

ORGANIZATION OF SAFE TRAFFIC DURING REPAIR WORKS

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Abstract. *This article discusses traffic safety issues on repaired sections of highways and provides recommendations for eliminating problems that have arisen.*

Keywords: *repair, machinery, road signs, traffic safety, technical means, road sections.*

Efficiency can be achieved through proper organization of traffic on roads, improving the consumer characteristics of roads, ensuring the performance of transport and operational indicators at the level of regulatory requirements, and ensuring service life.

Approval of resolutions and orders of the Government on development of road network, as well as realization of tasks specified in these decisions are among the most urgent issues of state importance. Today in our republic a lot of work is being done on construction and reconstruction of highways.

PQ-330 dated October 10, 2023 "On measures to further improve the road sector" dated October 10, 2023 in order to create and digitalize a modern road management system, strengthen quality control in the field, create conditions for the wide involvement of the private sector of enterprises, and improve the efficiency of budget funds. The decision is confirmed. The decision identifies the main participants in the process of reforming and further developing the road sector and their tasks.

Ensuring traffic safety on repaired or reconstructed road sections is one of the most important tasks, and if technical control devices are not installed in time at the level of regulatory requirements, it will cause a number of problems.

Especially in our republic, where today the speed of vehicles on highways and city streets is rapidly increasing, and if we look at the example of the city of Tashkent, the capital of our republic, a major metropolis, it causes traffic jams and congestion and can lead to an increase in the number of accidents.

It is possible to increase the efficiency of use of highways and vehicles by improving the quality of transportation and operational indicators of highways of our republic.

Today, in order to improve the transportation and operational condition of existing highways, various repair works are carried out on the sections. It is not always possible to say that the work on organization of road traffic on the repaired road sections is carried out normally.

Observations and analysis show that the road sections under repair do not fully meet the regulatory requirements as shown in Figure 1, which affects road safety and slows down traffic. (Figure 1).

To date, according to the statistical data of urban street and road sections, the condition of the street and road network of Tashkent city is presented in the following table (Table 1).

Currently, extensive work is being carried out to adapt the consumer characteristics of urban streets to the level of international requirements and improve the transportation and operational performance of the road. For example, A. Navoi, one of the central main streets of the city, Fergana Yoli Street, which is one of the main entrance streets to the city, connecting Tashkent

with the main and local roads, today has a high level of drainage. It is one of the city's major entry streets, and the scheme to ensure its smoothness, stability and traffic safety. It is one of the main streets closest to international requirements, differing significantly from other streets.



Figure-1. In real conditions, road signs and guardrails are installed on the section of road being repaired.

Carrying out repair works according to this model in all regions of our republic, reconstruction at a high level, construction of smooth, durable and safe roads meeting international requirements is one of the urgent tasks for our republic, where the speed of road traffic is rapidly increasing.

When carrying out repair work on highways and city streets, international highways are repaired first, according to the importance of existing roads, then republican highways, and on city streets and the main and central streets are repaired first. roads. roads.

Ensuring traffic safety on repaired or reconstructed road sections is one of the most important tasks in road maintenance, and if technical control devices are not installed in time at the level of regulatory requirements, it will cause a number of problems. Therefore, on the sections allocated for repair or reconstruction, first of all, in coordination with the "Road Safety Department", a "Scheme for the organization of traffic flows" will be developed to change the direction of traffic flows on these road sections. Depending on the speed of the road sections being repaired or reconstructed, it is advisable to display the "Scheme of organization of traffic flows" on the panels to provide information about the road condition to road users at a certain distance in advance.

Technical means of traffic organization warn road users about various hazards and help them choose the right direction and mode of movement. It prevents vehicles from entering repair areas and restricts access of unauthorized persons to the construction site. It creates convenience by determining the order of movement of vehicles on narrowed road sections.

Among the technical means, the most important are road signs that provide information. The most important road signs are the following [2] (Fig. 2):

A sign (1.23. "Repair Works") to warn road users of approaching dangerous road sections;
- informing drivers about the change of traffic direction (3.1. "Entry prohibited", 5.31. "Detour image", 5.32.1., 5.32.2. "Detour direction") and regulating the detour of an area closed to traffic (5.34 .1 , 5.34.2. "Initial indicator of re-routing to another traffic section");

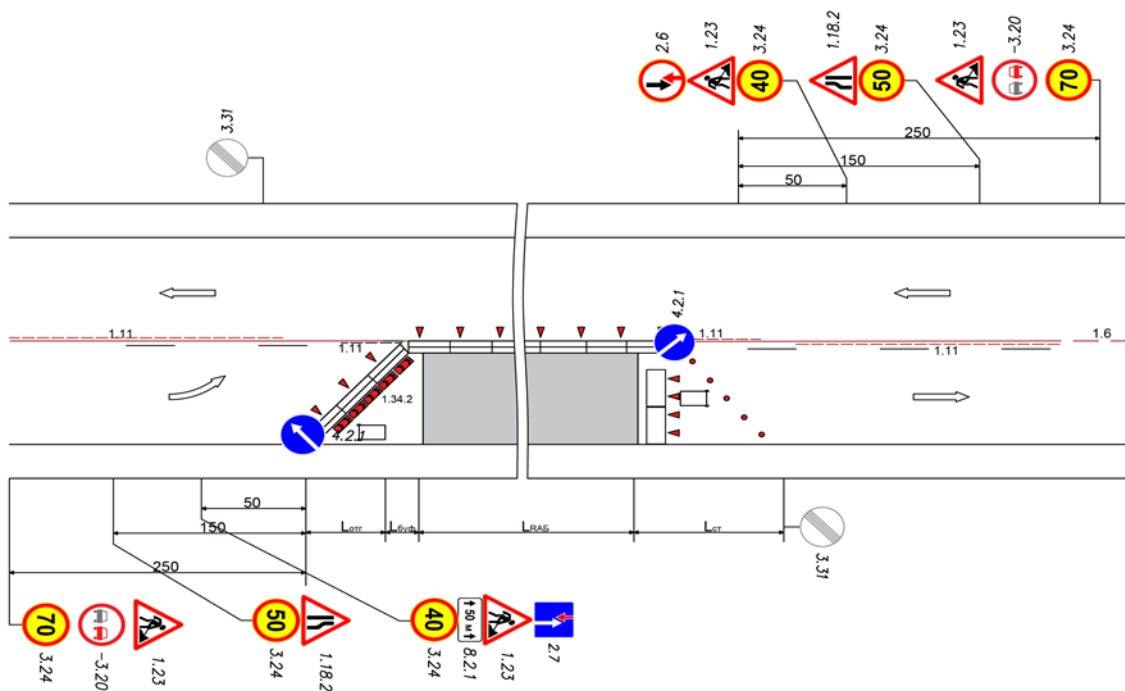


Figure-2. Scheme of traffic organization and equipment of road barriers on the road section where repair works are carried out on half of the two-lane road.

- drivers on narrowing road sections (1.18.1, 1.18.2, 1.18.3 "Road narrowing", 3.14. "Limited width", on narrow road sections, 2.6. "Oncoming traffic priority", 2.7. Signs "Preference to oncoming traffic";
- speed limit signs (3.24. "Maximum speed limit" or 3.20 "Overtaking prohibited");
- signs (3.27. "Parking Prohibited" or 3.28. "Parking Prohibited") prohibiting parking and standing of vehicles when approaching the construction site;
- sign (10) of the specifications (3.31. "End of All Restrictions") indicating that all restrictions are lifted after passing the reduced road area.

No more than 3 traffic signs shall be erected on one base, and the distance between poles shall not be less than 50 meters on highways and 25 meters in residential areas.

When these signs are installed, they are installed based on calculations based on the speed of traffic on the road (Figure 2). Own Dst 3283:2019. State standard of the Republic of Uzbekistan. "Road signs. General technical conditions".

On two-lane roads, when carrying out repair works on one side of the carriageway, the organization of traffic on one side of the carriageway using the edge of the road is one of the most preferable ways, at the same time it has a low cost, that is, economic efficiency.

In the course of operation of highways, it is allowed to apply traffic management schemes by means of arrangement and use of detours or temporary detours for complete repair of the transport section of the road on the road sections under reconstruction or repair works (Fig. 3).

Depending on the location of the road, it is possible to organize traffic by detouring on side or parallel roads when carrying out repair works in urban or residential areas. The scheme of organization of traffic circle should be placed on billboards for advance warning of road users [3].

Such a detour scheme also creates good conditions for the work of machines and mechanisms performing repair technological processes on the repaired section on the road sections where traffic is organized (Fig. 3).

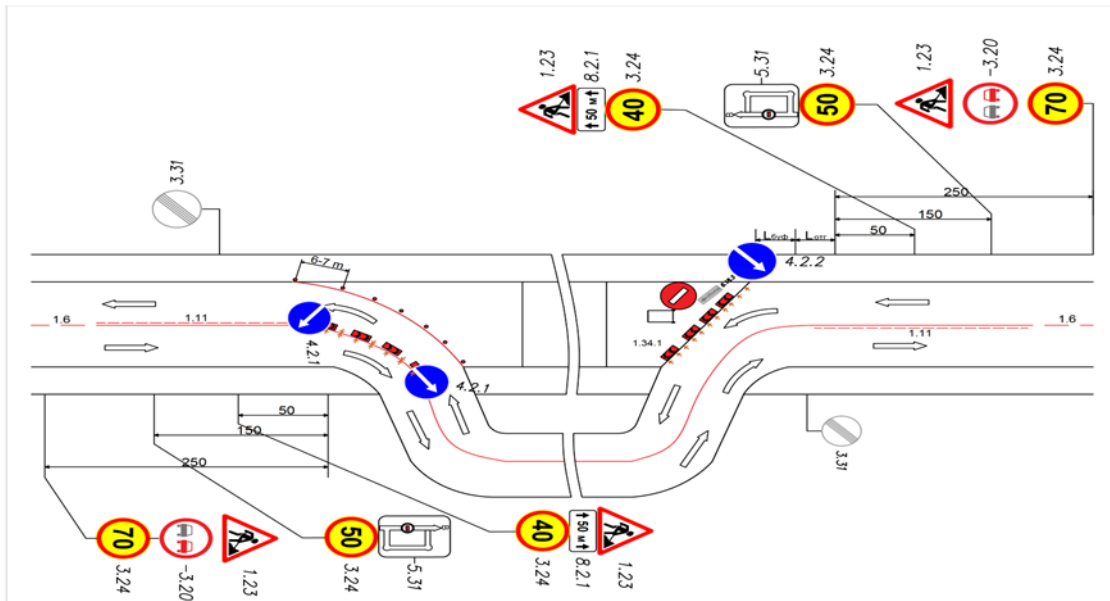


Figure-3. On dual carriageway roads using temporary roads on the section of road where repair work is being carried out. Traffic organization scheme

Preventing traffic jams on highways and city streets, increasing road capacity, reducing the level of loading remains one of the most urgent tasks today, when the speed of vehicle traffic increases every day.

In accordance with the rapidly increasing level of motorization, in order to build, reconstruct and improve the quality of operation of highways, to ensure safe and high-speed movement of vehicles on highways, taking into account the requirements of today, the industry needs innovative technologies and modern machines with high productivity - this can be achieved by providing mechanisms, specialists with intellectual potential.

It is necessary to determine the procedure for organizing the movement of vehicles and pedestrians, ensuring the safety of road workers and road users in the places of repair works. Repair works on the road should be carried out on all roads and streets regardless of the category and importance of the road in order to organize traffic safety in the planned places. It is necessary to comply with the requirements of normative documents on organization and provision of road traffic safety.

In the dark time of the day, it should be illuminated in accordance with the requirements specified in regulatory documents. The norms of construction site lighting, as well as the barriers and devices used shall be equipped with permanent red signal lights. The main purpose of traffic organization and organization of works on fencing of the areas of road repair works is to ensure the safety of vehicles and pedestrians, as well as the safety of road workers performing repair works in this area. The main tasks to achieve this goal are:

- preventing accidents involving vehicles and pedestrians in the workplace;
- ensuring the speed of works, traffic and pedestrian flow on the repaired road sections;
- ensuring safety of construction workers and road service workers in the area of repair works.

These tasks are solved with the use of temporary technical means of traffic organization and road barriers, the type of which is selected depending on the type of works and road conditions.

The road section to be repaired is understood as the road section from the first road sign warning of road works to the last sign canceling the restrictions on the section in traffic modes [4].

Conventionally, the repair area can be divided into five functional zones, each of which solves specific tasks and ensures traffic safety (Fig. 6).

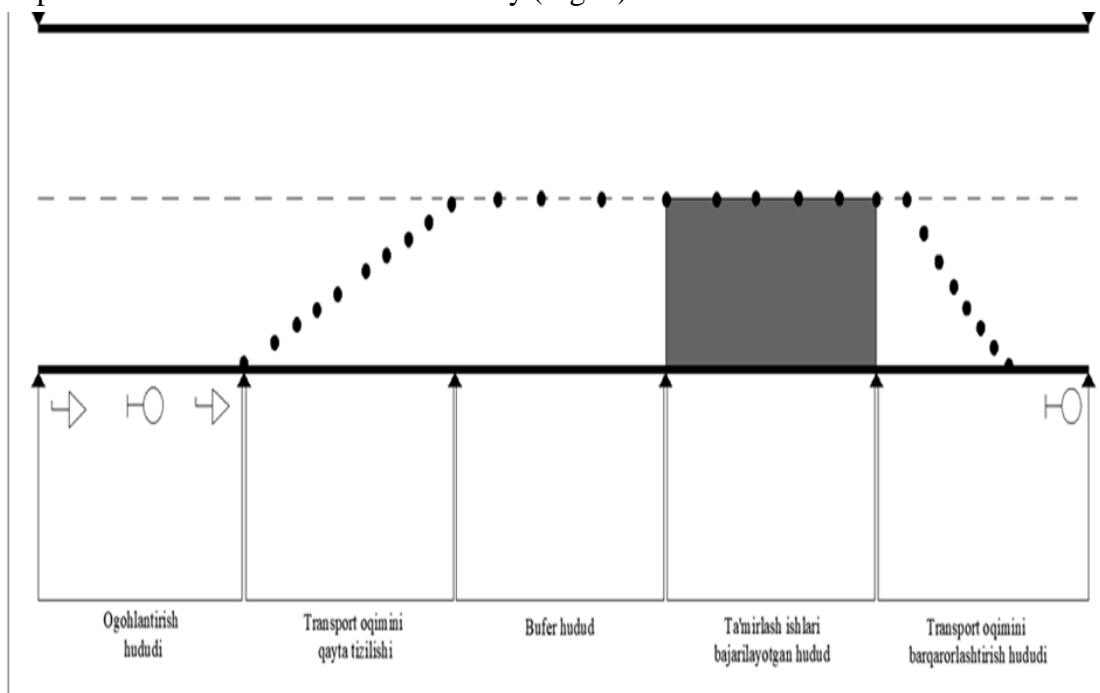


Figure-4. Scheme of delineation of the road repair works area.

These areas include:

- warning area;
- traffic flow reorganization area;
- buffer area;
- A repaired area;
- Traffic flow stabilization area.

The warning zone is designed to warn road users about the presence of the road construction site, about the dangers associated with the ongoing repair work, as well as to establish a safe mode of movement of vehicles on the road construction site. [5].

If the road utilization factor $Z > 0.6$, sign 3.27 should be installed at the beginning of the warning zone. In this section, depending on the nature of the work to be carried out, control is possible from a single road sign or through warning devices with colored beacons.

Vehicles shall travel on designated roads using pavement marking lines or road barriers in the area of the repair work.

In this section, the traffic flow path should be free for drivers, so for works lasting up to three days, technical controls such as road barriers, cones, plastic kerbs and temporary signs can be used to regulate the flow of traffic. Maintenance areas may be marked with cones, barriers, road marking lines or light signals used to regulate the flow of traffic.

If the duration of the work exceeds three days, parapet type concrete barriers should be used to restrict traffic flow.

Table-2

Types of motion modification	Length of the realignment area
Move to the next lane next to the cars.	L* not less than
Move to the next lane without merging into the flow of cars.	1/2 L at least
Realignment in front of the plaza with alternating traffic moving in different directions.	20-30 m
Moving from the flow stabilization zone of an adjacent lane into your own lane.	20-30 m
L* — minimum length of the traffic zone for the condition of redistribution of car flow to the neighboring lane.	

Technical means of traffic organization warn road users about various hazards and help them choose the right direction and mode of movement. It prevents vehicles from entering the areas of repair works and restricts the access of unauthorized persons to the construction site. It creates convenience by determining the order of movement of vehicles on narrowed road sections [5].

No more than 3 traffic signs shall be erected on one base, and the distance between poles shall not be less than 50 m on highways and 25 m in residential areas.

When installing road signs and road markings, they shall be installed depending on the speed of vehicles. Organization of traffic and blocking of the workplace when performing works with a dividing line on multi-lane roads with one-way traffic blocked in the middle lanes. During the survey of repaired roads on the streets of the city on the equipment of road technical control devices on the repaired road sections, it is seen that the installation of these devices does not meet the regulatory requirements, this situation creates a great danger for road users and does not ensure the specified speed of vehicles on the road, causes various risks, traffic jams (Fig. 5).



Figure-5. Condition of road markings and guardrails on the road section under repair.

Observations show that in developed countries, repair works are mainly carried out in the evening when traffic is not congested, which reduces traffic risk and eliminates a number of inconveniences.

In order to ensure the visibility of vehicles traveling in the left lane of the road, traffic signs will be reinstalled on the opposite side of the road during repair work on road sections with 4 or more lanes.



Figure-6. Condition of road markings and guardrails on the road section under repair.

Studying roadblocks and ensuring traffic safety on repaired road sections in the districts of Tashkent city, we see that they are not equipped in accordance with normative documents (Figure 7).

The figures given on the equipment of road technical control devices on the repaired road sections show that the installation of these devices does not comply with the normative requirements.

We can observe that works to improve traffic safety at repair sites are carried out today on the busy streets of our republic in the evening, when traffic speed is low. Repair works in the evening have many advantages, while reducing traffic congestion, delays and unnecessary costs. For example, the speed of traffic at night is very low, it does not cause traffic jams and other pleasantries.



Figure-7. Condition of road markings and guardrails on the road section under repair.

Conclusion.

After the roads are put into operation, the level of transportation and operational performance of the roads is ensured according to the normative requirements by continuously carrying out various maintenance and upkeep works.

The type of road repair is determined on the basis of information obtained from various road inspections, surveys and diagnostics.

By organizing safe traffic on the road section under repair, increasing road capacity, improving the environment by reducing the level of load, achieving the elimination of exhaust fumes, noise, dust and dust, traffic jams, jamming, violations of traffic rules. psycho-physiological condition of road users and a number of other problems.

When studying the territories where repair and rehabilitation works aimed at improving the condition of highways and city streets are carried out, we see that there are some shortcomings in the level of fulfillment of regulatory requirements for road safety in the regions where construction works are being carried out:

- information is not given on special panels or sheets before entering the construction or repair sections;

- absence of road equipment near the sections to be repaired;

- lack of fencing at construction sections, etc.

In this age of technology where the speed of vehicles is increasing, it is necessary to carry out the work of fixing such problems on time by the professionals of the official organization with the help of serious attention and regulatory requirements.

It is necessary to regulate the movement of vehicles in the repair areas and remove temporary road signs after the work is completed, otherwise these signs can confuse road users and create a great danger to their safety.

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