

Forensic Road Technical Examination: State and Changes in Accordance with New Tasks of Expert Support of Justice

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The purpose of this article is to establish a scientific foundation for the significance of studying the formation and expansion of the subject matter in expert road technical research. This is aimed at enhancing the efficiency of specific expertise utilization in investigating criminal offenses related to the construction and repair of roads. Additionally, it focuses on determining damages resulting from the destruction of road infrastructure due to hostilities and other negative factors affecting the state of road infrastructure. The methodological basis of the study is grounded in the principles of the theory of cognition, enabling an exploration of the essence of the subject matter of road technical research. It involves the identification of factual data and circumstances related to criminal proceedings (formulating the concept of the subject matter of road technical examination depending on the tasks to be addressed) and the determination of objects, subjects, and research methods. A set of methods of scientific cognition is applied, including general scientific, individual, and special methodologies. The author outlines and scientifically substantiates the directions for forming the subject areas of forensic road technical examination. Based on the analysis of statistical data from expert practice, the author demonstrates an increase in both the number and complexity of road technical examinations performed. The genesis of changes in the boundaries of the subject matter of forensic

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road and technical research is clarified. Attention is focused on the close connection of the subject of forensic research with the tasks to be solved in connection with qualitative changes in crime and the challenges of war. The author proves the need for the development and implementation of the latest forensic research methods for use by an authorized person in the investigation of criminal offenses in the field of road infrastructure. The factors influencing the results of expert research are outlined. The author formulates proposals aimed at the more efficient use of specific expertise to ensure the detection and investigation of crimes, as well as to improve the results of the work of forensic experts. This is discussed in the context of developing a scientific and methodological framework for enhancing the primary form of application of specific expertise - forensic examination.

Keywords: *specific expertise, expert, knowledgeable person, forensic methodology, expert opinion, pre-trial investigation, statistical data, forensic road technical examination, road infrastructure.*

Research Problem Formulation

One of the ways to increase the efficiency of forensic activities is the timely and purposeful use of modern capabilities of specific expertise through the involvement of knowledgeable people and the use of the latest material and technical tools. The detection and investigation of criminal offenses in the field of road infrastructure largely depend on the involvement of knowledgeable people in the form of forensic examination to research and use evidence in criminal proceedings. Changes in the vectors of urgent tasks faced by forensic experts during the full-scale invasion of Ukraine by the Russian Federation give rise to the need for their urgent solution. If, before the war, the determinants of the illegal use of budget funds in the road sector were most often attributed to

deficiencies in state policy, delayed decentralization management reforms, outdated and ineffective measures of financial control over the legality of budgetary funds usage, etc.¹, then at the present stage, new challenges face forensic experts — to determine the extent of damage caused by the destruction of road infrastructure due to artillery shelling, aviation bombings, and missile strikes on objects of Ukraine's road infrastructure. These circumstances motivate researchers to develop new theoretical and methodological provisions in this area of forensic expert activity based on the analysis of expert practice and encourage further discussion on the problems of application of specific expertise in criminal proceedings in general and during the investigation and trial of crimes in the field of road infrastructure in particular.

1 Іжевський Р. П. Основні детермінанти незаконного використання бюджетних коштів у сфері будівництва автомобільних доріг. *Актуальні проблеми держави і права*. 2019. Вип. 83. С. 44—50. URL: <https://hdl.handle.net/11300/13111> (дата звернення: 10.12.2023).

Analysis of Recent Research and Publications

The use of specific expertise in the investigation of crimes has received considerable attention, in particular, in the scientific works of Ukrainian researchers:

L. Yu. Arotsker ², V. P. Bakhin ³, V. S. Bondar ⁴, V. H. Honcharenko ⁵, V. A. Zhurav ⁶, N. I. Klymenko ⁷, V. P. Kolmakova ⁸, V. O. Konovalova ⁹, V. K. Lysychenko ¹⁰, H. M. Nadjorny ¹¹, H. V. Prokhorova-Lukina ¹², M. V. Saltevs'kyi ¹³, M. Ya. Sehai ¹⁴, E. V. Simakova-Yefremian ¹⁵, Z. M. Sokolovskiy ¹⁶, I. Ya. Fridman ¹⁷,

- 2 Ароцкер Л. Е. Об этике судебного эксперта. *Криминалистика и судебная экспертиза*. 1968. Вып. 5. С. 135—141.
- 3 Бахин В. П. Криминалистика. Проблемы и мнения (1962—2002). Киев, 2002. 268 с. URL: <http://dot.kostacademy.kz/bible/files/995025634.pdf> (дата звернення: 10.12.2023).
- 4 Бондар В. С. Вирішення техніко-криміналістичних завдань досудового розслідування кримінальних правопорушень як засіб оптимізації інформаційного забезпечення судової експертизи. *Право і суспільство*. 2021. № 2. С. 178—190. DOI: 10.32842/2078-3736/2021.2.26 (дата звернення: 10.12.2023).
- 5 Гончаренко В. Г. Методологічні проблеми вчення про предмет криміналістики. *Актуальні проблеми криміналістики* : мат-ли міжнар. наук.-практ. конф. (Харків, 25—26.09.2003). Харків, 2003. С. 11—13.
- 6 Журавель В. А. Вибрані твори. Харків, 2016. 704 с.
- 7 Клименко Н. И. Судовая экспертология: курс лекций : навч. посіб. для студент. юрид. спец. вищ. навч. закл. Київ, 2007. 528 с.
- 8 Вариеш Г. В., Колмаков В. П. О разработке новых методов, приемов и средств криминалистики в ГДР. *Криминалистика и судебная экспертиза*. 1971. Вып. 8. С. 369—379.
- 9 Коновалова В. Е. О значении и функциях экспертных версий. *Криминалистика и судебная экспертиза*. 1977. Вып. 14. С. 53—58.
- 10 Лисиченко В. К. К вопросу о предмете и системе криминалистической экспертизы / Материалы 4-й расширенной научной конференции. Киев, 1959. С. 328—331.
- 11 Надгорный Г. М. Предмет судебно-экспертной отрасли знаний и предмет судебной экспертизы. *Криминалистика и судебная экспертиза*. 1976. Вып. 13. С. 37—42.
- 12 Прохоров-Лукин Г. В. Предмет судебной экспертизы и общие основания деления экспертных задач на категории. *Там же*. 2001. Вып. 50. С. 3—15.
- 13 Салтевський М. В. Криміналістика : підручник. У 2 ч. Ч. 1. Харків, 1999. 416 с.
- 14 Сегай М. Я. Методология судебной идентификации. Киев, 1970. 256 с.
- 15 Див., напр.: Сімакова-Єфремян Е. Б. Деякі проблеми та шляхи вдосконалення правового регулювання судово-експертної діяльності. *Держава і право. Юридичні і політичні науки*. 2001. Вип. 11. С. 447—451 ; Її ж. До питання про методи та методики експертних досліджень. *Сучасні проблеми розвитку судової експертизи* : зб. мат-лів засід. «кругл. столу», присвяч. 10-річ. створ. Севастоп. від. ХНДІСЕ ім. Засл. проф. М. С. Бокаріуса (Севастополь, 10—11.06.2010). Харків, 2010. С. 31—33 ; Її ж. Проблеми методичного забезпечення комплексних експертних досліджень. *Теорія та практика судової експертизи і криміналістики*. 2013. Вип. 13. С. 225—232.
- 16 Соколовский З. М. Проблема использования в уголовном судопроизводстве специальных знаний для установления причинной связи явлений : дис. ... д-ра юрид. наук. Харьков, 1963. 518 с.
- 17 Фридман И. Я. Использование данных судебной экспертизы для предупреждения правонарушений. Киев, 1972. 168 с.

V. Yu. Shepitko ¹⁸, M. V. Shepitko ¹⁹, M. H. Shcherbakovskiy ²⁰ and others. The above-mentioned scientists and practitioners have pointed out the problematic aspects of defining the concept of specific expertise, the nature, structure, purposes, forms of its use in court proceedings, the principles of forensic expert activity, the legal regulation of the use of specific expertise, skills and abilities in criminal proceedings, the shortcomings of the legal regulation of the use of specific expertise; the problem of defining the general concept and functional purpose of experts in court proceedings for solving technical and forensic tasks of pre-trial investigation of a crime.

However, there is a lack of thorough research on improving the efficiency of the use of specific expertise in the investigation of criminal offenses related to the repair and construction of road infrastructure and road construction, as well as, what is now urgent, the determination of damages from the actions of the Russian aggressor as a result of the destruction of road infrastructure facilities, which determines the relevance of the chosen topic of this research paper, guiding our further research.

Article Purpose

To develop and scientifically substantiate the areas of road technical research using specific expertise in the investigation of criminal offenses in the field of road infrastructure, and to formulate relevant proposals.

Research Objectives

In order to achieve this goal, it is necessary to perform the following tasks:

- to analyze the practice of conducting forensic road technical examinations, and based on this to find out the genesis of changes in the forms and methods of using specific expertise in the course of road technical research;
- to outline the factors that influence the results of expert research and to identify areas for improving the effectiveness of the use of specific expertise in the investigation of criminal offenses of road infrastructure;
- to formulate proposals aimed at more effective use of specific expertise in ensuring the detection

18 Шепітько В. Ю. Тенденції і перспективи розвитку криміналістики (концептуальність підходів і дискусійність поглядів). *Актуальні проблеми криміналістики* : мат-ли міжнар. наук.-практ. конф. (Харків, 25–26.09.2003). Харків, 2003. С. 5–8. URL: <https://dspace.nlu.edu.ua/jspui/handle/123456789/13888> (дата звернення: 10.12.2023) ; Шепітько В. Ю., Журавель В. А., Авдеева Г. К. Інновації в криміналістиці та їх впровадження в діяльність органів досудового слідства. *Питання боротьби зі злочинністю*. 2011. Вип. 21. С. 39–45. URL: <https://dspace.nlu.edu.ua/jspui/handle/123456789/5481> (дата звернення: 10.12.2023) ; Шепітько В. Ю. Проблеми використання спеціальних знань крізь призму сучасного кримінального судочинства в Україні. *Судова експертиза*. 2014. № 1. С. 11–18.

19 Шепітько М. В. Засоби протидії наданню судовим експертом завідомо неправдивого висновку. *Теорія та практика судової експертизи і криміналістики*. 2015. Вип. 15. С. 180–188. URL: http://nbuv.gov.ua/UJRN/Тпsek_2015_15_25 (дата звернення: 10.12.2023).

20 Щербаківський М. Г. Проведення та використання судових експертиз у кримінальному провадженні : монографія. Харків, 2015. 560 с.

and investigation of crimes and improving the results of work in forensic science.

Research Methods

To achieve this goal, general, individual and special methods of forensic examination are used. Much attention is given to the methods of statistical analysis, generalization of the data obtained (synthesis) and justification of the need to develop a special method — a methodology for solving the problems of road technical examination.

Main Content Presentation

The processes of changes in the forms and methods of application of specific expertise, particularly, during forensic examinations, indicate that the subject matter of forensic research depends primarily on the tasks that forensic experts face today. In this regard, let's consider the practice of appointing forensic road technical examinations in the system of forensic institutions of the Ministry of Justice of Ukraine. The results of the analysis of statistical data are presented in the following table.

Information on conducting forensic road technical examinations
for 2015–2022

Table

Year	Completed examinations and expert research											Pending resolution						Returned materials without research		
	Total for the past year	Total for the current year	As % of the previous year	On request by								Total issues	Unresolved due to a lack of							
				courts	MIA, National Police	Prosecutors' Offices	Security Service of Ukraine	Fiscal authorities	State Bureau of Investigation	other organizations, notaries	citizens, lawyers		Over a period of more than 90 days	methods	specialists, equipment	incompleteness or unsuitability of research objects	other reasons		categorical conclusions	
2015	16	36	125,0	2	33						1	14	182	2		10		162	19	
2016	36	38	5,6	2	24	7					1	4	5	116	2	5	29		55	20
2017	38	61	60,5	9	26	8		4			14		16	399	4	18	108	23	246	27
2018	61	89	45,9	9	28	51						1	35	176		5	5	15	151	35
2019	89	102	14,6	41	15	42						4	37	500					429	21
2020	102	168	64,7	72	80	7	6					3	58	669		99		29	540	91
2021	168	246	46,4	201	33				3			9	16	701	25		8	36	622	64
2022	246	188	-23,6	7	173					8			55	524	16		4	45	459	28
In total	756	928	22,8	343	412	115	6	4	3	23	22	236	3267	49	127	164	148	2664	305	

The table shows an increase in the number of forensic technical road examinations: from 36 in 2015 to 188 in 2022. It should be noted that in 2022 a full-scale invasion of Ukraine began, so a certain decrease in the number of road technical examinations in comparison with the previous year (2021) (246 examinations) is explained by this factor. However, it should be noted that according to the Ministry of Justice of Ukraine,

an increase in the number of forensic examinations in 2023 compared to the previous year occurred in road technical research — by 170.3 %. Thus, this indicates the relevance of the development of this area of road engineering research. Let's illustrate these indicators with the corresponding graphs, which clearly show the growth by customer: courts, law enforcement, and other customers (*see Figure 1*).

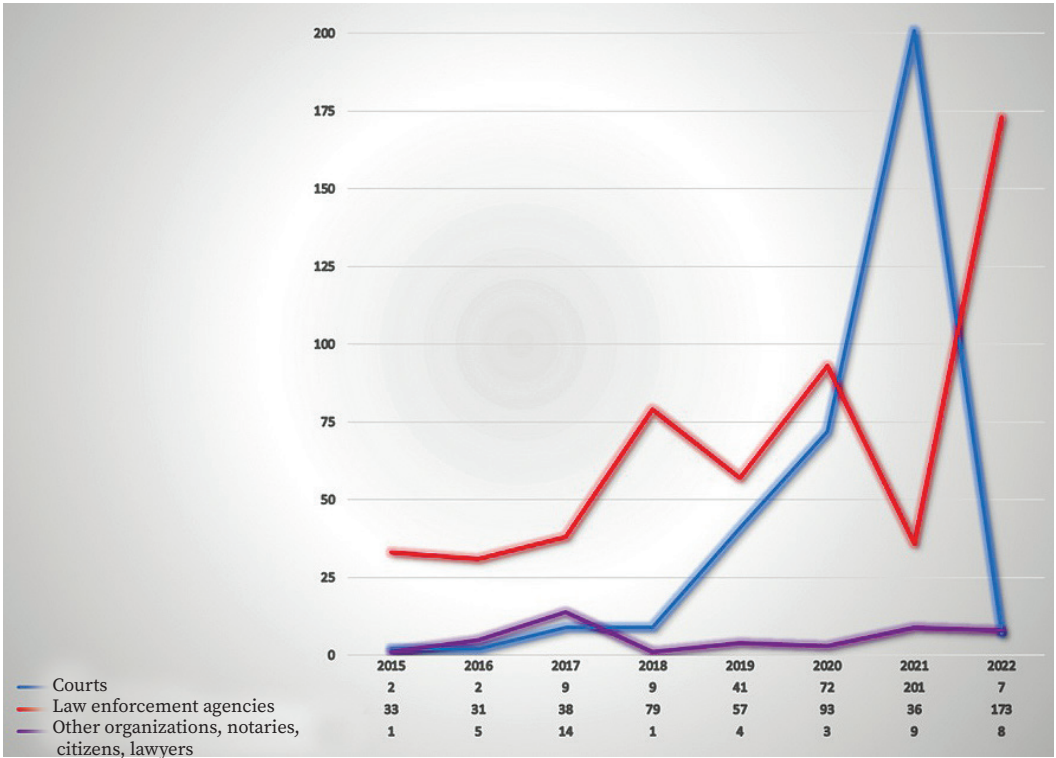


Fig. 1. The number of completed forensic examinations and expert research commissioned by courts, law enforcement agencies, and other organizations from 2015 to 2022

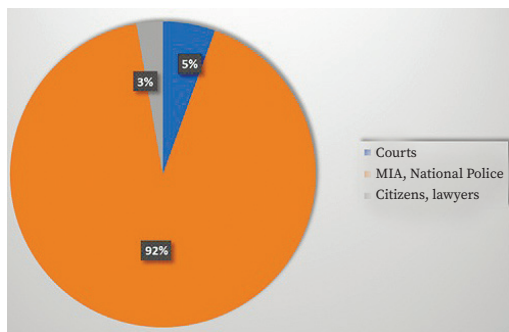


Fig. 2. Completed examinations and expert research in 2015 on request by

The diagram (see Fig. 2) shows that in 2015, 92 % of the following were completed: for the National Police (33 forensic examinations), 5 % for courts (2 forensic examinations), and 3 % for other customers (1 forensic examination). Compared to the previous year, the increase is 125 %.

The analysis of statistics for the year 2016 is shown in Fig. 3.

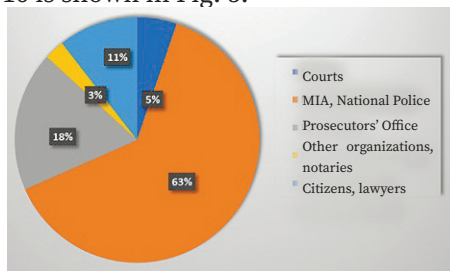


Fig. 3. Completed examinations and expert research in 2016 on request by

According to the analysis, the largest number of road technical examinations was conducted for the Ministry of Internal Affairs and the National Police — 63 % (24 examinations); 18 % (7 examinations) — for the Prosecutor's Office; 11 % (4 examinations) — for citizens, lawyers; 5 % (2 examinations) — for courts; 3 % (1 examination) — for notaries and other customers. Compared to 2015, the increase

was 5.6 %. The composition of customers has changed: forensic examinations commissioned by the Prosecutor's Office, citizens and lawyers have appeared.

See Fig. 4 for the statistical analysis for the year 2017.

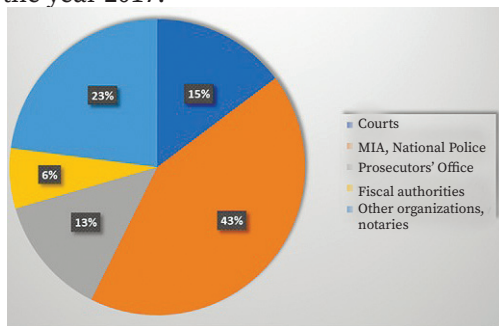


Fig. 4. Completed examinations and expert research in 2017 on request by

As can be seen from the diagram, the Ministry of Internal Affairs and the National Police are the leaders in terms of the number of examinations ordered — 43 % (26 examinations), the number of studies ordered by other organizations and notaries has increased — 23 % (14 examinations); the percentage of examinations ordered by courts has also increased — 15 % (9 examinations), prosecutors — 13 % (8 examinations), and fiscal authorities — 6 % (4 examinations). In total, the number of examinations performed increased by 60.5 %.

See Fig. 5 for the statistical analysis for the year 2018.

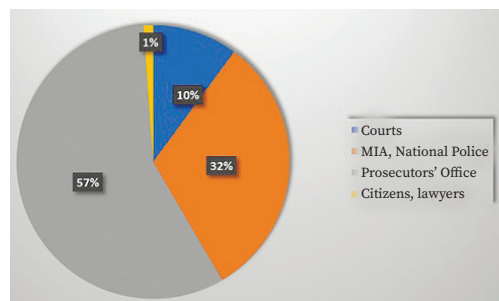


Fig. 5. Completed examinations and expert research in 2018 on request by

In 2018, there was a sharp increase in forensic road technical examinations ordered by prosecutors — 57 % (51 examinations); a significant number were also ordered by the Ministry of Internal Affairs and the National Police — 32 % (28 examinations) and courts — 10 % (9 examinations). In general, in 2018, the number of forensic road technical examinations increased by 45.9 %.

See Fig. 6 for the statistical analysis for the year 2019.

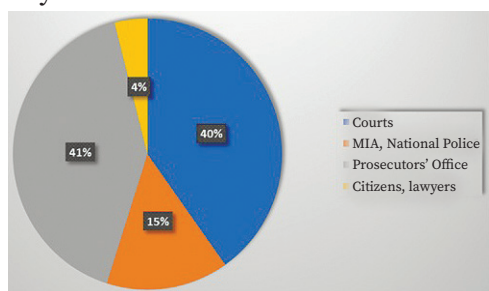


Fig. 6. Completed examinations and expert research in 2019 on request by

In 2019, the percentage of forensic examinations appointed by prosecutors and courts was almost the same — 41 % (42 examinations) and 40 % (41 examinations), respectively; 15 % (15 examinations) were appointed by the police and 4 % by citizens (lawyers). In total, in 2019, the number of forensic road technical examinations increased by 14.6 % (102 examinations were conducted).

See Fig. 7 for the statistical analysis for the year 2020.

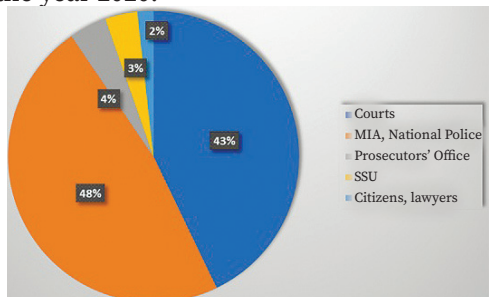


Fig. 7. Completed examinations and expert research in 2020 on request by

In 2020, the MIA (National Police) was again the leader in the appointment of road technical examinations — 48 % (80 examinations); 43 % — courts (72 examinations); significantly fewer examinations were conducted on request by the Prosecutor's Office, the Security Service of Ukraine, and citizens or lawyers — 4 %, 3 %, and 2 %, respectively. The total number of road technical examinations increased by 64.7 % (168 examinations).

See Fig. 8 for the statistical analysis for the year 2021.

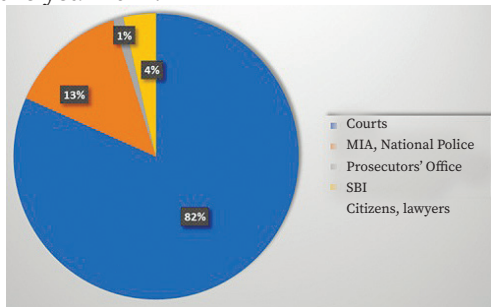


Fig. 8. Completed examinations and expert research in 2021 on request by

In 2021, the courts received the largest number of results of road technical examinations (82 % of the total number of examinations conducted, which amounted to 201 examinations); 13 % of the total number were conducted by the Ministry of Internal Affairs and the National Police (33 examinations); 4 % of examinations were conducted for citizens (lawyers) — 9 examinations and 1 % — for the State Bureau of Investigation (3 examinations). The total number of forensic road technical examinations increased by 46.4 % and amounted to 246 examinations — the largest number for the entire period of existence of this type of examination.

The year 2022 was marked by changes in priorities in forensic research. Fig. 9 summarizes the quantitative indicators of forensic road technical examinations conducted in 2022.

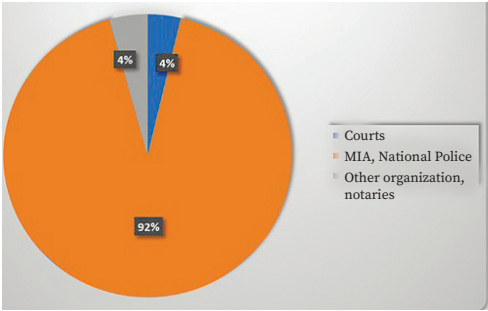


Fig. 9. Completed examinations and expert research in 2022 on request by

The diagram shows that the largest number of road technical examinations were conducted for the Ministry of Internal Affairs and the National Police, accounting for 92 % (173 examinations). Forensic road technical examinations conducted for courts and other organizations each account for 4%. The decrease in the number of examinations conducted by 23%, as we have already noted – is due to the Russian aggression against Ukraine, which prevented many forensic institutions from operating as usual. At the same time, 188 forensic road technical examinations were conducted, and information from the Ministry of Justice indicates a significant increase in 2023.

Of interest to our scientific research is the analysis of the reasons for returning materials without conducting examinations. Figure 10 presents a diagram that reflects the number of materials returned without being examined.

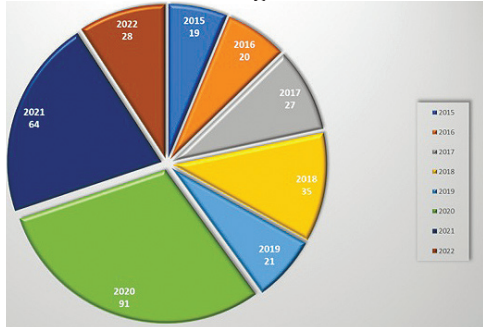


Fig. 10. Returned materials without being examined from 2015 to 2023

The diagram illustrates that, in 2015, 19 materials were returned without examination. In 2016, the number increased to 20, followed by 27 in 2017, 35 in 2018, 21 in 2019, and a significant peak of 91 in 2020 – the highest recorded. In 2021, the count decreased to 64, and in 2022, it was 28. The primary reason for returning materials without forensic examination was their inadequacy in addressing the raised issues. This highlights the imperative to formulate scientific and methodological recommendations for preparing materials for the forensic road technical examination process.

Let's continue the analysis of statistical data on issues related to forensic road technical examination. It concerns the number of questions posed to forensic experts during the period from 2015 to 2022, as presented in Figure 11.

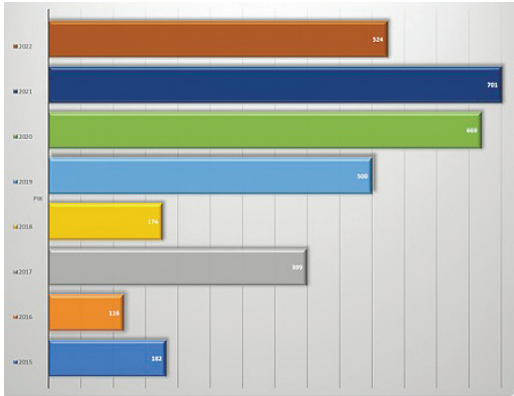


Fig. 11. Number of questions posed to experts from 2015 to 2022

The indicators provided in the diagram indicate a consistent trend of continuous growth in the number of questions posed for resolution by forensic experts in the field of road-technical examination. Specifically, in 2015, there were 182 questions, in 2016 – 116, in 2017 – 399, in 2018 – 176, in 2019 – 500, in 2020 – 659, in 2021 – 701, and in 2022 – 504. It is clear that the reduction

in the number of questions posed for resolution in 2022 reflects a decrease in the number of appointed examinations due to the war.

Let us conclude the analysis of the statistical data on the number of issues by their implementation by the form of resolution (see Fig. 12).

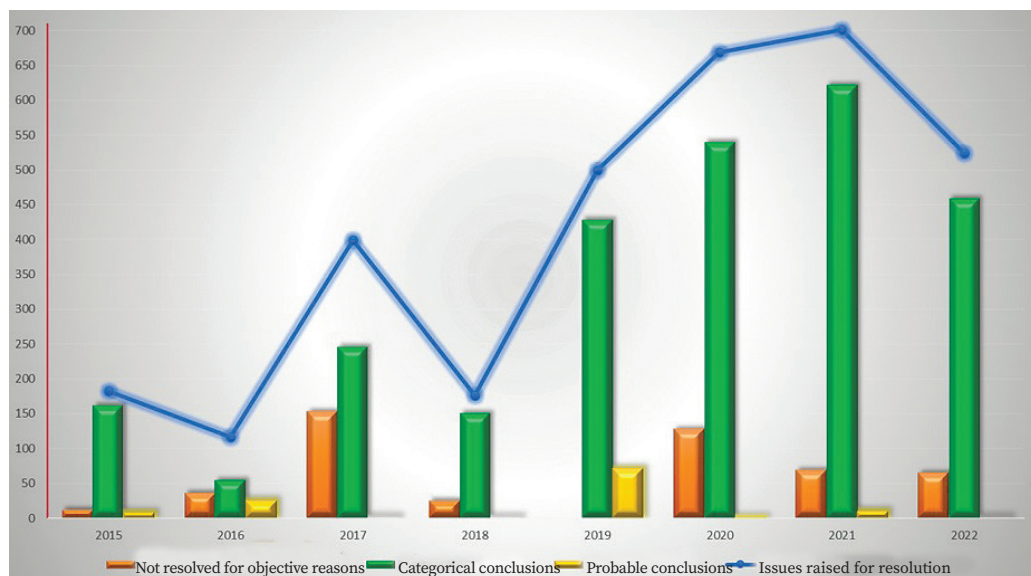


Fig. 12. Number of issues by resolution form from 2015 to 2022

As we can see, regarding the form of solving problems in forensic road technical examination, there is an increase in the number of problems solved in a categorical form. At the same time, there is also a considerable number of unresolved issues due to various factors, among which the need to develop a general methodology for forensic road technical examination is obvious.

Thus, based on the results of statistical analysis, the author outlines and scientifically substantiates the areas for improving the efficiency of the use of specific expertise in the investigation of criminal offenses in the field of road infrastructure.

Conclusions

Based on the above study, the author scientifically substantiates the relevance of

studying the areas of formation and expansion of the subject matter of expert road-technical research to increase the efficiency of the use of specific expertise in the investigation of criminal offenses related to the construction, repair of roads and determining the amount of damage from the destruction of road infrastructure as a result of hostilities and other negative factors affecting the state of road infrastructure. The directions for the formation of the fields of the subject of forensic road-technical expertise are defined and scientifically substantiated. Based on the analysis of statistical data from expert practice, an increase in the quantity and complexity of performed road-technical examinations is demonstrated. The genesis of changes within the subject of forensic road-technical examinations is clarified. Emphasis is placed on the close connection between the subject of forensic expert research and

tasks that require resolution in connection with qualitative changes in criminality and the challenges of war. The need for the development and implementation of the latest forensic research methods is proved. The factors influencing the results of expert research are outlined. The author formulates proposals aimed at more efficient use of specific expertise in ensuring the detection and investigation of crimes and improving the results of work of forensic experts in the context of developing a scientific and methodological framework for improving the main form of application of specific expertise — forensic examination.

Судово-експертне дорожньо-технічне дослідження: стан і зміни відповідно до нових завдань експертного забезпечення правосуддя

Євген Півнюв

Мета статті — науково обґрунтувати актуальність дослідження напрямів формування та розширення предмета експертного дорожньо-технічного дослідження з метою підвищити ефективність використання спеціальних знань у розслідуванні кримінальних правопорушень, пов'язаних із будівництвом, ремонтом доріг і визначенням збитків від руйнування дорожньої інфраструктури внаслідок воєнних дій та інших негативних чинників, що впливають на стан дорожньої інфраструктури. Методологічним підґрунтям дослідження є положення теорії пізнання, що дали змогу дослідити сутність предмета дорожньо-технічних досліджень, виокремити фактичні дані й обставини кримінального провадження (для формулювання поняття предмета дорожньо-технічної експертизи залежно від вирішуваних завдань) і визначити об'єкти, суб'єкти й методи дослідження. Застосовано комплекс методів наукового

пізнання, зокрема: загально-наукових, окремих і спеціальних. Окреслено й науково обґрунтовано напрями формування полів предмета судової дорожньо-технічної експертизи. На підставі аналізу статистичних даних з експертної практики продемонстровано зростання кількості та складності виконаних дорожньо-технічних досліджень. З'ясовано генезис змін меж предмета судових дорожньо-технічних досліджень. Зосереджено увагу на тісному зв'язку предмета судово-експертного дослідження із завданнями, що підлягають розв'язанню у зв'язку із якісними змінами злочинності й викликами війни. Доведено потребу в розробленні та впровадженні новітніх методик судово-експертного дослідження для використання уповноваженою особою під час розслідування кримінальних правопорушень у сфері дорожньої інфраструктури. Окреслено чинники, що позначаються на результатах експертних досліджень. Сформовано пропозиції, спрямовані на більш ефективне використання спеціальних знань у забезпеченні розкриття та розслідування злочинів і поліпшення результатів роботи судових експертів у контексті розроблення науково-методичної бази для вдосконалення основної форми застосування спеціальних знань — судової експертизи.

Ключові слова: спеціальні знання; експерт; обізнана особа; судово-експертна методика; висновок експерта, досудове розслідування, статистичні данні, судова дорожньо-технічна експертиза, дорожня інфраструктура.

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