



## THE ROLE AND SIGNIFICANCE OF PARKING IN TRAFFIC SAFETY

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**Abstract:** This article analyzed the problems of parking on highways, the negative effects of parking and parking spaces on highways in urban areas on road safety. Recommendations for the classification of parking spaces on highways into different levels have been developed. Basic solutions for on-street parking management are presented.

**Key words:** Car, road, street, parking, traffic safety, carriageway, traffic jams, central streets, traffic accidents, driver, road network

The development of the road transport system is important in the economy of any country, and it is widely used in all sectors of the national economy. This leads to an increase in the demand for cars, an increase in the level of motorization, and at the same time, the construction, modernization and perfect planning of highways are among the most important tasks.

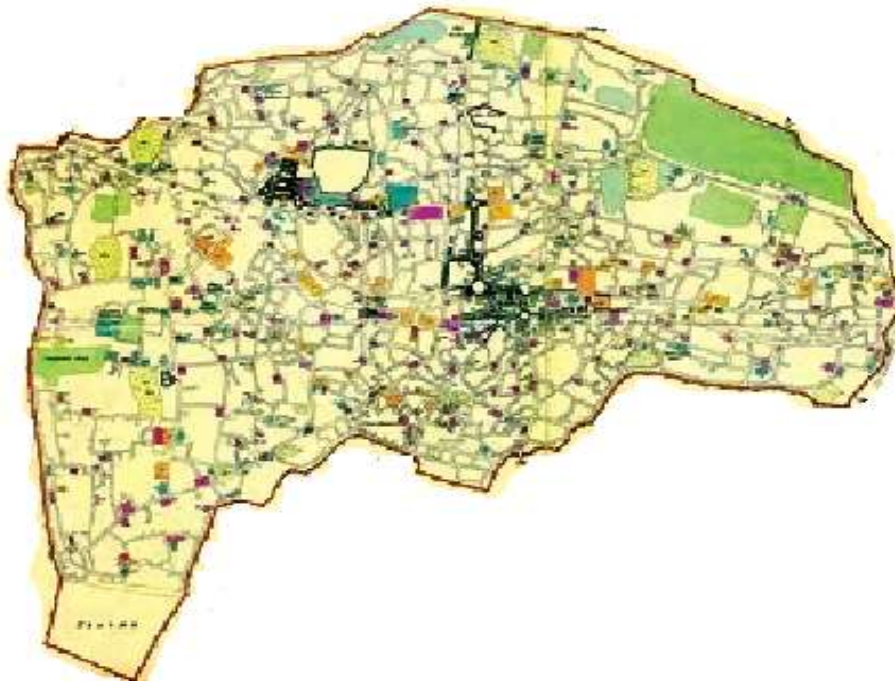
Development of the road sector is one of the most important tasks in the Republic of Uzbekistan today. In this regard, the Strategy of Actions for the further development of the Republic of Uzbekistan in 2017-2021, including the task of "implementation of targeted programs for the development and modernization of road transport, engineering-communication and social infrastructure" is defined. In order to fulfill these tasks, road construction and modernization of roads are being carried out in the country at an accelerated pace.

In the next three years, the State allocated 9.8 trillion soums for road construction [1]. In addition, Decree No. PF-5890 of the President of the Republic of Uzbekistan dated December 9, 2019 on the measures of deep reform of the road system of the Republic of Uzbekistan was adopted, in which specific goals and measures for the development of the road system were determined. If we look at the world statistics on automobiles, the number of cars in the world today is more than 1.3 billion. This indicator is increasing by 3.9% every year. According to the accounting books, by 2035 the number of cars on the planet will exceed 2 billion. Of course, with the increase in cars comes many problems, one of which is the lack of parking in city centers.

This problem causes traffic jams on all highways, central streets, reduced road capacity, toxic gases for the environment, high level of noise emission and many other negative consequences..

Today, the increase in the number of road traffic accidents (RTA) is seriously affected by the parking and parking of cars along the carriageway, that is, the reduction of the width of the road due to the improper planning of parking lots. On-street parking is a common form of parking that is known for its efficiency and ease of use for drivers, as it allows them to park their vehicles close to their destination. On-street parking has some advantages and disadvantages, which vary depending on the situation [5].

One of the factors that can increase the risk of accidents in on-street parking spaces is the narrowing of the roadway. Vehicles parked on the side of the road leave less space for oncoming vehicles, forcing them to move closer to oncoming vehicles in the next lane.



**Figure 1. Parking places along the road in Bukhara and the location of accidents on the map**

- Parking spaces for cars along the street
- - Accidents that occurred in the parking lot of cars along the street

In our republic, this situation was studied on the example of the city of Bukhara, the accidents that have occurred in the area of car parking along the city streets until now were analyzed, and it was found that the number of accidents is increasing in the parking areas along the road. The analysis of accidents included in the State Statistics on Independence Street, one of the central streets of Bukhara, showed that 9.3% of the total accidents on this street in 2020 were committed in the parking area along the carriageway. In 2020, 15% of accidents and 21.3% of accidents in 2021 occurred in the parking area of cars along the roadway.

The analysis of traffic accidents included in the State Statistics on Gijdivoni street, one of the central streets of Bukhara, showed that in 2020, 20% of the total traffic accidents on this street were committed in the parking area along the carriageway. In 2020, 28% of accidents and 35% of accidents in 2021 occurred in the parking area of cars along the roadway.

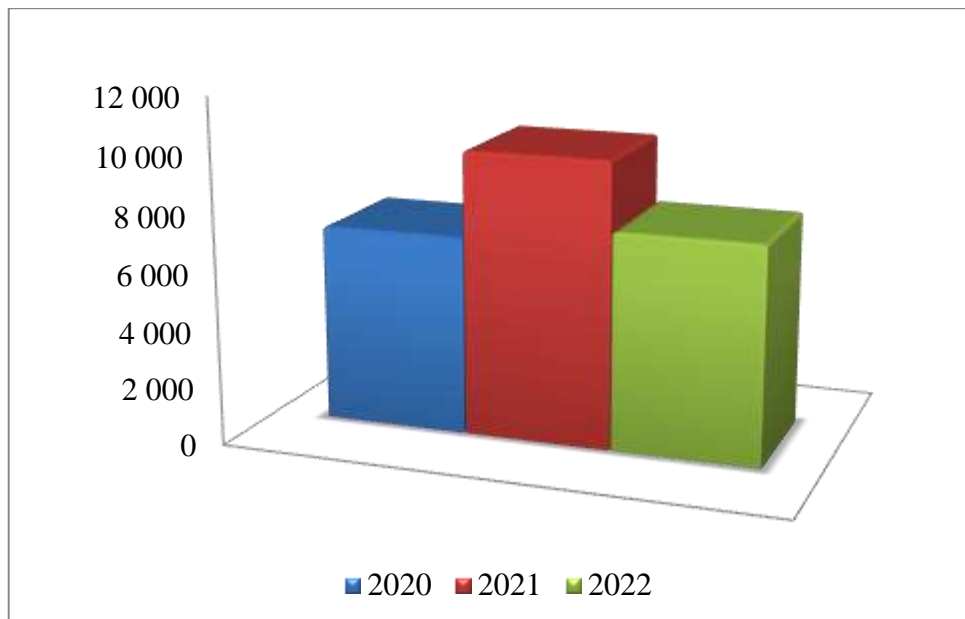
The analysis of accidents not included in the state statistics showed that in 2019, 31% of the total accidents on this street occurred in the parking area along the carriageway.

17% of accidents in 2020 and 22% of accidents in 2021 occurred in the parking area of cars along the roadway.

According to the analysis of traffic accidents in our republic over the last ten years, their average annual number does not fall below 6-7 thousand, as a result of which more than two thousand people of the citizens of our republic are killed and 9-10 thousand people are injured [2].

For example, during January-October 2022, 7,636 road traffic accidents were recorded, resulting in 7,174 injuries and 1,931 deaths. 226 of the dead were children.

For information, 10,001 accidents occurred throughout 2021, 9,230 people were injured and 2,426 people died as a result of these incidents. In 2019 and 2020, 1,915 and 1,962 people died in accidents in the country, respectively.



**Figure 2. Number of accidents committed in three years**

Analyzing the above figures, it can be seen that an average of 33% of the road traffic accidents that occur on the streets, included in the State statistics, take place on the roads where parking is organized along the street. This indicator is a very important indicator from the point of view of organizing traffic safety.



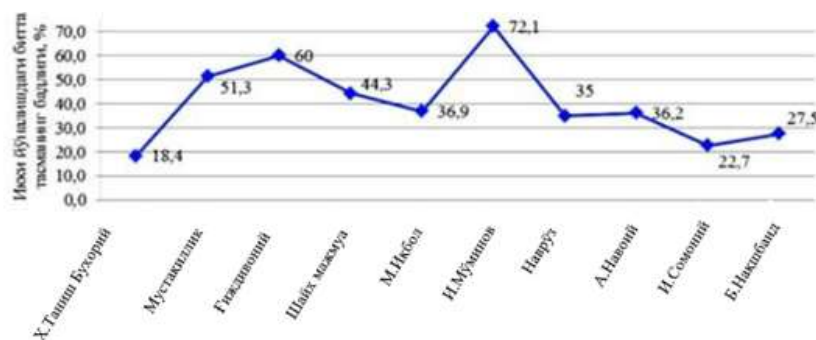
**Figure 3. Parking of cars along the street on Gijdivani street**  
Information about on-street parking in the central streets of Bukhara

Parking spaces were identified along the 43.02-kilometer road section in 10 central streets of Bukhara.

№	The street name		Total length of the street, km	Street parking spaces, km	The length of the parking lot, km				The number of the carriageway is one way	The number of intersections and connections, piece
					45 <sup>0</sup> -60 <sup>0</sup>	90 <sup>0</sup>	0 <sup>0</sup>	Total:		
1	Khafiz Tanish Bukhary	Right	14	3,5	1,4		4,1	10,5	2	55
		Left		7	1,5	5,5	2		78	
2	Independence	Right	3,9	2,4	0,55		1,85	4	3	22
		Left		1,6		1,6	3		19	
3	Gijdivani	Right	1,2	0,72			0,72	1,42	4	13
		Left		0,75		0,72	4		9	
4	Sheikh complex	Right	3,65	1	0,85		0,15	2,35	4	9
		Left		1,35	0,40	0,95	4		8	
5	M. Iqbal	Right	4,25	1,55	0,23		1,34	3,14	3	12
		Left		1,57	1,4	0,17	3		13	
6	I. Mominov	Right	6,8	4	3		2	9,8	3	18
		Left		4,8	0,50	4,3	3		27	
7	Novruz	Right	2,4	0,80	0,35		0,45	1,61	3	7
		Left		0,83	0,30	0,53	3		9	
8	A. Navoi	Right	3,8	1,5	0,42		1,05	2,75	3	15
		Left		1,22		1,25	3		13	
9	I. Somoni	Right	3,2	1	0,35		0,65	1,42	3	11
		Left		0,45		0,41	3		11	
10	B. Pattern	Right	7	4,06	0,30		3,76	6,03	3	28
		Left		2	0,25	1,75	3		19	
<b>Total:</b>			<b>50,2</b>	<b>42,1</b>	<b>11,8</b>		<b>33,25</b>	<b>43,02</b>		<b>396</b>

It turned out that 11.8% of them are parking spaces along the street, parked at an angle of 45<sup>0</sup>-60<sup>0</sup>, and 33.25% are parking spaces along the street, located at an angle of 0<sup>0</sup>, that is, parallel to the roadway. In addition, the analysis showed that more than 50% of the single lanes on several streets are busy during the day in both directions.

The conducted studies showed that there are vehicles parked along the street in almost all main streets of Bukhara. 75% of these studied streets do not have on-street parking.





**Figure 4. Street occupancy graph with parked vehicles**

Parking and parking spaces are the cause of increasing traffic density, traffic jams and accidents in many cases on the highways of Bukhara.

The current situation identified in the parking and parking areas on the outskirts of the investigated highways creates the following dangerous situations and problems in the organization of traffic:

- reduces the overall width of the road, which in turn leads to a decrease in the road's passability;
- the possibility of collision with cars moving on this road during parking is very high;
- indirectly causes traffic jams on highways;
- difficulties in finding the parking area for drivers (guests);
- causes a lot of inconvenience for residents or organization workers in the area adjacent to the road.

In order to solve these problems, it is necessary to systematically implement the organization of special parking lots for the parking and parking of cars on the highways of Bukhara, to develop them in a way that is convenient, advantageous for drivers, and their location is understandable and simple, while informing the location of parking lots using modern technologies. gives an effective result. At the same time, special requirements for drivers in on-street parking spaces and specially organized parking spaces, precautionary measures and special signs will prevent dangerous and fatal situations.

The Smart parking program is widely used in the efficient operation of parking lots. Through this program, drivers are shown the location of parking lots and the routes to them on special maps.

Smart Parking is a system that uses smart sensors and smartphone software to inform and navigate the driver about available parking spaces nearby, and the driver can get information from a smartphone about a space a short distance from his home. These smart parking lots provide great convenience for drivers, i.e., the driver does not spend a lot of time looking for a place for a car, and it also provides many conveniences in parking lot management. In order to effectively organize and manage car parking spaces, it is necessary to have more information: how much parking space there is; what time of day; how long; how many cars use a certain location per day, etc.

To get such information, it should be Smart technologies [5]. These technologies allow online monitoring of the occupancy of a parking space. One such technology is the smart street parking system. Today, street parking is widely and efficiently used in many foreign countries, and the work in this regard is being improved day by day.

In short, it is necessary to strictly adhere to the requirements of traffic safety in the effective organization of highway parking spaces in our country, to categorize the road network with modern information technologies and separate convenient parking spaces at different levels.

It is very important for our drivers to organize places to park their cars in the nearest parking lots even during the mapping of daily essentials.

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