

WAR AS A CHALLENGE TO ROAD SAFETY: DAMAGE TO SOCIETY AND THE ECONOMY OF UKRAINE*

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Abstract. *Purpose of the article.* Russia's armed aggression against Ukraine has become a real challenge and threat to Ukrainian society in various aspects of life. The lack of financial resources due to the defensive nature of the economy caused by the war makes it difficult to ensure road safety in Ukraine and to prevent deaths and injuries on the roads. The topical issue of the state of road safety in Ukraine is also related to its European integration course, as road safety is a priority European policy task for EU member states. *The aim* of this article is to conduct a criminological analysis of the state of road safety in Ukraine during the war, and to determine the damage caused by road traffic injuries and fatalities to the Ukrainian economy and society as a whole, taking into account the war situation. *Research conclusion.* The assessment of the state of road safety in Ukraine is based on official statistical information from the General Prosecutor's Office and the Department of Patrol Police, and the theoretical conclusions are based on the results of an anonymous survey of Ukrainian drivers on their compliance with traffic rules. The study of the level of road traffic accidents with fatalities and injuries in Ukraine has shown that the state of road safety deteriorated during the war in comparison with the pre-war period. The impact of the war on this condition is diverse and depends on the dislocation of the region in Ukraine and the intensity of combat operations in a given area. It has been established that among the factors significantly influencing the quantitative and qualitative indicators of violations in the field of road safety during the war, the most significant are the destruction of objects of road and transport infrastructure, a decrease in the effectiveness of patrol police activities, the construction of road fortifications, etc. The article also reveals the characteristics of the road safety system in wartime, emphasising the inadmissibility of extrapolating the state of road safety from the pre-war period to wartime, including in the direction of preventing violations in this area.

Key words: war, road safety, road deaths and injuries, traffic violations, Vision Zero, economic losses.

JEL Classification: K10

1. Introduction

The numerous factors and circumstances affect modern society, some of which have a negative character, posing threats to humanity. Most of these threatening risks have been systematized by the United Nations in the Sustainable Development Goals, designed for the year 2030. In this context, among the seventeen priority goals of the global community,

special attention is given to Goal № 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation; Goal № 11 Make cities inclusive, safe, resilient and sustainable; and Goal № 16: Promote just, peaceful and inclusive societies (Sustainable Development Goals).

A common area for these goals is road traffic and transport operation. Various innovations and

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technologies are being implemented in this sphere to ensure productivity and safety.

According to estimates from the World Health Organization (WHO), road safety worldwide is extremely poor. In 2018, statistical data indicated that up to 1.35 million people die on the roads every year, meaning that a road user's death is recorded every 24 seconds. Road traffic fatalities are the primary cause of death for children aged 5-14 and young people aged 15-29. Road traffic accidents are the eighth leading cause of death worldwide. In poor and economically vulnerable countries, road traffic mortality and injuries account for 13% of all road traffic deaths, despite having only 1% of the world's motor vehicles (Global Status Report on Road Safety 2018).

As for Ukraine, the latest indicator remains relevant, as according to the Ministry of Finance of Ukraine, its GDP in 2020 will amount to only 3,540 euros per person (Gross Domestic Product (GDP) in Ukraine). Unfortunately, due to the ongoing war, Ukraine's economy has contracted by at least one-third as of 2022. The Ministry of Economy has preliminarily estimated a 30.4% drop in GDP for 2022. Ukraine has one of the lowest levels of road safety among all European countries, with 85 deaths per 1 million population in 2020 (Holovkin, 2022). This is twice as high as the EU's rate of 42 deaths per 1 million people in the same year. In comparison, Norway has the best road safety level in the world, with only 17 deaths per 1 million population in 2020 (Road safety targets: Monitoring report).

United Nations Goal 16 is of fundamental importance for global society in the 21st century. Unfortunately, it is particularly relevant for Ukraine under the conditions of full-scale Russia's aggression. According to UN assessments, current and emerging violent conflicts around the world are hampering the path to global peace. By 2022, the number of civilian deaths related to armed conflict will have increased by more than half, mainly due to the war in Ukraine (Goal 16: Promote just, peaceful and inclusive societies).

Russia's armed aggression against Ukraine and the lack of material resources due to the defensive nature of the economy caused by the war complicate transport safety in Ukraine (Batyrgareieva, 2023). The war has effectively paralysed the transport system in Ukraine, as highlighted by the International Transport Forum (ITF) (Transport and the War in Ukraine), causing significant damage to this sector of the Ukrainian economy. On the first day of the Russia's invasion of Ukraine, air traffic was suspended due to the blockade by Russian military and naval forces in the Azov and Black Seas, and sea transport was suspended due to the blockade of the Kerch Strait. There were also significant changes in the

functioning of road transport, especially in the frontline regions and areas where active combat operations are taking place.

Road accidents have not only their own "cost" in terms of road user deaths and injuries, implementation of measures to influence driver behaviour (Kimberlee, 2014; Why policy makers should stop using the word 'war' when talking about road safety measures) and efforts to build a comfortable and safe urban environment (Evans, 2022), but also civilian deaths as a result of Russian shelling while using the roads.

Moreover, for EU Member States where road safety is a priority of European policy (Sustainable and Smart Mobility Strategy – putting European transport on track for the future; EU Road Safety Policy Framework 2021–2030 – Recommendations on next steps towards "Vision Zero"; European Parliament transport committee backs 2030 road safety programme), the assessment of the road safety status of Ukraine – a candidate for EU accession since June 2022 – is undoubtedly a relevant topic for discussion.

The purpose of the article is to provide a criminological analysis of the state of road traffic safety in Ukraine in wartime, and also to determine the economic and social losses from road traffic injuries and deaths as a result of road accidents, taking into account the wartime situation.

The research methodology includes:

- Assessment of the current state and trends of road traffic accidents, as well as the level of deaths and injuries among road users in Ukraine;
- comparison of the number of road safety violations in wartime with the pre-war period;
- identification of the circumstances that influenced the level of deaths and injuries as a result of road accidents in Ukraine in wartime;
- description of the characteristic features of the state and other parameters of road safety in wartime;
- determination of losses for the Ukrainian economy as a result of premature deaths of people involved in road traffic and for the Ukrainian automotive industry, taking into account the wartime situation.

The assessment of road safety in Ukraine is based on official statistical information from the General Prosecutor's Office and the Patrol Police Department – the main body responsible for implementing policies in Ukraine aimed at identifying and preventing road traffic offences and reducing road traffic fatalities and injuries.

The theoretical conclusions are based on the results of empirical research, specifically an anonymous survey of Ukrainian drivers regarding their compliance with traffic rules. The survey was conducted through independent completion of a Google form using a provided QR code. The survey was conducted from August to October 2023

and included 969 respondents. The demographic distribution of the respondents is as follows: gender (62.6% male, 37.4% female), age (18-29 years – 19.3%, 30-44 years – 61.1%, 45-59 years – 16.8%, 60-70 years – 2.3%, over 70 years – 0.5%), geographical distribution (Central Ukraine – 10.2%, Northern Ukraine – 70.4%, Southern Ukraine – 5.7%, Eastern Ukraine – 6.3%, Western Ukraine – 7.4%).

The survey did not include drivers from Russia's annexed Crimea and certain temporarily occupied territories in the Kharkiv, Luhansk, Donetsk, Zaporizhzhia and Kherson regions of Ukraine. However, 81.9% of respondents live in Ukrainian territories that are currently frontline regions or were occupied by Russia in 2022 and subsequently liberated.

2. State and Dynamics of Road Safety in Ukraine

During the war, in 2022 (the war period), the overall crime rate increased from 321,443 to 362,636 recorded offences compared to 2021. However, there are contrasting trends in the dynamics of different types of crime: some tend to decrease, while others show a significant increase. The tendency to decrease in many categories of crimes in 2022 is confirmed by researchers (Yagunov, 2022).

As for offences against traffic safety and vehicle operation, their level decreased by 5.5%, from 13,493 offences in 2021 to 12,755 in 2022. This trend can be observed in connection with the most typical criminal offence in Ukraine and many other countries, including European ones, namely the criminal violation of traffic rules or vehicle operation by individuals driving vehicles (Article 286 of the Criminal Code of Ukraine). Specifically, 7,961 such offences were recorded in 2021 and 6,366 in 2022 (-20%). As a result of these offences, 1,507 people lost their lives in 2021 and the number fell to 1,270 in 2022 (-15.7%) (Unified report on criminal offences for January-December 2021–2022).

The imposition of martial law in Ukraine changed the situation on the country's roads by introducing strict requirements to ensure state and public security. The war factor apparently led to a reduction in the number of offences (Shramko, Kalinina, 2022). However, this is only a superficial observation.

The anonymous survey conducted among Ukrainian drivers asked two questions: 1) "Have you been involved in a road traffic accident before the imposition of martial law in Ukraine in 2017–2021?" and 2) "Have you been involved in a road traffic accident during the period of martial law in Ukraine (2022–2023)?" The first question was answered in the affirmative by 21.4% of respondents, while the second question was answered in the affirmative by only 8.6% of respondents. This means that in the five

pre-war years (2017–2021), an average of 4,28% of respondents were involved in a road accident each year, while in the two war years (2022–2023), 4,3% of respondents were involved. Thus, almost identical figures were obtained, indicating that the actual (unofficial statistical) level of road safety in Ukraine has not changed, at least during the periods compared.

In this context, some researchers rightly conclude that despite the official decrease in the number of traffic violations, "there is no tendency to decrease their actual quantity" (Khrystych, 2022). Other researchers add that changes have occurred due to the introduction of a new article, 286-1, into the Criminal Code of Ukraine in 2021, which establishes criminal responsibility for violations of traffic safety or vehicle operation rules by persons driving vehicles under the influence of alcohol (Novikov, 2023). These changes have affected the accuracy of the comparison of offences in 2021 and 2022. Taking this into account, the decrease in the number of offences under Article 286 of the Criminal Code is in reality much smaller than officially stated.

Such a conclusion requires additional justification, which is provided by the analysis of statistics from the Department of Patrol Police of Ukraine (Table 1).

Table 1

Data from the Patrol Police Department on road traffic accidents by oblasts of Ukraine in 2021–2022

Oblast	Accidents involving fatalities or injuries		
	2021	2022	% change
Vynnytsia	50	57	+14
Volyn	51	51	0
Dnipropetrovsk	172	168	-2,3
Donetsk	101	32	-68,3
Zhytomyr	63	68	+7,9
Zakarpattia	38	34	-10,5
Zaporizhzhia	85	70	-17,6
Ivano-Frankivsk	74	91	+23,0
Kyiv	129	137	+6,2
Kyiv City	176	159	-9,7
Kirovohrad	51	60	+17,6
Luhansk	28	0	
Lviv	146	167	+14,4
Mykolaiv	89	73	-18,0
Odesa	114	147	+28,9
Poltava	78	69	-11,5
Rivne	45	37	-17,8
Sumy	63	43	-31,7
Ternopil	51	59	+15,7
Kharkiv	158	132	-16,5
Kherson	43	5	-88,4
Khmelnyskyi	62	73	+17,7
Cherkasy	40	61	+52,5
Chernivtsi	21	18	-14,3
Chernihiv	50	52	+4,0
Total	1 978	1 863	-5,8

The data presented requires some comments.

First, in 2021–2022, there was a general, albeit slight, decrease in the number of road accidents with fatalities and/or injuries (-5.8%).

Second, there are uneven and even opposing trends in different regions of Ukraine. There is a clear correlation between the fighting on the territory of the respective regions of Ukraine and artificial improvements in road safety. A striking example is the Kherson and Donetsk regions, where the number of road accidents resulting in fatalities and/or injuries decreased the most in 2022: by 88.4% and 68.3% respectively. In other words, the more intense the fighting and the larger the area occupied by a given region, the lower the road accident indicators.

Third, in some central and most western regions of Ukraine, where there is no direct military confrontation with Russia, there are opposite trends. According to the International Organisation for Migration, there were 6.9 million internally displaced people in Ukraine at the end of August (Displacement in Ukraine Again on the Rise, IOM Data Shows). The majority have sought refuge in the western and central regions of Ukraine. It is therefore quite logical to see an increase in the number of road accidents in the regions of Cherkasy (+52.5%), Ivano-Frankivsk (+23%), Khmelnytskyi (+17.7%), Ternopil (+15.7%), Lviv (+14.4%) and Vinnytsia (+14%).

Fourth, the main social factor that should be used to assess wartime road safety and compare it with the pre-war period is population migration. By the way, in order to ensure national security and defence, the State Statistics Committee of Ukraine does not disclose data on the population of Ukraine after 1 February 2022 (Population of Ukraine).

The complexity of determining the population of Ukraine is also explained by the dynamic nature of the external migration process. According to the UN Refugee Agency, over 11.1 million Ukrainians (almost one third of the total population of Ukraine) have moved to other countries, mainly to EU countries (Poland – 1.5 million people, Germany – about 1 million people, Czech Republic – 450 thousand people, Italy – 170 thousand people, Spain – 150 thousand people, and others). UN experts consider the departure of millions of Ukrainians beyond their country's borders to be the largest forced migration since the Second World War (Vierlinger, 2022). Despite the return of some Ukrainian citizens to Ukraine in the second half of 2022 and in 2023, the number remains significant at 6.2 million as of November 2023 (Ukraine Refugee Situation).

Taking into account the above, it can be stated that the population of Ukraine decreased significantly in 2022–2023. As a reminder, the reduction in the number of road accidents with fatalities and/or injuries in 2022 was only 5.8%.

In addition, formulating appropriate judgements about the state of road safety in Ukraine during the war is necessary in view of such important factors as:

- Reduction in traffic intensity. This is due to a reduction in the number of vehicles due to millions of Ukrainians travelling abroad in their own cars, the occupation of part of Ukraine, the destruction or damage to vehicles as a result of hostilities, and fuel shortages in Ukraine, especially in March-July 2022, along with a significant increase in fuel prices;
- mobilisation of citizens into the Armed Forces. Hundreds of thousands of citizens, mostly men, were mobilised into the Armed Forces of Ukraine. The exact number is not available as it is a state secret in wartime. Some of these individuals were motorists and/or had previously been active in road traffic, further complicating the road safety situation.

Therefore, it is not possible to claim real stabilisation, let alone significant progress in road safety in Ukraine in 2022. Moreover, one should agree with the researchers' opinion that the analysis of the state of transport security in Ukraine in wartime, especially in the frontline regions, should take into account different phases of its dynamics. These phases include: 1) Acute Phase (characterised by the uncertainty and unregulated nature of road traffic due to active fighting); 2) "Adaptive" Phase (adapting to the defence needs of the community); 3) Partial Recovery and Reconstruction Phase (involving the restoration and reconstruction of road infrastructure and the normalisation of road safety conditions); 4) Stabilisation and Full Recovery Phase (achieving stability and full restoration of road infrastructure) (Kalinina, 2022). These phases depend on the intensity of the fighting and the extent of its consequences. The last phase is generally not well defined, as the full restoration of the road transport system will only take place after the end of the Russia's aggression. It emphasises that the road safety situation is closely linked to the wider context of wartime dynamics, including ongoing military activities and their aftermath.

The analysis of information from the Patrol Police Department on the number of road accidents in Ukraine involving fatalities and/or injuries on national highways in 2021–2022 is of scientific interest. Despite a 19.3% decrease in this indicator (from 4,073 incidents in 2021 to 3,285 in 2022), there is a significant increase in certain sections of these national highways in Ukraine, including P-38 (+250%); N-32 (+180%); P-31 – M-30 (+140%); P-04 (+71.4%); M-15 (+59.5%); P-46 (+57.1%); M-30 (+36%); H-15 (+35.7%); M-13 (+33.3%); M-11 (+21.1%) and others (Statistics of road accidents in Ukraine for 2021–2022).

The significant increase in road fatalities and injuries on these and many other highways of national

importance was due to the intensification of road traffic associated with the evacuation of Ukrainian citizens from the frontline regions to the central and western regions of the country, as well as to Poland, Romania and Moldova.

The decrease in the number of road traffic accidents in Ukraine in 2022 resulting in fatalities and/or injuries coincides with the implementation of a curfew between 11 PM and 6 AM, which was introduced in connection with the state of war. During the curfew, the operation of vehicles and the free movement of citizens on the streets of populated areas is prohibited.

3. Circumstances Affecting Road Safety in Ukraine During the War

The negative state of road safety in Ukraine during the state of war is influenced by such factors as the installation of special, including anti-tank, barriers, concrete blocks and other fortifications on roads designed to restrict or prevent the movement of large enemy military vehicles. Such objects not only impede the unhindered passage of civilian vehicles and public transport, but also create additional significant risks of collision with such structures.

In addition, the operation of thousands of checkpoints on Ukrainian roads was organised to check the documents of drivers and passengers of vehicles, to prevent the entry of Russian sabotage and reconnaissance groups into Ukrainian-controlled territory, and to inspect vehicles to prevent the illegal transport of firearms and explosives. According to the Ministry of Internal Affairs of Ukraine, during the 18 months of war, 11 military and National Police officers lost their lives and 37 people were injured in road accidents at checkpoints (Road accidents at checkpoints: how many soldiers have died since February 2022). Although these figures are not critical, they contribute to the growing concern about road safety in Ukraine:

- Switching off street lighting. Street lights were switched off in the evening and at night to provide light camouflage. This is a necessary measure to prevent Russian aviation from attacking both military and civilian infrastructure in Ukraine;
- damage caused by the hostilities. In particular, in the eastern and southeastern regions of the country, the road transport infrastructure, including road surfaces, road signs, signposts and markings, traffic lights, road fences, etc., has been damaged as a result of the hostilities. All of these elements are crucial not only for comfortable travelling on the roads, but also for ensuring road safety;

- large-scale destruction or removal of information signs. This includes signs with the names of settlements, directional signs to specific administrative units, which are intended to disorganise Russian troops in unfamiliar territory, hinder their movement and significantly reduce the morale of Russian soldiers;
- active involvement of patrol police in non-specific activities. The Patrol Police are actively involved in activities that go beyond their typical security and defence responsibilities. In addition, many police officers have volunteered to defend Ukraine.

An additional challenge for the Kherson region police was the ecocide committed by Russia, which in 2023 blew up the Kakhovka Dam. The police rescued thousands of Ukrainians who were in the flood zone. The reduction in the number of police officers responsible for road safety has had a negative impact on both road accidents and road traffic deaths and injuries.

In the first months of the war, police documentation of road accidents in frontline settlements was paralysed, making it difficult to bring those responsible for them to justice. Therefore, the documentation process was carried out in a self-regulatory mode, when drivers either filled out the Europrotocol¹ in the event of an accident or decided on their own to compensate for the damage caused.

The method of participant observation is of particular importance in criminological research. This method is considered a form of field research and involves studying social phenomena without directly interfering in their course (Horodianenko, 2008). Therefore, the personal experience of researchers who have directly witnessed the impact of the war on road safety in Ukraine is invaluable. In particular, the criminologist V. S. Batyrgareieva shares her personal impressions of life in the frontline city of Kharkiv in the spring of 2022 and highlights the factors that negatively affected the state of road safety: suspension and disruption of public transport; movement of military vehicles on city roads; disconnection of the automatic traffic violation detection system (to prevent the enemy from using video information to assess the quantitative composition of the Ukrainian Armed Forces and their movement directions); presence of foreign objects on the roads after the explosion of artillery shells and rocket artillery systems; Deliberate violation of speed limits by drivers trying to avoid areas affected by enemy shelling; increase in the number of car accidents in the city after the return of residents who were accustomed to low-intensity traffic and ignored certain traffic safety requirements due to the physical absence of patrol police and the

¹ Note: The Europrotocol is a paper or electronic form used in Ukraine for drivers to independently document a road accident. It allows individuals to report a road accident without the need to involve law enforcement officials (European Protocol for Road Accidents: What it is and how to use it).

gradual formation of a sense of impunity, and more (Batyrgareieva, 2022).

Here's another example of a participant's scientific observation of the road situation during 18 hours of being stuck in an 83 km traffic jam outside a major city under wartime conditions. On roads of national importance, during the evacuation of millions of Ukrainians, numerous accidents occurred due to heavy traffic. These accidents were accompanied by cars driving into oncoming lanes, other situations creating emergency conditions, fuel shortages, clashes between drivers, deliberate damage to other vehicles against the background of unfriendly relations between road users, anti-social behaviour (insults, verbal abuse, humiliation) and more (Kolodyazhny, 2022). Such mass incidents, which occurred in the spring of 2022, were generally not documented by the police and were not taken into account when assessing the state of road safety.

Personal experience from participant observation of road safety conditions provided the basis for the development of guidelines by experts from the Academician Stashis Scientific Research Institute for the Study of Crime Problems of the National Academy of Law Sciences of Ukraine. These guidelines, entitled "Rules of Behaviour of Road Users during War", are addressed to the National Police, the military-civilian administrations of Ukraine and local self-government bodies. The aim is to provide citizens who read them with the knowledge to ensure their safety, health and vehicles in conditions of Russian aggression.

4. Characteristic Features of Road Safety Conditions in Wartime

The criminological analysis of the state of road safety in Ukraine during the war and the circumstances that negatively affected and continue to affect it to this day gives grounds to identify a number of specific features. These features reflect the peculiarities of road safety in wartime. They include the following:

- Unpredictability and instability of road safety, especially in the frontline regions of Ukraine and in areas where active hostilities are taking place;
- inadmissibility of extrapolating the state of road safety from the pre-war period (2020–2021) to the wartime period due to the radical transformation of social conditions in Ukraine from February 24, 2022;
- complexity of forecasting the state of road safety in wartime in general;
- decrease in the number of road users and vehicles due to: evacuation of the population by cars abroad; destruction or damage to vehicles as a result of hostilities; destruction of transport infrastructure;

higher fuel prices; reduction in the length of roads due to the occupation of part of Ukraine's territory, etc.;

- changes in the legal regulation of road traffic as a result of the adoption of new regulations during the war, including amendments to the existing legislation governing road traffic;
- weakened coordination between road safety actors, including information exchange (patrol police, road services, medical personnel, the State Emergency Service of Ukraine, specialised NGOs, etc.);
- limited resource and staffing capacity of the patrol police and, as a result, a decrease in its effectiveness in preventing offences in this area;
- impossibility or difficulty of providing emergency medical care to victims of road accidents and citizens travelling on dangerous roads in the context of armed conflict;
- inapplicability of measures to prevent road safety offences, which are usually effective in peacetime, due to their lack of effectiveness in wartime, etc.

5. Economic Losses of the Road Transport Sector and Human Capital during the War

Scientific literature rightly points out that the phenomenon of road traffic accidents should be analysed not only retrospectively, but also taking into account the huge socio-economic damage caused to society by the premature mortality of working people who died or became disabled as a result of an accident (Batyrgareieva, Shramko, Samoilo, 2021, p. 2872). As is well known, one of the methods of calculating the loss of human resources is the universal system of calculating the loss of social and state income in the form of gross domestic product (GDP) for the years of potential life lost due to premature death.

According to our preliminary calculations, in monetary terms, the losses from the unrealised lives of those who died in road accidents in just one year amount to over 300 million USD (Batyrgareieva, Shramko, Samoilo, 2021, p. 2875). This is the amount by which the income of the state and society in the form of GDP decreases annually due to the premature death of Ukrainian citizens.

In the conditions of war, in addition to the material losses caused by the death of people in "traditional" road accidents, the losses resulting from the death and injury of people due to enemy shelling on highways (for example, during evacuation by road from combat zones or during presence in occupied territories) should also be taken into account. Unfortunately, Ukraine does not currently have complete information in this regard. Therefore, it is impossible to make precise calculations that would accurately reflect the situation.

According to preliminary estimates by the State Agency for Reconstruction and Development of Infrastructure of Ukraine, Russia has destroyed 25.1 thousand kilometres of roads and 344 bridges and overpasses of national, local or municipal importance (Report on direct damage to infrastructure from destruction as a result of Russia's military aggression against Ukraine one year after the start of the full-scale invasion, p. 17). Reconstruction of this infrastructure is estimated to cost 970 billion UAH (Orel, 2022) (about 25.7 billion EUR) and will require four years of painstaking work by thousands of construction workers.

The total damage to public transport (trolleybuses, trams, buses) caused by enemy attacks with heavy weapons amounted to 25 billion UAH or 0.9 billion USD (Draft Recovery Plan for Ukraine. Materials of the working group "Audit of losses incurred as a result of the war", p. 46, 52). In turn, the direct losses to private passenger vehicles amount to about 1.86 billion USD, or 207,000 cars. In addition, 1,929 fire engines were lost for a total of 89 million USD (Report on direct damage to infrastructure from destruction as a result of Russia's military aggression against Ukraine one year after the start of the full-scale invasion, p. 21), excluding losses of other specialised equipment and freight vehicles (Draft Recovery Plan for Ukraine. Materials of the working group "Audit of losses incurred as a result of the war", p. 52). Public transport sustained the most significant damage in Luhansk and Donetsk oblasts and in the city of Kharkiv.

Thus, in order to increase the effectiveness of the state policy of Ukraine in the field of road safety, expressed in a significant reduction of the number of deaths and injuries of road users, and thus in a reduction of the losses caused by these incidents, it is necessary to take into account new challenges and threats, including those of a military nature, in the development of a new pro-European strategy for ensuring road safety and transport operations in Ukraine. Therefore, the prospective directions of activity of many stakeholders in solving urgent problems in the road transport sector and in the legal field of Ukraine, relevant until 2022, need to be supplemented by a number of other tasks influenced by the war and its negative consequences.

6. Conclusions

The criminological study of the impact of the war on road safety in Ukraine gives rise to the following conclusions:

1. The war has had a significant impact on the transformation of Ukraine's entire social system, including the road safety and transport sector. Russia's

aggression and its negative consequences have become a real threat to Ukrainian citizens, in particular in terms of the level of violations in the field of road safety and the prevention of deaths and injuries in road transport.

2. The reduction in road safety violations, as well as deaths and injuries on Ukrainian roads in 2022, is offset by a number of negative socio-political, socio-economic, organisational, managerial and demographic circumstances. Therefore, the actual state of road safety during the war, at a minimum, has not changed compared to the pre-war period, and at most, it has deteriorated, especially given the fact that millions of citizens have left Ukraine.

3. The impact of the war on road safety is multidimensional, influenced, among other things, by the displacement of regions in Ukraine and the intensity of hostilities in certain areas.

4. The consequences of the Russian aggression have caused colossal damage; they have changed the geography of traffic violations, reducing them in the eastern and south-eastern frontline regions of Ukraine, while significantly increasing them in the western and central regions of Ukraine. The artificial "shifting" of the concentration of road accidents with fatalities and injuries occurred due to the intensification of such incidents on evacuation routes for the peaceful population of Ukraine. The aggression has also influenced the structure of road accidents with fatalities and/or injuries and has complicated the work of the patrol police, which, due to the tasks of ensuring security and defence, has difficulties in effectively preventing violations in this sphere.

5. Among the most significant factors negatively affecting the state of road safety in Ukraine during the war are the destruction of road infrastructure, especially in the frontline regions, the objective reduction of the effectiveness of the patrol police, the creation of a sense of impunity among road users, the construction of fortifications and the organisation of checkpoints and control points on the roads, the switching off of street lighting during the evening and night hours, etc. These factors have had a negative impact on the state of road safety in Ukraine during the war.

6. Characteristic features of the road safety system in Ukraine during the war include the complexity of objective assessment of the state of this sphere; its unpredictability and instability; the inadmissibility of extrapolating the state of road safety from the pre-war period to the war period; the difficulty of predicting the state of road safety during wartime; the reduction in the number of road users and vehicles; the imbalance in the interaction between various entities in the road safety sector; the

complexity of providing emergency medical assistance to the victims of road accidents; and the mismatch of tasks in preventing violations in peacetime and wartime.

7. Along with material losses from deaths in "traditional" road accidents in wartime, it is necessary to take into account losses from deaths and injuries as a result of enemy shelling while on the roads.

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