

EXISTING PROBLEMS OF ROAD-BUILDING AND THE WAYS OF ITS IMPROVEMENT IN THE REPUBLIC OF ARTSAKH

Tatevik VERDYAN

Ph.D., Senior lecturer, Shushi University of Technology

Tatev POGHOSOVA

Lecturer, Department of EEA at Shushi University of Technology

Karine SHINDYAN

Lecturer, Department of EEA at Shushi University of Technology

Key words: road-building, road surface, building codes, project, road infrastructures

Introduction: Road-building is one of the most important and basic spheres of building, which covers highways and urban roads designing, road reconstructions and maintenances. Moreover, road-building covers pavement tiles and installation of drainage systems. A characteristic feature of road construction is that its products - roads - all structures on them - are an integral part of road transport, which means its consumption is possible only when transported by road. [1]

Usually, road construction companies are engaged in specialized road-building, which undertake the tasks of organizing and managing complex and multi-stage works, the necessary construction materials and equipment acquisitions, constant monitoring and maintenance of the road condition. There are several types of roads based on its purpose, type of traffic, permissible speed and other factors. Based on these factors, the type of construction of each road and road surface is determined. In Artsakh, you can find roads of various purposes which were built by using different technologies, the most common of which is paved road.

Literature review: The design, construction, repair and maintenance of highways are carried out in accordance with the current building regulations. Coordination and approval of road projects and construction, commissioning of repair and maintenance and handing over, as well as the status of settlements on roads (with the exception of roads included in the list of public use), utilizing them, and the issues related to construction, repair, maintenance and financing are regulated by the legislation of the Republic of Artsakh. [2] Organizations performing design work, employees, road works, equipment for traffic management (road signs, traffic lights) and the rest of related works, in accordance with the established procedure, are coordinated with the State Road Authority.

Methodology: The methods of induction, deduction, analysis and comparison were used in the course of the research. The scientific basis for the study was the research and analysis conducted by Armenian-foreign researchers in this field. The information base

was the laws and legal acts of the Republic of Artsakh and Republic of Armenia, as well as information obtained from websites and other sources.

Scientific novelty: The conducted research works and analyses have led to a number of scientific results, the following of which can be considered a scientific novelty:

- Road infrastructures damaged by the war in the Republic of Artsakh have been identified and options for their reconstruction and repair have been suggested.
- The strategic importance of major repairs and reconstruction of interstate and intercommunal highways for 2020-2022 has been developed and suggested.
- The current problems in the field of road construction in the Republic of Artsakh are identified, and possibilities of the main directions for their solution are proposed.

Analysis: After the 44-day war, many built-in reconstructed roads have been under control of Azerbaijani, the construction of which was mainly carried out with the help of Hayastan All Armenian Fund and by state means.

In 2002, the 10-kilometer KarmirShuka-Hadrut road was completed. More than 1 billion AMD were invested in the construction. In 2011, the 11.2-kilometer Karmir-Shuka/Dzagouni-Hadrut road was constructed, Tsakuri-Hadrut road surfaces were repaired as a result of a total investment of 3 billion and 172 million AMD. The construction of the second road connecting Armenia with Artsakh, the Martakert-Vardenis highway, was one of the largest projects implemented in Artsakh. 17 billion 318 million 753 thousand AMD were allocated for the construction of a road with a length of 114.6 km. The highway opening took place in 2017. According to the declaration of November 9, 2020, Qarvachar region, through which a significant part of the highway passed, came under the control of Azerbaijan, as a result, Armenians now use only the section of the Martakert-Stepanakert road. During 2019 and 2020 the Hayastan All Armenian Fund allocated 719-6 million AMD for the construction of the Martakert-Mataghis highway.

Apart from the above, roads have been built and reconstructed in Shoushi, Hadrut, Ukhtadzor, Talysh and other settlements. Generally, more than 23 billion 385 million AMD were spent on the construction of roads only allocated by the Hayastan All Armenian Fund which came under the control of Azerbaijan, In 2020 the initial volume of road construction under the capital investment program was 3 billion 830 million 900 thousand AMD which increased by about 3 billion 854 million 600 thousand AMD, amounting to a total of 7 billion 985 million 500 thousand AMD. In the Republic of Artsakh, each settlement must have at least an automobile road connecting to the interstate highway system, provided with passability. In the

Republic of Artsakh, the main road construction companies engaged in asphaltting, construction and repair of roads are: “Caravan” LLC, “Veratsnund” LLC, “Kapavor” LLC, “Chan-shin” LLC, Virazh PC (Table 1). (AMD)

Table 1. The main road construction companies of the Republic of Artsakh and the cost of the work done by them. [3]

Road construction companies	From 2010 to 2022	From 2020 to 2022	From 2021 to 2023
“Caravan” LLC	4314,456	1758,96	2207,953
“Veratsnund” LLC	584,848	976,373	294,845
“Kapavor” LLC	-	2564,514	2029,169
“Chanshin” LLC	3369,102	453,077	1758,299
“Virazh” PC	1852,041	520,769	167,036

It is clear from the data in the table that the leading road construction company in the Republic of Artsakh for 10 years, from 2010 to 2020 is “Caravan” LLC. Its main competitor was “Chanshin” CJSC, which, however, was behind by 945.36 thousand drams. However, the post-war situation is different: Kapavor LLC, joining the road construction works, is ahead of the leader of the road construction market of Artsakh Republic, exceeding the volume of works by 805.55 thousand drams. At present, with the forecast for the next year, Caravan LLC will increase its workload again, returning to the leader of the road construction market in Artsakh Republic, but in the post-war period, “Chanshin” LLC has reduced its volumes by about 7 times, and has no tendency to return to its previous volumes. Thus, in 2010-2020, interstate-intercommunal roads were overhauled or reconstructed:

- ✓ ₴1204,449 thousand were spent on 8 km road from the M2 Interstate highway system of the Republic of Artsakh to Haterq village
- ✓ ₴295,081 thousand were spent on 3,4 km road from the M2 Interstate highway system of the Republic of Artsakh to Harutyunagomer village
- ✓ ₴447,845 thousand were spent on 3,3 km road from the M2 Interstate highway system of the Republic of Artsakh to Kochoghot village
- ✓ ₴85358 thousand were spent on 1 km road from Stepanakert-Vank highway to Arajadzor village of the Republic of Artsakh
- ✓ ₴272,614 thousand were spent on 3,6 km road from Stepanakert-Drmbon P1 highway to Khndzristan village of the Republic of Artsakh
- ✓ ₴2865,46 thousand were spent on the improvement of Azatamartikner Street of Martuni town
- ✓ ₴1002,513 thousand were spent on the improvement of Sakhqarov Street of Martakert town
- ✓ ₴616,157 thousand were spent on 4 km road from Vaghuhas village to Vardenis Martakert highway

- ✓ Դ117,249 thousand were spent on 4,6 km road from the P3highwayof T4-1KarmirShuka-Gishito Herher villagesof the Republic of Artsakh
- ✓ Դ87,186 thousand were spent on 1,2 km road from the P3 highwayof T4-1KarmirShuka-Gishi highway to Herher- Tsovategh- Kherkhan villages of the Republic of Artsakh
- ✓ Դ93,166 thousand were spent on 1,7 km road from the P3highwayofT4-1KarmirShuka-Gishito Tsovategh- Kherkhan villages of the Republic of Artsakh
- ✓ Դ67,773 thousand were spent on 0,6 km road from the P3highway ofT4-1KarmirShuka-Gishi to Herher villages of the Republic of Artsakh
- ✓ Դ147,024 thousand were spent on the main street improvement of Noragyugh village
- ✓ Դ861,17 thousand were spent on 7,9 km road from Stepanakert-Martuni highway to Berdashen village of the Republic of Artsakh
- ✓ Դ97,842 thousand were spent on 1 km road, from Stepanakert-Askeran highway to Berdadzor village of the Republic of Artsakh
- ✓ Դ241,632 thousand were spent on the improvement of NikolDuman street of Stepanakert town
- ✓ Դ72,450 thousand were spent on the improvement of the 2nd cul-de-sac of the courtyard of the apartment building N5 on Tigran Mets street of Stepanakert town of Republic of Artsakh
- ✓ Դ205,389 thousand were spent on the improvement of Magda Neyman street of Stepanakert town
- ✓ Դ849,528 thousand were spent on the improvement of Daniel-Bek Pirumyan cul-de-sac at the intersection of Vagharshyan street of Stepanakert town
- ✓ Դ145,670 thousand were spent on the improvement of the courtyards of the buildingsN52,N54,N56 on Sasuntsi David street of Stepanakert town

In 2019 the main organizations carrying out the above-mentioned road construction works were from the first 300 major taxpayers of Artsakh. [4]

Table 2: Amounts of taxes paid by road construction organizations

N	Company name:	Total	Direct taxes	Indirect taxes	Other taxes, duties, mandatory fees
1.	“Caravan” LLC	416 132,70	24 398,20	381 525,60	10 208,90
2.	“Virazh” PC	248 615,70	138 109,00	103 626,70	6 880,00
3.	“Kapavor” LLC	142 068,90	127 481,20	6 445,90	8 141,80
4.	“Chanshin” CJSC	84 414,80	46 020,80	35 809,20	2 584,80
5.	“Veratsnund” LLC	27 579,00	12 495,20	14 347,00	736,80

Since LLC "Caravan" is the leading organization in the Republic of Artsakh, it is the largest taxpayer in the Republic of Artsakh in this area. During 2020-2021 Artsakh restored the road infrastructure damaged due to the war. During the 44-day war, three

bridges were destroyed by enemy shelling, roads were damaged, and restoration work was completed. The bridges controlled by Artsakh such as the Getavan, Sousi and Aghavno bridges were damaged which are being reconstructed.

The border with Armenia from Stepanakert is served by the organization "Vahe Karapetyan", subordinate to the Ministry of Urban Development, which also carries out the construction of infrastructure: road construction, asphaltting, restoration of lighting. The Stepanakert-Goris highway, intercommunal roads are being asphalted, lighting is being restored. Thus, in 2020-2021, interstate-intercommunal roads have been repaired or reconstructed:

- ✓ ₴269,251 thousand were spent on 2 km road from the M2 Interstate highway system of the Republic of Artsakh to Verin Horatagh village.
- ✓ ₴182,474 thousand were spent on 1,6 km road from Martakert-Drmbon highway to Maghavuz village of the Republic of Artsakh.
- ✓ ₴105,811 thousand were spent on 1,2 km road from Haterk-Aknaberd highway to Zadakhach village of the Republic of Artsakh.
- ✓ ₴146,281 thousand were spent on 1,4 km road from Khndristan village to Hilis village of the Republic of Artsakh.
- ✓ ₴178,25 thousand were spent on the improvement of Avanesyan and Garegin Nzhdeh streets of Martuni town.
- ✓ ₴2564,514 thousand were spent on the M1 highway of Goris-Stepanakert-Askeran.
- ✓ ₴691,24 thousand were spent on 6,6 km road from Stepanakert to Lernavan, Aygestan highway of the Republic of Artsakh.
- ✓ ₴249,307 thousand were spent on 2,2 km road from the P3 highway of T4-1 Karmir Shuka-Gishi to Qecht villages of the Republic of Artsakh.
- ✓ ₴98,282 thousand were spent on the improvement of Noragyugh village streets which was 1,5 km.
- ✓ ₴156,335 thousand were spent on 1 km road from the Berdashen village to Ashan of the Republic of Artsakh.
- ✓ ₴520,769 thousand were spent on 4,4 km road from the Stepanakert Nngi, Martuni highways to Kaghartsi village of the Republic of Artsakh.
- ✓ ₴141,499 thousand were spent on the improvement of the courtyards of the apartment buildings N4 and N4bon Manukyan street of Stepanakert town.
- ✓ ₴212,35 thousand were spent on the improvement of streets sections of 20 Petrvari, Khachatryan, Spandaryan and Metaqsagortsaranner of Stepanakert town.
- ✓ 128,546 thousand were spent on the improvement of Gagarin streets of Stepanakert town.

- ✓ Դ967,854 thousand were spent on 7,9 km road from the M2 Stepanakert-Drmbonhighway to Astghashen - Patara villages of the Republic of Artsakh.
 - ✓ Դ464,732 thousand were spent on 5 km road from the M2 Stepanakert - Drmbonhighway to Dahrav villages of the Republic of Artsakh.
 - ✓ Դ1210,093 thousand were spent on 10 km road from Haterq village to Martakert - Drmbonhighway.
 - ✓ Դ628,784 thousand were spent on 4,5 km road from the T4-1 KarmirShukahighway to Tghavart village of the Republic of Artsakh.
 - ✓ Դ294,845 thousand were spent on 4,5 km road, from the P3 highway of T4-1 KarmirShuka-Gishi to Kolkhozashen village of the Republic of Artsakh.
 - ✓ Դ392,527 thousand were spent on the improvement of the 1st cul-de-sac on Baghramyan street of Stepanakert town.
 - ✓ Դ394,8 thousand were spent on the improvement of StepGES street, StepGES 1st alley and a part of StepGES 2nd alley of Stepanakert town.
 - ✓ Դ603,928 thousand were spent on the improvement of a part of alleys of Naberezhnaya and HovhannesLararev of Stepanakert town.
 - ✓ Դ759,571 thousand were spent on the improvement of HovhannesLazarev streets and its centers and 1st and 2nd Naberezhnaya alleys of Stepanakert town.
 - ✓ Դ997,86 thousand were spent on the improvement of GargeginNzhdeh, ArsenAmiryan, Hovhannes Shiraz, MarietaShahinyan streets and the dead-end streets and alleys of MarietaShahinyan of Stepanakert town.
 - ✓ Դ167,036 thousand were spent on the improvement of the courtyards of the residential buildings N30, N32, N34, N36, N44 on Vagharshyan street of Stepanakert town.
 - ✓ Դ204,056 thousand were spent on the improvement of this section between General Parsegov and V. Mamikonyan and Kamo streets of Stepanakert town.
- During 2021 and 2023 it is planned to:[3]
- ✓ Improvement of the road leading to Shahmasur village
 - ✓ Improvement of the road leading to Tsmakahogh village
 - ✓ Improvement of the road leading to Poghosagomer village
 - ✓ From Stepanakert-Nngi – Martuni highway to Paravatumb village of the Republic of Artsakh
 - ✓ From M2 Askeran district highway to Khramort village of Republic of Artsakh
 - ✓ Improvement of the courtyards of the apartment buildings N5, N7, N9, N11, N13, N15, on Isakov street and N56 on Azatamartikneri street of Stepanakert town
 - ✓ Improvement of General Parseghov street in Stepanakert town
 - ✓ Improvement of the courtyards of the buildings N121 and N123 on HovhannesTumanyan street of Stepanakert town
 - ✓ Improvement of the residential blocks of N187 apartment of Stepanakert town

- ✓ Improvement of the courtyards of 23 Stepanyan, 68 Nzhdeh and 28 Knunyats of Stepanakert town
- ✓ Improvement of Zarge quarters

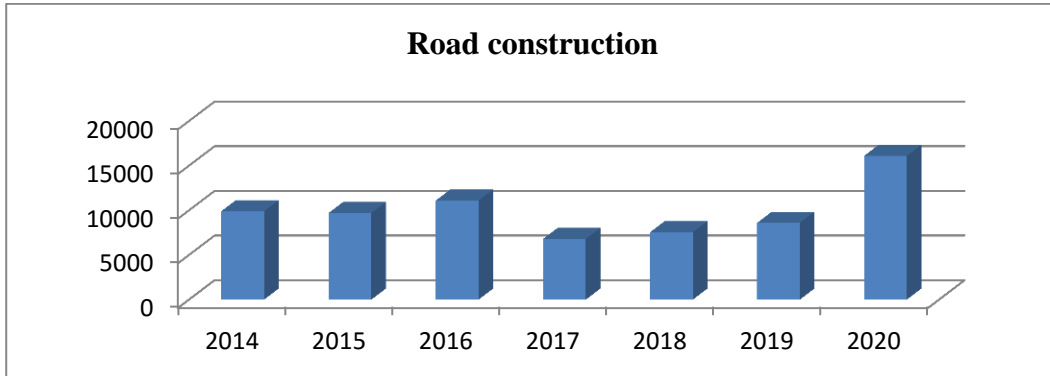


Chart 1. Dynamics of road construction of the Republic of Artsakh in 2014-2020 [5]

As can be seen from the diagram, the volume of road construction has increased compared to previous years, especially after the war, the road construction for Artsakh is of great importance both strategically and economically, which is directly under the control of the President of the Republic and the Government. Studies of the activities of road construction organizations of the Republic of Artsakh show that in 2010-2021 have been carried out works on the following costs: 8281,369 thousand AMD by LLC Caravan, 1856,066 thousand AMD by LLC Veratsnund, 4593,683 thousand AMD by LLC Kapavor, 5580,478 thousand AMD by CJSC Chanshin and 2539,846 thousand AMD by LLC Virazh.

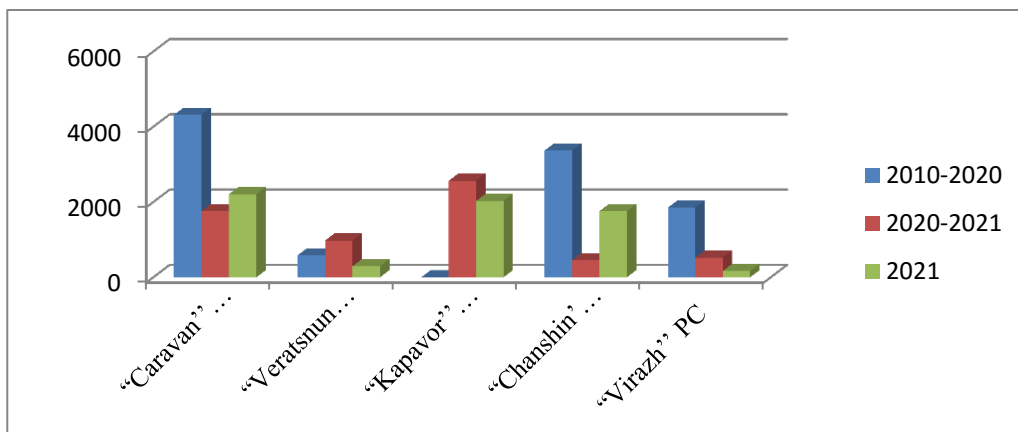


Chart 2. Dynamics of activities of road construction companies of the Republic of Artsakh during 2010-2021

Conclusions. Thus, we can say that in the Republic of Artsakh in the post-war period, programs for the elimination of the consequences of hostilities were launched by the Ministry of Urban Development of the Republic of Artsakh immediately after the end of the war. In the Republic of Artsakh, measures will be taken in road construction to organize the construction and operation of roads using new technologies. [6]

In 2021-2023, road improvement and asphalt works in the field of road construction are planned for the amount of 2078,296 thousand AMD.

To solve existing problems in the field, to improve the condition, we offer:

Currently there are no concrete roads in Artsakh, however, with the improvement of road construction companies and the use of the latest technologies, the option of concrete paving of roads becomes necessary, since concrete roads are extremely strong and durable, they can last for 30-40 years without repair, and there is a need for repairs at least 10-12 years after the construction of the road, the costs incurred will be justified.

Ensuring access to informational interconnection, information, accessibility of road construction works, programs, and current results.

References

1. forumshoes.ru –Janaparhnerishinararutyunevspasarkum
2. nankr.am
3. AHqaxaqashinutyannaxararutyun
4. https://hetq.am/hy/article/120684?fbclid=IwAR16dgUoyGifI7nNGknpYntPQfZjuns_oVF0Qkkd728x_4O8OUYa1OuPldV0
5. Artsakhivijakagrakantaregirq 2014-2020թթ.,www.stat-nkr.am
6. 2021t.pet.byujeinaxagic ,2021t.«Byuj. uxert», Stepanakert,2020t.ej 8

Tatevik VERDYAN, Tatev POGHOSOVA, Karine SHINDYAN **Existing problems of road-building and its improvements in the Republic of Artsakh**

Key words: road-building, road surface, building codes, project, road infrastructure

The construction of roads is of great strategic and economic importance for the Republic of Artsakh. It is obvious that the war in Artsakh caused quite serious damage to various roads and adjacent infrastructure, the restoration of which, in addition to the urban component, also has a serious security component. Repair, rehabilitation and asphalt works of all intercommunal roads as a whole with ensuring passability of at least one road connecting each locality with the interstate road network is very important, which should be under the attention of the Government of the Republic of Artsakh.