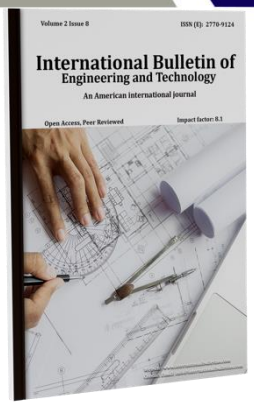

EXPERIENCE OF CERTAIN FOREIGN COUNTRIES IN INVESTIGATING CRIMES RELATED TO VIOLATIONS OF TRAFFIC SAFETY RULES OR VEHICLE OPERATION, AND ITS APPLICATION TO THE NATIONAL LEGISLATION OF THE REPUBLIC OF UZBEKISTAN

Majidov Jamshed Abdulla ugli
Independent Researcher at the Academy of the
Ministry of Internal Affairs of the Republic of Uzbekistan
https://doi.org/10.5281/zenodo.15332614

Abstract. The article presents the author's views on the experience of some foreign countries and its application to the national legislation of the Republic of Uzbekistan.

Keywords: investigator, inquiry officer, crime scene, inspection, personal rights, personal freedoms, road traffic accident.

It is worth noting that in recent years, our country has adopted a number of legislative acts aimed at reliably protecting individual rights and freedoms, respecting human dignity, and implementing international standards and advanced foreign practices in this field. In this context, it is no coincidence that the Decree of the President of the Republic of Uzbekistan No. UP-60 dated January 28, 2022[1] defines increasing our country's role as an equal subject in international relations and enhancing our country's image in the world community as goals of our development strategy.

Therefore, we must conduct thorough research in every field, learn from the best practices of foreign countries, and achieve even better results through comparative analysis to secure a worthy place in the world community. This includes the field of criminal investigation. In this regard, I believe that, as Sh.M. Mirziyoyev emphasized, "we must constantly be in search, deeply study advanced foreign experiences, and strive to renew our lives and working methods"[2].

Indeed, "comparative legal research, on the one hand, helps to identify all the beneficial factors that have proven effective in solving the main problem abroad, and on the other hand, provides an opportunity to consider the negative aspects of foreign experience and the ineffectiveness of certain legal solutions"[3].

In the words of M.E. Muminov, "The exchange of experiences, sharing of opinions, and adoption of positive aspects have always yielded positive results, whether between individuals, communities, or states"[4].

Ma’lumki boshqa jinoyat turlari qatori transport vositalari harakati yoki ulardan foydalanish xavfsizligi qoidalarini buzish jinoyatlarini tergov qilish bo‘yicha xorijiy mamlakatlarning ijobiy tajribasini O‘zbekiston qonunchiligiga va tergov amaliyotiga joriy etilishi muhim ahamiyat kasb etadi.

Legal families are mainly subdivided into Anglo-Saxon and Romano-Germanic legal families based on the criterion of common sources, the structure of law, and the historical path of its formation[5]. However, although the criminal legislation of countries belonging to the Anglo-Saxon or Romano-Germanic legal family on crimes related to violations of traffic safety rules or the operation of vehicles has different content and structure, they are united by common aspects in the methodology of investigating these types of crimes.

We all know that in the world community there are states whose statehood and unique legal system have been formed for several centuries, and their vast experience in investigating crimes is very ancient. For example, the first functional internal combustion engine was created by Gottlieb Daimler in 1883, while the first car was created two years later in Germany by Karl Benz[6]. The long-distance driving test of this car was carried out by the inventor's wife, Bertha. On August 5, 1888, he and his children traveled more than a hundred kilometers to see their mother. Later, in 1926, Benz merged with Daimler and began producing cars called "Mercedes-Benz"[7]. Cars began to be produced in other countries, such as France and the USA, starting in 1903.

Looking at the history of road accidents, the first fatal collision of a road vehicle with someone was in 1869 with the British scientist Mary Ward, who fell directly from a steam engine under the wheel[8]. On May 30, 1896, the first accident in history was reported in New York. Henry Wells' electric car collided with Evelyn Thomas's bicycle[9]. On August 17, 1896, in London, a car driven by Arthur Edsell hit a 44-year-old mother of two, Bridget Driscoll, causing the death of the world's first pedestrian[10].

As cars became popular, local authorities established traffic rules to limit collisions with horse-drawn carriages and ensure safety. Mandatory vehicle registration was one of the first traffic rules in the United States. New York became the first sample state in 1901 to require car owners to register their vehicles. By 1920, car license plates were mandatory in all states. Requesting a driver's license for the states took longer. There were 39 states that issued licenses in 1935 and only a few applicants who passed the test. Until the 1930s, most drivers were trained by car dealers, non-profit organizations such as YMCA, family members, and friends. However, shortly after, driving education was provided in secondary schools[11].

As the number of vehicles increased, the number of road accidents increased, there was a need to ensure road safety and regulate traffic. William Phelps Eno is the author of the traffic rules we currently follow - stopping at a red light and continuing at a green light, and other similar traffic rules. Therefore, he was awarded the title "Father of Road Safety" in history. In 1900, he wrote the pamphlet "Road Traffic in Our Streets Must Be Reformed Immediately," which immediately presented him as a road safety expert. In 1903, he developed the world's first city transport code (for the city of New York) and the first transport plans for New York, London, and Paris. It was William Phelps Eno who invented the "Stop" signs and envisioned one-way streets, taxi stops, turns, and pedestrian safety islands. He wrote the first guide to traffic rules for the police and created a roundabout around the Arc de Triomphe in Paris[12].

From the above, it can be seen that in the USA and a number of other developed countries, issues of ensuring road safety and traffic rules were formed even before the entry of cars into the territory of our country. Along with this, the practice of investigating road traffic accidents has also emerged and developed.

We know that our lives are changing day by day, even within minutes. Of course, the role of information technologies in this is invaluable. Along with this, the types and technical capabilities of vehicles are increasing day by day. Manufacturers are introducing new approaches to car production. Based on this, we can conclude that the investigation of crimes related to the violation of traffic safety rules or the operation of vehicles is becoming increasingly complex. Unfortunately, we are not keeping up with the times. Because in judicial and investigative practice, we still use the traditional methodology for investigating this type

of crime. At a time when information technologies are developing, we have not established the use of new modern technologies in investigative actions. Based on this, in our research work, we decided to conduct a scientific analysis of what new modern technologies are used in the process of investigative actions in developed foreign countries.

Based on our analysis and research, let's consider a new modern technology, namely a 3D scanner, used in the process of investigative actions in foreign countries.

It is known that proper and accurate documentation of the crime scene is important in its detection, but the process can often be complex and time-consuming. Therefore, three-dimensional visualization of various stages of criminal investigation is becoming increasingly popular in forensic examinations[13].

According to V.I. Eremchenko, the most promising areas for the use of 3D scanners in law enforcement agencies today are:

1. Record the inspection of the scene of the incident;
2. Study the trajectory of the axis;
3. Analysis of bleeding;
4. Reconstruction of the sites of accidents, incidents, and plane crashes;
5. Registration of explosion traces;
6. Creating portraits[14].

Currently, the capabilities of 3D scanners and the feasibility of their implementation in law enforcement agencies are being studied in the USA, Great Britain, Israel, Australia, and other countries. Police officers in the city of Roswell (New Mexico, USA) were among the first to test these devices. The investigator, who used a 3D scanner, noted that this significantly simplified the work of preliminary investigation bodies, made it more precise, and increased work productivity. The 3D scanner is equipped with an information-recording laser. After the data is loaded into the computer, the program creates a 3D image, which allows the investigator to be practically brought to the scene of the incident. Detectives will be able to reproduce panoramic images, enlarge or reduce the image on the iPad or any other tablet"[15].

In the UK, with the help of a laser scanner and an industrial 3D printer, employees have achieved success in investigating crimes committed 10 years ago. Initially, the police carefully scanned the crime scene, and then, based on the images, created a 3D model depicting evidence, objects, and even the weapon of the crime, which is important for the investigation. North Yorkshire police purchased a 3D scanner to reconstruct various accident scenes. This new acquisition allows the police department to collect information on the site, which can be used later in other cases. A 3D scanner is not only effective in collecting evidence from the accident scene, but also an effective tool that saves time. For example, when two motorcycles and a car collided, a 3D scanner, using its magic, allowed for the collection of valuable data that could be collected for several hours or hours[16].

In 2015, at a meeting between representatives of the US Department of Homeland Security (DHS) Department of Science and Technology and Israeli police officers, the creation of a technology capable of converting an accident or crime scene into an interactive 3D model in a matter of minutes, based on high-resolution (HD) video recording, was discussed. As a result, the Israeli company B-Design developed a 3D-Hawk, which consisted of a HD video camera, a special set for site survey set for top-up photography, a short holder for close-up photography, a smartphone to demonstrate what the camera takes, and a laptop with

software for converting video into a 3D model. "The uniqueness of this device is that it is primarily intended for other operational services, such as police and firefighters, sappers."

In May 2018, officers of the Ferfax County Police Department (Virginia, USA) tested the new device in three types of simulated scenes: an accident, an explosion of a mined car in an open area, and a murder inside a building. He noted the simplicity of the test results and the minimal time (about 5 minutes) spent on obtaining accurate information about the "presentation of the physical field of the real world." According to experts, "this technology can be successfully used not only for photography, but also for further documentation of crime scenes and reconstruction of the accident scene." As a result of these tests, within the framework of a bilateral agreement between the Israeli government and the US Department of Homeland Security, it was decided to introduce 3D-Hawk into the work of the Israeli and Ferfax County police, the Ohio State Road Patrol Service (USA), and the federal training centers of law enforcement agencies[17].

The Australian police also have a portable 3D scanner called Zebedee. The device allows measuring 40,000 kilometers per second. The Australian state police of Queensland stated that thanks to the Zebedee 3D scanner, a three-dimensional map of the crime scene can be created in about 20 minutes, which allows reducing the investigation time by "hundreds of hours"[18].

In China, a lot of scientific research has been conducted and continues to be conducted on crime related to violations of traffic safety rules or the operation of vehicles at the scene of an incident. Among such researchers, the scientific research of Du Xinguang, Jin Xianlong, Zhang Xiaoyun, Shen Jie, Hou Xinyi deserves high praise.

They studied the feasibility of providing preliminary data for the investigation of a road traffic accident and the reconstruction of a road traffic accident (RTA) using photogrammetric techniques, and when comparing it with the traditional roller film used by the Shanghai City Public Security Bureau's traffic police in 142 traffic situations, it was proven that photogrammetry is a time-saving and economical method for investigating accidents. During their research, they discovered that photogrammetry has great potential for application in the investigation and reconstruction of accidents[19].

Despite the effectiveness of 3D scanning technology, the main obstacle to its widespread use is the cost of devices. Thus, the cost of ground-based LiDAR scanners traditionally ranges from $20,000 to $70,000. Portable scanners are cheaper, from 5 to 18 thousand US dollars.

In addition to the large initial costs of acquiring a scanner, researchers highlight the following problematic situations associated with the introduction of 3D equipment into police activities:

1. Large volumes of scanned data require updating the server infrastructure for data storage and backup;

2. Software licensing;

3. Weather restrictions due to the inability of some 3D scanners to work outdoors in bright sunlight or during rain;

4. Training employees in the use of 3D scanning technology, data acquisition, and processing[20].

However, nowadays, you can use the same, but convenient and affordable option when inspecting the scene without purchasing expensive 3D scanning technology. Because in 2020, Apple introduced a light and distance detection (LiDAR) sensor to its high-end mobile devices.

In 2022, the iOS application Recon-3D was launched. This app turns an iPhone or iPad into a 3D scanner[21].

This light detection and distance measurement (LiDAR) sensor uses infrared light pulses to measure the distance between the sensor and the object surface, the time it takes for the emitted light to touch the surface and return to the LiDAR sensor. The method of determining the distance to a surface or object using the speed of light is called flight time (TOF). This method provides information about the distance to certain points. The scene's color data is usually captured with an additional camera, and RGB data is assigned to the corresponding coordinates. Accordingly, a mobile device such as a smartphone or tablet can be used as an optical 3D scanner with the addition of a LiDAR sensor, cameras, position sensors, and a program for collecting and processing all sensor data. Currently, there are a number of applications for iOS mobile devices that use Apple's LiDAR technology to obtain 3D data. Some of these applications have already been tested and are available for use in forensic medicine and other related fields[22]. In May 2022, Eugene Lissio, P. Eng, launched the Recon-3D app for iOS mobile devices. This application is intended for inspecting the crime scene and the crash site[23].

In our opinion, there are a number of positive aspects. For example, 3D scanning technology can improve or replace the process of manually measuring objects and creating a two- or three-dimensional diagram of the crime scene. One of the main advantages of 3D scanning technology is its ability to quickly collect large amounts of data. Such opportunities are especially valuable in the investigation of crimes with a large amount of material trace evidence. Thus, during the inspection of the scene of an incident related to a plane crash or an accident involving a large number of participants, it can be difficult to establish all the important details. If 3D scanning technology is used in such situations, investigators can return to the three-dimensional model of the crime scene at any time and perform appropriate measurements of the area itself and its individual objects that were not initially included in the handwritten scheme for various reasons.

Also, today with the increase in the number of vehicles, as well as their speeds, the number of fatal accidents is increasing. This creates difficulties and takes considerable time for law enforcement officers to document evidence and measure the signs of a significant event during the investigation of road accidents. As a result of research conducted on this topic, it was confirmed that several minutes spent on clearing the scene of the incident were wasted, and 4-5 minutes were wasted on unloading vehicles[24].

If an accident occurs on the streets of a city with frequent traffic jams, such as the city of Tashkent, the most important task facing the investigator or inquiry officer is to inspect the scene of the accident in the shortest possible time and clear the road for the free movement of other vehicles. However, there is no physical possibility of a qualitative examination of the scene in a very short time. For example, measurement work itself takes several tens of minutes. We know that in the last few decades, we have mainly used tape as a measuring instrument when inspecting the scene of an accident. However, both the traditional measurement method and slightly newer methods of examining the scene of the incident have many shortcomings. For example, high traffic, large number of employees and citizens entering and leaving the scene, weather conditions, and other factors hinder the completeness, accuracy, and quality of measurement work. In addition, if there is inaccurate or missing information after clearing the scene of the accident, it is impossible to double-

check all these methods with the original result. These issues demonstrate the importance and significance of implementing 3D scanning technology.

By now, the emergence of a modern computer and a modern user interface has made photogrammetry possible to cover a wider range of users and beyond large institutions and research institutions[25].

Photogrammetry is a technology for obtaining information (three-dimensional data or qualitative data) by analyzing and interpreting photographs. Many publications have spoken about the use of close-range photogrammetry in the investigation of road accidents. The analysis conducted by Conner and Walton examined how the Texas Department of Transportation and police offices could use photogrammetry in examining the scene of the incident[26].

While Wang and Zhang discussed the development and accuracy of using photogrammetry in investigating the scene of the accident,[27] LU and LIU explore a method of using two or more photographs to reconstruct measurement points.[28] In addition, Guang-quan and Xu, Hong-guo, Li, Yi-bing, Zhou, Li, Tian, Jian, Li, Jiang and Ding, Tongqiang, Ya-qiao, Shiyan and Su, Shilin, and others have conducted numerous studies using simultaneous image processing methods for automatic detection of appropriate recording points for camera calibration.[29]

Also, at the same time, in Western European countries, many scientific studies have been conducted on the use of 3D scans at the scene of accidents, and their widespread implementation in practice has been achieved.

We fully support the ideas put forward by Darja Topolšek, Elvis A. Herbaj, and Marjan Sternad. In their opinion, "the purpose of road traffic accident reconstruction is to reconstruct the event necessary for analyzing the dynamics of the collision, which is used as evidence in court cases. Accident reconstruction and event presentation require accurate measurement data. However, there are differences between individual measuring instruments and methods related to the inspection of the accident scene, just as there are differences between the degree of their use and the accuracy of measurements. The most commonly used method is the measuring tape, after which measurements are taken with general stations and laser rangefinders, and photogrammetry is also becoming increasingly important. The advantages and disadvantages of personal tools and methods affect the required number of researchers, copying, measurement range, applicability depending on lighting and weather conditions, the possibility of remote measurement, data collection time, scope, possibility of further processing, accuracy and volume of collected data, and primarily all collected data. The latter is very important for proving the guilt or innocence of the accident participants in court, since inaccurate information can lead to an unfair verdict. The accuracy of measurement using the aforementioned tools and methods also varies depending on which one is used, as well as other factors"[30].

Moreover, as S. N. Dumnov noted, the time spent scanning the crime scene using a 3D scanner is insignificant compared to traditional recording devices[31].

Based on the foregoing, in our opinion, the introduction of 3D scanners would be economically feasible if crimes characterized by numerous material traces (traffic accidents, plane crashes, violent crimes, etc.) are investigated. Foreign experience in the use of 3D scanning technology, in our opinion, can be successfully applied in the activities of law enforcement agencies of the Republic of Uzbekistan, especially in carrying out investigative

actions such as inspecting the scene of an incident in cases of violation of traffic safety rules or operation of vehicles and other crimes.

The obvious advantage of 3D scanning technology is the ability to compare the obtained results with the electronic database available in law enforcement agencies (persons, missing persons, convicts, weapons and objects used as weapons, etc.).

In addition to the above-mentioned areas, it is necessary to mention the registration, acquisition, and analysis of material traces (footprints, footprints, handprints, teeth, bite marks on soft tissues of a person), the study of which is carried out using various methods, and as a result, obtaining significantly more factual data.

Another strength of a 3D scanner is its 100% objectivity during data collection. Human intelligence can highlight or even ignore a number of elements that may be important in reconstructing the scene of the event. The use of a 3D scanner allows, in any case, under any conditions and at any time, to reproduce the entire scene of the incident before our eyes.

In our opinion, the implementation of 3D scanning devices in the activities of law enforcement agencies of our country should be carried out in stages in the following order:

firstly, studying foreign experience;

secondly, the creation of a regulatory framework governing the implementation and use of 3D scanners and other 3D technologies by law enforcement agencies;

thirdly, the development of courses and training programs for internal affairs officers on the possibilities of 3D scanning.

In conclusion, it should be noted that it is necessary to use new tools and methods in the detection and investigation of crimes, since information technologies can simplify and improve the quality of work performed. Despite a number of difficulties associated with the introduction of a 3D scanner into the activities of law enforcement agencies, these devices allow achieving high results in a relatively short time, which is clearly proven by the experience of foreign countries

References:

1.]Du Xinguang a, Jin Xianlong a b, Zhang Xiaoyun a, Shen Jie a, Hou Xinyi. Geometry features measurement of traffic accidents for reconstruction based on close-range photogrammetry. Advances in Engineering Software Volume 40, Issue 7, July 2009, Pages 497-505

2.Анализ затрат и выгод технологии 3D-сканирования для расследования на месте преступления. URL: https://www.sciencedirect.com/science/article/pii/S2665910719300258 (Elektron manbaga murojaat qilingan sana: 10.11.2023).

3.Soren Kottner,, Michael J. Thali, Dominic Gascho/ Using the iPhone's LiDAR technology to capture 3D forensic data at crime and crash scenes/ Forensic Imaging Volume 32,March 2023, 200535/ https://www.sciencedirect.com/science/article/(Elektron manbaga murojaat qilingan sana: 10.11.2023).

4.S.H. Miller, A. Hashemian, R. Gillihan, E. Helms, A comparison of mobile phone LiDAR capture and established ground based 3D scanning methodologies, in: 2022: pp. 2022-01–0832. https://doi.org/10.4271/2022-01-0832. (Elektron manbaga murojaat qilingan sana: 10.11.2023).

www.recon-3d.com(Elektron manbaga murojaat qilingan sana: 11.11.2023).

6.Cooner Scott A, Balke Kevin N. Use of photogrammetry for investigation of traffic incident scenes. Technical report, September 1999-August 2000.
7.Jechev D. Close-range photogrammetry with amateur camera, In: XXth ISPRS congress 12-23 July 2004, Istanbul, Turkey. Youth Forum papers, vol. XXXV, part B8. p. 136.
8.Cooner Scott A, Balke Kevin N. Use of photogrammetry for investigation of traffic incident scenes. Technical report, September 1999-August 2000.]Walton Jennifer R, Barrett Monica L, Kenneth R. Agent, evaluation of methods to limit the time taken to investigate crash site, June 2005.
9.Zhan, Zong-qian and Zhand, Jian-qian, Application of digital photogrammetry in surveying and mapping of the traffic accident site. J Highway Transport Dev. v1 i23. 147-152.
10.Liu, Rong, Zhang, Zuxun and Zhang, Jianqing, Research on multi-photo collinear condition constrained least squares matching and its application of traffic. J East China Geol Inst. v3 i26. 287-290.
11.]Lu, Guang-quan and Xu, Hong-guo, Application of photogrammetry in accident reconstruction and it's progress. J Highway Transport Res Dev. v18 i3. 49-51. Lu, Guang-quan, Xu, Hong-guo and Li, Yi-bing, Recognizing reference points for photogrammetry of traffic accident scene. Comput Appl. v3 i26. 711-715.Lu, Guang-quan, Xu, Hong-guo and Zhou, Li, Linear camera calibrating method used for measurement of traffic accident scene. China Civil Eng J. v7 i36. 61-66. Tian, Jian, Li, Jiang and Ding, Tongqiang, Automatic detection technology of reference points for traffic accident photogrammetry model. Comput Commun. v3 i23. 5-7. Tian, Jian, Li, Jiang and Li, Ya-qiao, Calibration technique of photogrammetry of traffic accident scene. J Jilin Univ (Eng Technol Ed). v36 i3. 136-139. Xu, Shiyan and Su, Shilin, Study of main problems about the photogrammetry in treatment of the traffic accident on the road. Mod Electron Tech. 8
12.Darja Topolšek, Elvis A. Herbaj, Marjan Sternad. The Accuracy Analysis of Measurement Tools for Traffic Accident Investigation. Journal of Transportation Technologies Vol.4 No.1(2014), Article ID:42384,9 pages/ https://www.scirp.org/html/8-3500158_42384.htm (Elektron manbaga murojaat qilingan sana: 11.11.2023).
13.Думнов С.Н. К вопросу применения метода лазерного 3D-сканирования при осмотре места дорожно-транспортного происшествия // Электронный журнал E-Scio. 2019. № 6(33).