_{106} + 1{,}74x_{107} + 1{,}67x_{108} +$$
$$1{,}85x_{109} + 1{,}45x_{1010} \to \min$$

There are several methods for solving the assignment problem, such as the Hungarian method. We will use MS Excel. The first step is to enter the source data into the program. The next step is to enter all the formulas that describe the objective function and constraints. Formulas for calculating the problem are given in table. 3.2.

Table 3.2 - Formulas for calculation in MS Excel

№	Object of mathematical model	Explanation in MS Excel
1	2	3
1	Variables (cell M27)	B16:K25
2	Target function	=СУММПРОИЗВ(B3:K12;B16:K25)
3	Line restrictions:	
4	L16…	=СУММ(B16:K16)…
5	L25	=СУММ(B25:K25)
6	Column restrictions:	
7	B26…	=СУММ(B16:B25)
8	K26	=СУММ(K16:K25)

The problem is solved directly using the “Solver” function, the appearance of the dialog box of the function with the entered parameters is shown in Fig. 3.14.

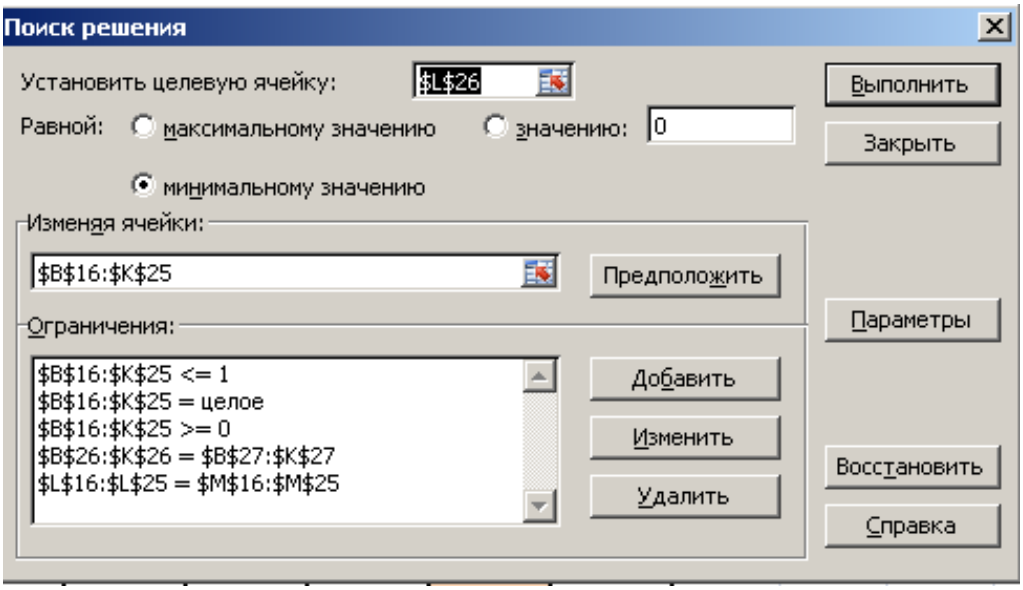
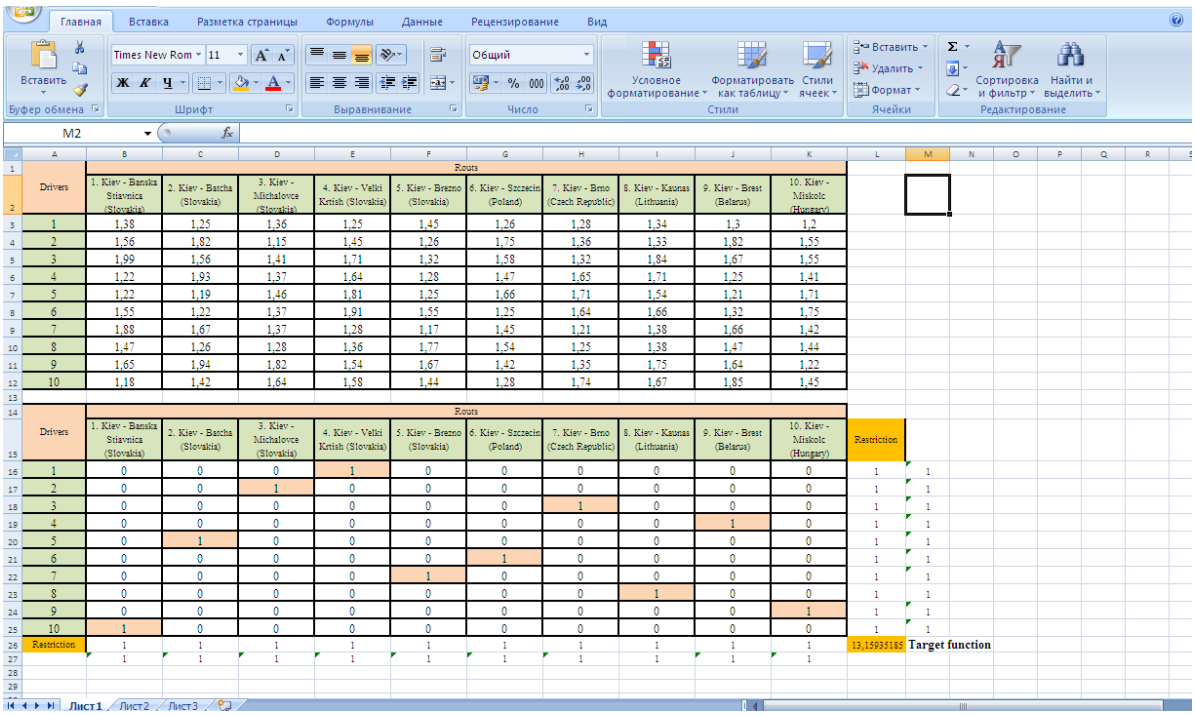


Figure 3.14 – An example of filling out “Solver”

When all the initial data and the specified parameters are entered, we search for the optimal value. The result of the optimal destination of drivers on the routes is shown in Fig. 3.15.



Drivers	1. Kiev - Banska Stiavnica (Slovakia)	2. Kiev - Batcha (Slovakia)	3. Kiev - Michalovce (Slovakia)	4. Kiev - Velki Krtish (Slovakia)	5. Kiev - Brezno (Slovakia)	6. Kiev - Szczecin (Poland)	7. Kiev - Brno (Czech Republic)	8. Kiev - Kaunas (Lithuania)	9. Kiev - Brest (Belarus)	10. Kiev - Miskolc (Hungary)
1	1,38	1,25	1,36	1,25	1,45	1,26	1,28	1,34	1,3	1,2
2	1,56	1,82	1,15	1,45	1,26	1,75	1,36	1,33	1,82	1,55
3	1,99	1,56	1,41	1,71	1,32	1,58	1,32	1,84	1,67	1,55
4	1,22	1,93	1,37	1,64	1,28	1,47	1,65	1,71	1,25	1,41
5	1,22	1,19	1,46	1,81	1,25	1,66	1,71	1,54	1,21	1,71
6	1,55	1,22	1,37	1,91	1,55	1,25	1,64	1,66	1,32	1,75
7	1,88	1,67	1,37	1,28	1,17	1,45	1,21	1,38	1,66	1,42
8	1,47	1,26	1,28	1,36	1,77	1,54	1,25	1,38	1,47	1,44
9	1,65	1,94	1,82	1,54	1,67	1,42	1,35	1,75	1,64	1,22
10	1,18	1,42	1,64	1,58	1,44	1,28	1,74	1,67	1,85	1,45

Drivers	1. Kiev - Banska Stiavnica (Slovakia)	2. Kiev - Batcha (Slovakia)	3. Kiev - Michalovce (Slovakia)	4. Kiev - Velki Krtish (Slovakia)	5. Kiev - Brezno (Slovakia)	6. Kiev - Szczecin (Poland)	7. Kiev - Brno (Czech Republic)	8. Kiev - Kaunas (Lithuania)	9. Kiev - Brest (Belarus)	10. Kiev - Miskolc (Hungary)	Restriction	
1	0	0	0	1	0	0	0	0	0	0	1	1
2	0	0	1	0	0	0	0	0	0	0	1	1
3	0	0	0	0	0	0	1	0	0	0	1	1
4	0	0	0	0	0	0	0	0	1	0	1	1
5	0	1	0	0	0	0	0	0	0	0	1	1
6	0	0	0	0	0	1	0	0	0	0	1	1
7	0	0	0	0	1	0	0	0	0	0	1	1
8	0	0	0	0	0	0	0	1	0	0	1	1
9	0	0	0	0	0	0	0	0	0	1	1	1
10	1	0	0	0	0	0	0	0	0	0	1	1
Restriction	1	1	1	1	1	1	1	1	1	1	13,15935185	Target function
	1	1	1	1	1	1	1	1	1	1		

Figure 3.15 – Screen form for solving the assignment problem

According to the optimal distribution of drivers on the routes we get the following appointments:

driver №1 - performs route 4 (Kiev - Velki Krtish (Slovakia));

driver №2 - performs route 3 (Kiev - Michalovce (Slovakia));

driver №3 - performs route 7 (Kiev - Brno (Czech Republic));

driver №4 - performs route 9 (Kiev - Brest (Belarus));

driver №5 - performs route 2 (Kiev - Batcha (Slovakia));

driver №6 - performs route 6 (Kiev - Szczecin (Poland));

driver №7 - performs route 5 (Kiev - Brezno (Slovakia));

driver №8 - performs route 8 (Kiev - Kaunas (Lithuania));

driver №9 - performs route 10 (Kiev - Miskolc (Hungary));

driver №10 - performs route 1 (Kiev - Banska Stiavnica (Slovakia));

The minimum total cost per 1 km will be $ 13,16 per 1 km.

3.4 Chapter 3 summary

Project part of diploma thesis is devoted to the recommendation of the organization of goods delivery in quarantine conditions for “KYHW” ltd. Road transport plays a large role in the transport system of both Ukraine and the world. Without automobile transport, not a single supply chain can be imagined. The organization of the road transport process includes regulatory aspects, technical, economic, technological, etc. The aim of the project section of the thesis was to develop proposals for improving the process of organizing international transport.

The pandemic-induced clampdown of geographical corridors and restrictions imposed on cross-country mobility of goods are some of the factors that are carrying serious implications for the freight and transportation industry. A sudden slump in demand owing to the slowdown in economic activities across the key end-user sectors and restricted passenger mobility have eschewed growth prospects in the freight and transportation industry.

However, suppliers in the freight and transportation industry have the inherent bottlenecks within global goods supply chains to address which have gotten worse with the intensifying coronavirus impact.

One of the proposals was the application of the so-called assignment task for choosing the optimal drivers for regular flights, which are formed on the basis of long-term agreements with regular customers. The parameter taken as the basis for the optimization is the transportation rate for 1 km. This method allows you to thus distribute drivers to perform routes, the cumulative rate per 1 km acquires a minimum value.

CONCLUSIONS AND RECOMMENDATIONS

Urgency of the research is due to the nature of the coronavirus impact on the freight and transportation industry and the interdependence between buyers and suppliers in this industry reinstate the importance of collaboration between both the parties to identify issues associated with transportation activities. One of the major areas where buyers and suppliers can collaborate in an effective manner is to constantly monitor new areas where quarantine measures are being deployed and identify alternate travel routes effectively.

The nature of the coronavirus impact on the freight and transportation

Commodity and energy prices are expected to undergo frequent volatilities as the coronavirus impact intensifies on the global economy. This should be the cue for buyers who account for significant investments on commodities and energy items to re-engage their suppliers and explore strategies to immune them from the price volatilities. In the freight and transportation industry, it is advisable to fix the short-term procurement price or at least keep a maximum limit on upside price movements.

The theoretical part of the thesis is devoted to the impact of the global pandemic on business development. Particular attention is paid to the further development of the logistics industry.

The basic measures and regulation during quarantine of the regions of the world were described.

The logistics industry reacts sharply to any weakening in trade flows, making the industry particularly vulnerable to COVID-19. Foresees a severe decline in demand. Its expected prolonged production downtimes, leading to a lasting decline in demand for logistics services. The industry will also face increased risk from further lockdowns in major regions.

Governments across countries have stepped in to revive the ailing enterprises in the freight and transportation industry as the demand curve has taken a nosedive owing to the coronavirus impact.

The second part of diploma thesis is devoted to influence of the COVID-19 pandemic to entire globe economy. The Analysis of the logistics market of Ukraine: trends, difficulties and opportunities were considered.

Also it was analyzed the activity of the “KYHW”Ltd in the market of oil and chemical products for over 7 years. The main activity of the company is the sale of products for the food industry, the chemical industry, the sale of fuel materials, as well as the production of wooden containers. The company cooperates with manufacturers without intermediaries, and this makes it possible to establish competitive prices. Today “KYHW” Ltd can offer the widest assortment of products of extremely high quality from proven manufacturers.

“KYHW” Ltd is engaged in wholesale and retail sale of petroleum products, offering the most favorable conditions for the purchase of summer and winter diesel fuel, gasoline and gas. The main direction of work is the production and sale of pallets, europallets.

The company works in order to perform its work with high quality and inspiration so that clients, society, business partners, employees, receive a positive charge in any situation and perceive “KYHW” Ltd as a reliable partner.

For “KYHW” Ltd, the main production indicators are the volume of products sold by types of products in the company's services. The growth of sales in ths. Uah annually increases. However, the correct policy of “KYHW” Ltd plant in expanding the range of products and offers for integrated customer service has increased the company's profitability. Today the share of sold services of “KYHW” Ltd is almost the same, only by 10% on average less than the retail trade in chemical products compared to the manufacture of wooden containers (which was 37.7% in 2019) and retail and wholesale fuel and its products (respectively, is 33.7%).

Thus, summing up the dynamics of the main indicators of the use of current assets, it is worth noting that sales revenue for the periods under review grew and ensured a growth rate of 13.4% in 2017 and 112.73% in 2019. This trend of this indicator is quite a positive phenomenon for the enterprise. Also, an increase in the amount of revenue from sales indicates a more efficient sales and production activity.

Project part of diploma thesis is devoted to the recommendation of the organization of goods delivery in quarantine conditions for “KYHW” ltd. Road transport plays a large role in the transport system of both Ukraine and the world. Without automobile transport, not a single supply chain can be imagined. The organization of the road transport process includes regulatory aspects, technical, economic, technological, etc. The aim of the project section of the thesis was to develop proposals for improving the process of organizing international transport.

The pandemic-induced clampdown of geographical corridors and restrictions imposed on cross-country mobility of goods are some of the factors that are carrying serious implications for the freight and transportation industry. A sudden slump in demand owing to the slowdown in economic activities across the key end-user sectors and restricted passenger mobility have eschewed growth prospects in the freight and transportation industry.

However, suppliers in the freight and transportation industry have the inherent bottlenecks within global goods supply chains to address which have gotten worse with the intensifying coronavirus impact.

One of the proposals was the application of the so-called assignment task for choosing the optimal drivers for regular flights, which are formed on the basis of long-term agreements with regular customers. The parameter taken as the basis for the optimization is the transportation rate for 1 km. This method allows you to thus distribute drivers to perform routes, the cumulative rate per 1 km acquires a minimum value.

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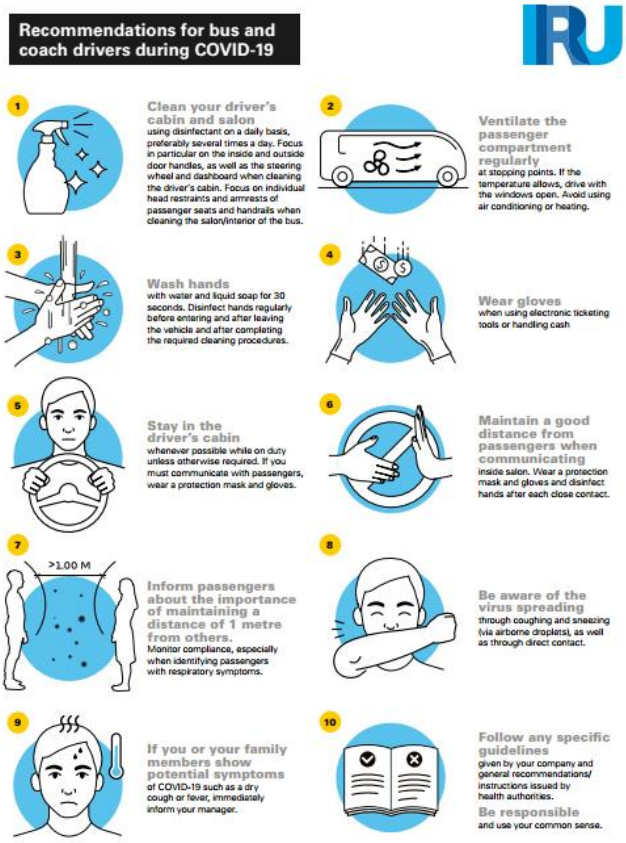
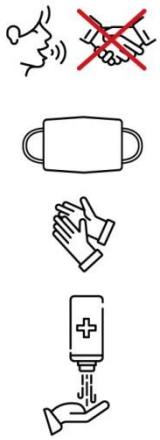
Appendix A

Customer recommendations at loading / unloading (for drivers)



РЕКОМЕНДАЦИИ КЛИЕНТОВ ДЛЯ ВОДИТЕЛЕЙ ПРИ ПОГРУЗКЕ / РАЗГРУЗКЕ ДЛЯ ВАШЕЙ СОБСТВЕННОЙ БЕЗОПАСНОСТИ И БЕЗОПАСНОСТИ ДРУГИХ ЛЮДЕЙ ПРИ СОБЛЮДЕНИИ УСИЛЕННЫХ ГИГИЕНИЧЕСКИХ МЕР:



- **Если возможно, пожалуйста, заполните CMR перед въездом на территорию клиента.**
- **Если клиент просит заполнить анкету с вопросами о странах, которые вы посещали, и о вашем самочувствии, пожалуйста, заполните и ответьте на все вопросы искренне.**
- **Следуйте установленным клиентом рекомендациям и инструкциям в зоне обслуживания.**
- **Держите дистанцию с другими людьми не менее 2 метров и избегайте мест массового скопления людей.**
- **Не пожимайте руки, достаточно просто поздороваться.**
- **Носите защитные маски.**
  Если у вас нет маски, пожалуйста, купите сами, и мы возместим вам расходы согласно предоставленному чеку.
  Если вы не можете найти, где можно купить маску, сделайте её из стерильных средств в соответствии с подготовленными инструкциями.
  Мы возместим вам расходы согласно предоставленному чеку.
- **При передаче документов надевайте перчатки.**
  Если у вас нет перчаток, пожалуйста, купите сами, и мы возместим вам расходы согласно предоставленному чеку.
- **Регулярно мойте и дезинфицируйте руки - процесс должен занять не менее 20 секунд. Старайтесь не касаться лица руками.**
- **Если вы кашляете или чихаете, делайте это только в согнутый локоть, а не в ладонь. Используйте салфетки.**
- **Если вы плохо себя чувствуете, а также если у вас или ваших близких есть вопросы – обратитесь к своему менеджеру или задайте их по электронной почте wecare@girteka.eu.**