

ON THE ISSUE OF THE NEED TO USE MOBILE POINTS OF WEIGHT AND SIZE CONTROL IN THE REPUBLIC OF UZBEKISTAN

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ANNOTATION

Non-compliance by road users with established norms and rules in the field of transportation of oversized and heavy cargo creates a real threat to the life and health of citizens, as evidenced by statistical data on road accidents and deaths in road traffic accidents and leads to negative economic consequences, causing damage both state property, which includes the highway as a property complex of engineering and technical structures, and vehicles of various forms of ownership, incl. personal property of citizens. A significant influence on the wear and destruction of the road pavement of the carriageway and roadsides is exerted by the factor of exceeding the permissible axle loads of freight vehicles, the indicators of which have a pronounced upward trend on most public roads. Currently, work is underway in the Republic of Uzbekistan to create a system of weight and dimensional control of vehicles that would allow for the inspection of cargo vehicles and ensure the collection of funds to compensate for damage caused to roads. In the period 2020-2022 deployment and operation of 52 points of weight and size control are envisaged. The analysis shows that this quantity of PVHC planned for installation is 52 units. not enough to create a system. This will lead to an increase in the load on the roads of international, state and local significance that remain without weight and size control, which means a decrease in road safety, an increase in the number of places of concentration of accidents, a lack of protection of roads of these categories from the movement of trucks with overload, and a decrease in their overhaul periods. In this situation, based on the international experience of developed countries, the solution to the problem is proposed in the use of mobile points of weight and size control - PPVGK. The article considers and generalizes the experience of foreign countries in the field of weight and size control of cargo ATSPVGK. It is proposed to equip the regional territorial departments of the Committee for Automobile Roads under the Ministry of Transport of the Republic of Uzbekistan with PPVCs.

Keywords: cargo transportation, weight and size control, bulky and heavy cargo, weighing, stationary weight and size control post, automatic weight and size control post, mobile weight and size control post, axial load, dynamic scales, overload, special permission, highways.

Non-compliance by road users with established norms and rules in the field of transportation of bulky and heavy cargo creates a real threat to the life and health of citizens, as evidenced by statistical data on road accidents and deaths in road traffic accidents and leads to negative

economic consequences, causing damage to both the state property, which includes the road as a property complex of engineering structures, and vehicles of various forms of ownership, incl. personal property of citizens.

It is the provision of safe passage when organizing freight and passenger traffic, as well as the preservation of the road network, that is the main and necessary condition for solving other tasks declared by the country's leadership to develop the country's road complex as one of the most important necessary components of the further economic development of the state, incl. to create an economically comfortable environment for road users.

Currently, significant material, financial and technical resources are spent on the maintenance of the road network in the Republic of Uzbekistan. Heavy vehicles annually cause damage to state roads, and therefore billions of soums are required to restore road pavement. The problem of increasing the efficiency of using these costs is becoming increasingly important, in terms of managing the process of automobilization of the country, that is, the development and improvement of the transport complex as a whole and its individual subsystems, including the road network.

Despite the increase in the cost of maintaining and repairing state roads, the development and condition of the road network of the Republic of Uzbekistan does not meet the requirements for the efficient operation of road transport and does not ensure its uninterrupted operation with the growing demand of the economy and society for transport services.

There is a significant lag in the development of the road network from the pace of motorization of society. The volume of heavy cargo transportation is growing at a high rate, which, accordingly, entails an increase in the load on the road network of the Republic of Uzbekistan. With an increase in the carrying capacity of vehicles, on the one hand, the costs of transporting goods are reduced, and on the other hand, the costs of building, reconstructing and repairing the road network are increasing.

A significant influence on the wear and destruction of the road pavement of the carriageway and roadsides (Fig. 1) is exerted by the factor of exceeding the permissible axle loads of freight vehicles, the indicators of which have a pronounced upward trend on most public roads (Fig. 2).





Rice. 1. The results of the negative impact of the movement of trucks with overload on the roads of the Republic of Uzbekistan



Rice. 2. Freight vehicles with reloading on the roads of the Republic of Uzbekistan

If there is a rolling stock in the fleet that transports goods of vehicles with an allowable axle load for the driving axle of 11.5 tons and for the remaining axles of 10 tons, only starting from 2008, the pavement of the roadway on highways of I and II technical categories is calculated for the load 13 tons, on roads III, IV and V of the technical category - with an axle load of 10 tons. It should be noted that most of the roads are not designed for these loads.

At the same time, the equivalent wear coefficient of the pavement of the carriageway increases by 2.9 times in comparison with the axle load from 6 to 10 tons, and from 10 to 13 tons - by 6 times, which leads to intensive premature wear of roads and requires significant funds. for their maintenance and repair.

Currently, work is underway in the Republic of Uzbekistan to create a system of weight and dimensional control of vehicles that would allow inspection of cargo vehicles and ensure the collection of funds to compensate for damage caused to roads.

According to the Decree of the Cabinet of Ministers dated May 28, 2020 No. 337 "On measures to introduce control over the weight and overall parameters of vehicles" on the territory of the Republic of Uzbekistan in the period from 2020-2022. deployment and operation of 52 points of weight and size control is envisaged (Table 1, Fig. 3).

Table 1. Program of measures for the construction, modernization and equipping of weight and size control points with modern technical equipment in 2020-2022.

№	Automobile roads	Point address	Of these, by years (units):		
			2020 y.	2021 y.	2022 y.
In total, the total number of points in the Republic is 52, of which:			8	30	14
Republic of Karaklpakistan			2	2	—
1.	A380 "Guzor — Bukhara — Nukus — Beineu"	753 km	2	—	—
2.	A380 "Guzor — Bukhara — Nukus — Beineu"	698 km	—	2	—
Andijan region			2	2	—
3.	A373 "M39 highway — Gulistan — Boka — Angren — Kokan and Andijonorkali — Osh"	385 km	—	2	—
4.	A373 "M39 highway — Gulistan — Boka — Angren — Kokan and Andijonorkali — Osh"	475 km	2	—	—
Bukhara region			—	2	—
5.	M37 "Samarkand — Bukhara — Turkmanbashi"	212 km	—	2	—
Dzhizak region			—	4	2
6.	M39 "Almaty - Bishkek - Tashkent - Shahrisabz - Termiz"	1018 km	—	2	—
7.	A376 "Kokan — Jizzakh"	245 km	—	—	2
8.	M34 "Tashkent - Dushanbe"	174 km	—	2	—
Kashkadarinskaya oblast			—	2	—
9.	A378 "Samarkand — Guzor"	58 km	—	2	—
Navoi region			—	2	—
10.	M37 "Samarkand — Bukhara — Turkmanbashi"	147 km	—	2	—
Namanganskaya oblast			—	—	2
11.	4R117 "Toragorgan Sh. - Namangan sh. — Chortoq sh. — Keskanyor village. — Sassiksoy village. — M41 motorway»	6 km	—	—	2
Samarkand region			—	2	—
12.	M39 "Almaty - Bishkek - Tashkent - Shahrisabz - Termiz"	1081 km	—	2	—
Surkhandarinskaya oblast			2	2	—
13.	M41 "Bishkek — Dushanbe — Termiz"	1618 km	2	—	—
14.	M39 "Almaty - Bishkek - Tashkent - Shahrisabz - Termiz"	1334 km	—	2	—
Syrdarinskaya oblast			—	—	2
15.	M39 "Almaty - Bishkek - Tashkent - Shahrisabz - Termiz"	919 km	—	—	2
Tashkent region			2	4	4
16.	4R4-a to "Saryogochshahri"	5 km	—	2	—
17.	M39 "Almaty - Bishkek - Tashkent - Shahrisabz - Termiz"	807 km	2	—	—
18.	4R186 "Chinoz Sh. — Chinoz PQQP — Yallama q. — the border of the Republic of Kazakhstan"	5 km	—	—	2

№	Automobile roads	Point address	Of these, by years (units):		
			2020 y.	2021 y.	2022 y.
19.	4R20 "Korasuv q. — Boka sh. - Bekobod sh.	63 км	—	—	2
20.	M39 "Almaty - Bishkek - Tashkent - Shahrisabz - Termiz"	817 км	—	2	—
	Khorezmskaya oblast		—	4	—
21.	4R161 "Urganch Sh. — Cholish q. "Beruni sh."	11,5 км	—	2	—
22.	4R156-г "To the border of the Republic of Turkmenistan"	15 км	—	2	—
	Fergana region		—	4	4
23.	A376 "Kokan — Jizzakh"	45 км	—	2	—
24.	4R144 "Fergana sh. - Vodil village. - Hamzaabad village.	25 км	—	—	2
25.	4R147 "Margilan Sh. — Rishton sh. - Shooter q. — Karimdevona q — Konibodom sh.»	101 км	—	2	—
26.	4R143 "Fergana sh. — Kuvasoy sh. — Kyzylkiya sh.	25 км	—	—	2



Rice. 3. Map of the location of weight and dimension control points on the territory of the Republic of Uzbekistan, in accordance with the Decree of the Cabinet of Ministers of the Republic of Uzbekistan dated May 28, 2020 No. 337 “On measures to introduce control of the weight and overall parameters of vehicles”

An analysis of this document shows that this quantity of PVHC planned for installation is 52 units. is not enough to create a system and solve the key tasks of weight and size control, namely: improving road safety, reducing the number of places where accidents are concentrated, protecting public roads from overload, increasing their turnaround time on the entire network of public roads in the country.

Given that the length of public roads is 42,695 km in total, including: - motor roads of international importance - 3,981 km; highways of national importance - 14,100 km; motor roads of local importance - 24614 km. The Ministry of Transport of the Russian Federation has established the norm of 1 PVGK per 100-150 km. Based on the upper minimum limit of this standard - 1 SVGK per 150 km in total in the republic, only 121 SVGK are required for highways of international and state significance; in total for motor roads of international, state and local

importance - 285 PVGK.

An analysis of the document shows that all PVGCs will be installed on highways of international importance (34 units) and state significance (18 units). But at the same time, nothing is said about other roads of international and national importance, not to mention the roads of local importance. This will lead to an increase in the load on the roads of international, state and local significance that remain without weight and size control, which means a decrease in road safety, an increase in the number of places of concentration of accidents, a lack of protection of roads of these categories from the movement of trucks with overload, and a decrease in their overhaul periods. In this situation, based on the international experience of developed countries, the solution to the problem is seen in the use of mobile points of weight and size control - PPVGC (Fig. 4).



Rice. 4. Application of PPVC abroad

PPVGC has the following advantages, namely:

This option will not require significant investment and will allow the VMC to be more flexible in terms of axle load control. It is still recommended to build safe “pockets” (lanes for parking of vehicles) for PPVC. Many countries control and penalize excess axle load with the help of the Axle Code and show good results. All of these countries operate with a central server that collects and monitors the data received from the CBPP, which is a prerequisite. It is necessary to provide such an option for the Republic of Uzbekistan. In reality, PCVGC is difficult to control and monitor, and this method has the greatest risk of “human factor” involvement in all countries. Such a risk can be (partially, but not completely) mitigated with the use of modern IT technologies, with the connection of the CBPP to a central server, as well as the daily participation of the general public giving feedback on the operation of such CBPP. In addition, statistics on traffic flows and freight vehicles cannot be collected with this method. Therefore, it is always recommended to combine the BTC with traffic meters to collect the data on freight traffic and total traffic flow required for effective infrastructure planning and management. In conclusion, this option is considered to be quite effective, and may be an alternative in case of limited funds available. In the event that a network of secure checkpoints for CPVCs is installed throughout the road network, this work can be done gradually during the upcoming road rehabilitation project. If such roadside sites are to be built separately and it is possible to establish posts on level ground (no need for complex earthworks), then financial costs must be

considered.

The construction of roadside sites for safe BCPs can be considered optional if it is possible to find sufficiently large even and flat areas (gas stations, parking, traffic police posts).

Organization of the work of the SPVCC, data analysis and control over their activities:

Equipping PPVC with the latest technology with connection to a central server for continuous monitoring, and purchasing 26 PPVC;

SPVGK should be adequately equipped and should be supervised to improve their performance;

The SSCs should increase the transparency of their work, report data to a central server, and rotate checkpoints frequently. At this stage, the general public can be involved to receive feedback and reports as an indicator of their performance.

With regard to PPVC, it should be noted that such capabilities for tracking vehicles (GPS tracking) and monitoring their work are available, but they have not yet been used.

All developed countries, as well as most developing countries, implement some form of axle load control on their national roads. The most popular systems around the world remain checkpoints with PPVC using manual penalty. Axle load control procedures also vary considerably, but more often than not, traffic police officers delegate axle load control to Road Administrations, which means stopping vehicles and issuing tickets.

PPVGK

The Axle Load Monitoring Teams are mobile axle load control teams that travel around the country and are equipped with portable scales ready to be installed on demand for manual axle load control.

Mobile scales always consist of the scale itself, a platform designed to allow smooth movement over the scale, and a small data processor (usually stored in a small box) equipped with analysis software and a receipt printer (Figure 5).

Such equipment is stored in a PPVGK vehicle (minivan, pickup truck). It should be noted that the BCPs must be equipped with GPS controllers, as well as a remote connection to the server, in order to collect data centrally, as well as determine the location of the vehicle and check the activities of the CCP. However, even though the PPVGK are inherently “mobile”, which means autonomy, it is in this method that the human factor plays its main role.

Despite this, mobile axle load control has been found useful and is still used in most countries for specific purposes:

1. Access to



Rice. 5. Mobile scales

Plots for mobile axle load control

The site for mobile axle load control must be carefully selected. It cannot be carried out anywhere for safe and accurate weighing.

For safety reasons and to ensure accurate measurements, it is common practice in Western countries to build small areas near roads for temporary parking of vehicles to control the axle load at selected locations. These areas can also be used as parking spaces for the rest of the time.

For site selection, it is important to ensure that:

1. correct sections of roads are determined;
2. You can examine the intensity of traffic in both directions;
3. aspects of road safety were considered;
4. No access to easy detours to avoid survey areas.

Ideally, the survey sites should be located on a clear section of the road with good visibility, as it is important to place road signs ahead so that cars can slow down and stop. As mentioned above, there are many different types of mobile axle load monitors, however the measurement position requirements are generally the same for all types. The weighing surface must be hard, smooth, and the gradient/slope must not exceed 2% to ensure adequate measurement accuracy.

Manual penalty

It is necessary to provide for the possibility of carrying out manual fines at the PPVC.

The manual fine procedure requires the permanent presence at the posts of qualified and accredited traffic police personnel who will be responsible for the selection of vehicles, the collection of fines and possible other sanctions (in some countries, unloading or prohibiting further passage of vehicles).

In table. Table 2 provides an analysis of the work of the PPVC, advantages, opportunities, disadvantages and risks.

Table 2. Analysis of the work of the PPVGC

Advantages:	Flaws:
<ul style="list-style-type: none"> - data processing directly in the system in accordance with the desired structure. Possibility to enter control bodies, personnel, vehicle license number and axle types; - in accordance with applicable laws, metrological standards, sanctioned for fines; -high accuracy; -mobility; 	<ul style="list-style-type: none"> - the category of the vehicle and its dimensions are not recognized; - inability to use the system to collect data on traffic intensity and composition of the traffic flow; - the need for the presence of the operator; - the danger of working on the side of the road; - Relatively complex installation process.
Capabilities:	Risks:
<ul style="list-style-type: none"> - the category of the vehicle and its dimensions are not recognized; - inability to use the system to collect data on traffic intensity and composition of the traffic flow; - the need for the presence of the operator; - the danger of working on the side of the road; 	<ul style="list-style-type: none"> - communication with the central server cannot be provided in all places; - not only new weighing equipment is required, but also a modern car, GPS tracking and central service for planning and monitoring the activities of the PPVC;

In connection with the foregoing and due to the insufficiency of the measures taken for the development of the VGK in the Republic of Uzbekistan, it seems necessary, in addition to the proposed 52 SVGK, to equip the territorial departments of the Committee on Roads of the SVGK (for example, based on the calculation of 2 for each territorial office - a total of 26) .

CONCLUSION

Currently, work is underway in the Republic of Uzbekistan to create a system of weight and dimensional control of vehicles that would allow for the inspection of cargo vehicles and ensure the collection of funds to compensate for damage caused to roads.

It is planned to deploy and operate 52 complexes of weight and size control, which is not enough to create a system and solve key problems of weight and size control, namely: improving road safety, reducing the number of places where accidents are concentrated, protecting public roads from overload, increasing their turnaround time throughout the network public highways of the country. In addition, this will lead to an increase in the load on public roads left without weight and size control.

Analyzed the requirements for PPVC which have a number of advantages in terms of mobility and do not require significant financial resources.

It is proposed to equip the regional territorial departments of the Committee of Automobile Roads under the Ministry of Transport of the Republic of Uzbekistan with the 52 planned for deployment.

Thus, it is necessary to develop the PPVC on the territory of the Republic of Uzbekistan and it is proposed:

one. Acquire 26 PPVCs and equip them with the territorial departments of the Committee for Automobile Roads under the Ministry of Transport of the Republic of Uzbekistan based on the calculation of 2 PPVCs for each territorial administration;

2. For this purpose it is necessary:

- to study the requirements and features of the issued PPVGK;
- on the basis of a minivan car, it is proposed to equip an experimental PPVGK;
- to study the work of an experimental PPVC in the territory of the Republic of Uzbekistan in order to gain experience in weight and dimensional control, to study the features of weight and dimensional control in the Republic of Uzbekistan, and to develop requirements for a promising PPVC.

3. At the same time, it is necessary to ensure the autonomous and independent operation of the PPVC in order to eliminate the human factor, which is especially important given the local realities in the regions of the Republic of Uzbekistan.

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