

# ENGINEER



international scientific journal

**ISSUE**

4, 2024 Vol. 2

**ISSN**

3030-3893



SLIB.UZ  
Scientific library of Uzbekistan



A bridge between science and innovation



**TOSHKENT DAVLAT  
TRANSPORT UNIVERSITETI**

Tashkent state  
transport university



# ENGINEER

A bridge between science and innovation

**ISSN 3030-3893**

**VOLUME 2, ISSUE 4**

**DECEMBER, 2024**



[engineer.tstu.uz](http://engineer.tstu.uz)

# TASHKENT STATE TRANSPORT UNIVERSITY

## ENGINEER

INTERNATIONAL SCIENTIFIC JOURNAL  
VOLUME 2, ISSUE 4 DECEMBER, 2024

### EDITOR-IN-CHIEF

**SAID S. SHAUMAROV**

*Professor, Doctor of Sciences in Technics, Tashkent State Transport University*

### Deputy Chief Editor

**Miraziz M. Talipov**

*Doctor of Philosophy in Technical Sciences, Tashkent State Transport University*

---

Founder of the international scientific journal “Engineer” – Tashkent State Transport University, 100167, Republic of Uzbekistan, Tashkent, Temiryo‘lchilar str., 1, office: 465, e-mail: publication@tstu.uz.

The “Engineer” publishes the most significant results of scientific and applied research carried out in universities of transport profile, as well as other higher educational institutions, research institutes, and centers of the Republic of Uzbekistan and foreign countries.

The journal is published 4 times a year and contains publications in the following main areas:

- Engineering;
- General Engineering;
- Aerospace Engineering;
- Automotive Engineering;
- Civil and Structural Engineering;
- Computational Mechanics;
- Control and Systems Engineering;
- Electrical and Electronic Engineering;
- Industrial and Manufacturing Engineering;
- Mechanical Engineering;
- Mechanics of Materials;
- Safety, Risk, Reliability and Quality;
- Media Technology;
- Building and Construction;
- Architecture.

---

Tashkent State Transport University had the opportunity to publish the international scientific journal “Engineer” based on the **Certificate No. 1183** of the Information and Mass Communications Agency under the Administration of the President of the Republic of Uzbekistan. **ISSN 3030-3893**. Articles in the journal are published in English language.

3	
engineer.tstu.uz	A bridge between science and innovation

## Program evaluation of the enterprise exploitation service process

I.I. Umirov<sup>1</sup> 

<sup>1</sup>Jizzakh Polytechnic Institute, Jizzakh, Uzbekistan

**Abstract:** In this article, the industrial infrastructure, first of all, the developed system of roads and railways, their effective functioning is an important condition and factor in reducing the total production costs. This, in turn, enhances the competitiveness of the products and the economy as a whole. In order to ensure the accelerated development of modern production and social infrastructure, and to create favorable conditions for the consistent and sustainable economic growth, a special program "On Additional Measures for Further Development of Production and Social Infrastructure in 2019" was adopted and its implementation under strict control. It is desirable to determine the annual production program for the enterprise and using the coefficients of automobile, in this way with the accounting of technical preparation coefficients. Inadequate points of equipment for the lack of conditions for the complete performance of technological processes in the regions and workshops at the enterprise. Should improve the exploitation service at the enterprise. This paper provides designing methodical recommendations and using there results to improve traffic safety in transport.

**Keywords:** car, traffic safety, traffic, traffic signs, dangerous site

### 1. Introduction

Deep transformations, gradual reform and liberalization of all aspects of political and socio-economical life, democratic renewal and modernization of our society are being rapidly developed in our country. The next priority is further development of production and social infrastructure as an important factor of modernization of the country and increasing employment.

Special attention should be given to this priority, which is of utmost importance. There are several reasons.

First, the development of infrastructure will create the necessary conditions for the establishment of new enterprises and development of the economy as a whole, as well as the opportunities for the development of the country's rich mineral resources.

Secondly, the industrial infrastructure, first of all, the developed system of roads [6] and railways, their effective functioning is an important condition and factor in reducing the total production costs. This, in turn, enhances the competitiveness of the products and the economy [3] as a whole.

Thirdly, the development of social infrastructure, provision of the population with clean drinking water, energy, the construction of social facilities and, ultimately, improvement of living standards.

Fourth, infrastructure development is a labor-intensive industry. This will create new jobs, provide employment to the population, especially young people, and increase the incomes and welfare of the people.

The rapid development of passenger cars worldwide in Uzbekistan, with the need to increase the technical rigidity and culture of driving cars, necessitates the creation of a comprehensive network of technical service [4] zones. Many organizations and enterprises in the country are involved in projects of technical service zones.

However, no technical literature has been developed to cover all aspects of TSS yet. This disadvantage, in turn, has a significant impact on the quality and performance of the

work, due to the variety of equipment, despite their generalities. Many car service stations have been designed and used in the global [5] automotive industry.

This article covers the development of new projects of automotive maintenance stations, summarizing their economic and manufacturing processes, taking into account the experience gained in the field of automotive industry.

### 2. Research methodology

The main purpose of the article is to summarize the design process for the maintenance areas and make recommendations for their efficient use. It provides a feasibility study of the technologies and their technical performance.

In order to ensure the accelerated development of modern production and social infrastructure, and to create favorable conditions for the consistent and sustainable economic growth, a special program "On Additional Measures for Further Development of Production and Social Infrastructure in 2019" was adopted and its implementation under strict control.

Effective operation of the motor transport enterprise is a combination of the efficient operation of working posts in the production regions and workshops. To this end, technological development needs to be assessed in order to further develop the social infrastructure of motor transport enterprises.

The ATC assesses the annual production program using a variety of methods, depending on the impact level. That is, using cycles, rapid computational and computational methods.

### 3. Result and Discussion

At the same time, the calculator is calculated based on the aggregate data for calculating the daily production volume of the rolling stock at the enterprise (volume of transportation, total annual transportation):

 <https://orcid.org/0000-0003-2329-2256>



It is desirable to determine the annual production program for the enterprise  $\alpha_f$  using the coefficients of automobile, in this  $\alpha_T$  with the accounting of technical preparation coefficients.

$$\alpha_i = \frac{D_T \cdot \alpha_T}{D_c} \quad (1)$$

In this regard, it is necessary to take into account the annual production volume of the rolling stock in ATC.

Carrying out an assessment of the composition of the vehicles involved in the transport of vehicles by the coefficient of use of cars in scientific terms is as follows;

$$Q_{year} = Q_{day} 361 \cdot \alpha_f = \frac{T_N \cdot \theta_T \cdot \beta \cdot q \cdot \gamma_c}{L_{day} + E_{ot} \cdot \theta_T \cdot \beta} \cdot 361 \quad (2)$$

Here is;  $Q_{year}$  – daily traffic amount

$T_N$  – time in work

$\theta_T$  – technical speed

$\beta$  – using distance coefficient.

$q$  – nominal load capacity.

$\gamma_c$  – use of cargo handling capacity.

$L_{day}$  – daily walking distance.

$E_{ot}$  – overloading time.

According to this assessment, annual transportation  $\alpha_f$  is related to the use of in-house car ratios.

In order to calculate  $\alpha_f$  the ratio of use of in-house vehicles, it is necessary to  $\alpha_T$ . First evaluate the technical readiness ratio according to operating conditions:

$$\alpha_T = \frac{1}{1 + L_d \left( \frac{d}{1000} + \frac{D_c}{L_{cr}} \right)} \quad (3)$$

The evaluation process should be based on the total cost of car maintenance and the total annual maintenance;

You should first take into account the annual distance for your product.

$$EL = A_i \cdot L_d \cdot 365 \cdot \alpha_i \quad (4)$$

Here is:  $A_i$  – number of automobiles

Expression studies were performed on the example of auto-assembling No. 11 at Marjanbulak gold-ore deposit in Gallaaral district.

Particularly in it: the automobiles [1, 7] in enterprises  $A_i = 75$

Identified the normal amount of walking distance to full repair  $L_{cr} = 520000 \text{ km}$  the amount of heavy conditions  $L_{cr} = 385000 \text{ km}$ .

1- TS distance  $L_1 = 3000 \text{ km}$

2- TS distance  $L_2 = 10000 \text{ km}$

Daily walking distance  $L_D = 210 \text{ km}$

Comparison dates of automobiles 2-TS and CR  $d = 0.315 \text{ days}$  DR=24 day enterprises working day 305.

These information were taken for the exploitation condition from the experimental research center MAHSERVIS in Jizzakh city, Sharof Rashidov street. The calculation for the whole enterprise is made as follows.

$$N_{c1} = \frac{L_{cr}}{L_{c1}} = \frac{385000}{385000} = 1 \quad (5)$$

$$N_2 = \frac{L_{cr}}{L_2} - N_{cr} = \frac{386000}{10000} - 1 = 38.5 - 37 \quad (6)$$

$$N_1 = \frac{L_{c1}}{L_1} = N_{yer} - N_2 = \frac{386000}{3000} - 1 - 37 = 90 \quad (7)$$

$$N_{dc} = \frac{L_{cr}}{L_{dr}} = \frac{386000}{25000} = 1540 \quad (8)$$

$$D_{7K} = \frac{L_{cr}}{L_{dr}} = \frac{386000}{250} = 1540 \quad (9)$$

During the cycle standing days in 2-TS, CR and DR

$$D_T = \frac{L_{LUT}}{1000} D_{cr.te} \cdot N_{XE} = \frac{0.315 \cdot 386000}{1000} + 24 \cdot 1 = 145 \text{ day} \quad (10)$$

$$\alpha_T = \frac{D_E}{D_E + D_T} = \frac{1540}{1540 + 141} = 0.91$$

According to the calculation the automobiles in enterprises  $\alpha_T$ -Technical preparation coefficient of vehicles in the company is calculated for the exploitation condition for the company as follows:

$$\alpha_T = \frac{1}{1 + L_{dr} \left( \frac{d_2 \cdot K_2 + d_{dr} \cdot K_{cr}}{10000} + \frac{D_{cr}(\eta_{u-1})}{L_{cr} \eta_i} \right)} \quad (11)$$

Here is:  $d_{2n} d_{pr} \cdot 2 - TS$  ba CR Comparing days

$$d_2 = \frac{D_2 \cdot 1000}{L_2} \text{ day} / 1000 \text{ km} \quad (12)$$

$$d_{cr} = d - d_2 \text{ day} / 1000 \text{ km} \quad (13)$$

d-2-TS and in CR normative general comparing days

$$d = d^h \cdot k_y \quad (14)$$

for quarry  $d^h = 0.1 \text{ day} / 1000 \text{ km}$  coefficient of correction  $K_i = 1.26$   $d = 0.5 \cdot 1.26 = 0.63 \text{ k} / 1000 \text{ km}$

$$d_2 = \frac{1 \cdot 1000}{10000} = 0.1 \text{ k} / 1000 \text{ km}$$

$$d_{cr} = 0.63 - 0.1 = 0.53 \text{ k} / 1000 \text{ km}$$

$K_2$  The coefficient that takes into account the type of movement is equal  $K_2 = 2.011$  for the Gallaaral quarry.

$K_{CR}$  – Current repairing works volume that takes into account coefficient  $K_{CR} = 0.5$

According to above mentioned information  $\alpha_T$ -technical preparation coefficient is determined.

$$\alpha_i = \frac{1}{1 + 250 \left( \frac{0.1 \cdot 2.05 + 0.53 \cdot 0.5}{1000} + \frac{24(2-1)}{386000} \right)} = 0.88$$

As it is seen from the calculation,  $\alpha_i = 0.88$ , it is necessary to revise the normative parameters for the enterprise in order to improve the expropriation service at the enterprise. Depending on the ratio of  $\alpha_i$ -technical readiness to use in cars, the ratio of coefficients is determined as follows.

$$\alpha_i = \frac{D_y}{D_{cy}} \cdot \alpha_T \cdot K_i \quad (14)$$

Here is:  $K_i$  – is the coefficient for the reduction due to technical problems with the use of vehicles under the conditions of expropriation.

$$1. \quad K_i = \frac{D_{EY}}{D_Y \cdot \alpha_T} \quad (15)$$

Here is:  $D_{EY}$  – annual exploitation days.

ATC for specific excretion conditions is calculated as follows:

$$K_i = \frac{D_{EO}}{D_i \cdot \alpha_T} = \frac{301}{301 \cdot 0.88} = 1.13$$

$$K_i = \frac{301}{301 \cdot 0.91} = 1.10$$

For the real condition of enterprise

$$\alpha_i = \frac{301}{301} \cdot 0.88 \cdot 1.13 = 0.830$$

During cycle for the condition of enterprise

$$\alpha_i = \frac{301}{301} \cdot 0.91 \cdot 1.1 = 0.836$$

In terms of operating environment at the enterprise

$$\alpha_i = \frac{D_Y}{D_K} \cdot \alpha_T = \frac{301}{301} \cdot 0.88 = 0.73$$

## 4. Conclusion

In conclusion, it should be noted that for the enterprise, the same type of cars  $\alpha_i = 0.73$ ,  $\alpha_i = 0.830$ ,  $\alpha_i = 0.836$ , can be interpreted as:

1. Due to non-conformity of operation requirements of DTC



2.  $A_i = 75$  per day the technical parameters of  $A_i=62$  correspond to technical parameters, while,  $A_i = 13$ , exactly 17% of the vehicle is not technically ready for work;

3. Inadequate points of equipment for the lack of conditions for the complete performance of technological processes in the regions and workshops at the enterprise.

4. Should improve the exploitation service at the enterprise.

## References

[1] Sidiknazarova K.M. 2008. Technical exploitation of automobiles, course-book. -Tashkent: «VORIS-NASHRIYOT», 560.

[2] Thomas Chesney, Keith Evans, Stefan Gold, Alexander Trautrim. 2019. Understanding labour exploitation in the Spanish agricultural sector using an agent based approach. Journal of Cleaner Production. Volume 214, P.696-704. <https://doi.org/10.1016/j.jclepro.2018.12.282>.

[3] Kolasinska-Morawska, Katarzyna & Sułkowski, Łukasz & Morawski, Pawel. 2019. New Technologies in Transport in the face of challenges of Economy 4.0. Scientific Journal of Silesian University of Technology. Series Transport. 102. 73-83. 10.20858/sjsutst.2019.102.6.

[4] Adilov O.K, Mamayeva L.M, Xoshimova Sh, Adilov J Improving the work of HK in Service station. Samarkand Institute of Architecture and Construction

Architectural and Construction Problems. Scientific and technical journal. Issue 3, 2017, pages 104-106.

[5] Blandine Laperche, Gilliane Lefebvre, Denis Langlet. 2011. Innovation strategies of industrial groups in the global crisis: Rationalization and new paths. Technological Forecasting and Social Change. Volume 78, Issue 8, P.1319-1331. <https://doi.org/10.1016/j.techfore.2011.03.005>.

[6] Ismayilov, K., & Karimova, K. (2020). Application of used automobile tires granules for road construction in Uzbekistan. Journal of Critical Reviews, 7(12), 946-948.

[7] Kubaymurat, I., & Gulomovna, K. K. (2019). The Impact of Automobile Tires on the Environment from the Period of Raw Materials to the Disposal of Them. International Journal of Recent Technology and Engineering, 8(3), 1929-1931.

## Information about the author

**Umirov  
Ilhom**

Jizzakh polytechnic institute, Associate  
Professor of the Department of Vehicle  
Engineering, (PhD)

E-mail: [umirovilhom150@gmail.com](mailto:umirovilhom150@gmail.com)

Tel.: +998 97 326 47 47

<https://orcid.org/0000-0003-2329-2256>



<b>O. Ishnazarov, Kh. Khaydarov</b> <i>Enhancing energy efficiency in industrial pump units: the role of asynchronous motors with frequency converters .....</i>	<b>7</b>
<b>Sh. Ismoilov</b> <i>Functions of the Operation of Continuous Automatic Locomotive Signaling in Rail Transport (ALSN) .....</i>	<b>15</b>
<b>N. Aripov, Sh. Ismoilov</b> <i>Features of the effect of increased reverse traction currents on rail circuits and continuous automatic locomotive signaling.....</i>	<b>18</b>
<b>S. Absattarov, N. Tursunov</b> <i>The influence of the chemical composition, including harmful and undesirable impurities, on the properties of spring steels .....</i>	<b>21</b>
<b>K. Azizov, A. Beketov</b> <i>Analysis of existing methods for measurement of air pollution in road areas.....</i>	<b>24</b>
<b>D. Odilov</b> <i>The practical importance of the Maple software.....</i>	<b>28</b>
<b>I. Umirov</b> <i>Program evaluation of the enterprise exploitation service process.....</i>	<b>31</b>
<b>R. Saydakhmedov, O. Rustamov</b> <i>Increasing the role of titanium alloys in the aviation industry: problems and solutions .....</i>	<b>34</b>
<b>I. Normatov</b> <i>Bibliometric analysis of improving the performance system of human .....</i>	<b>37</b>
<b>T. Kurbaniyazov, A. Bazarbaev</b> <i>Modeling the processes of conversion of asymmetrical three-phase currents into output voltage.....</i>	<b>40</b>
<b>K. Azizov, A. Beketov</b> <i>Traffic flow characteristics and their impact on air pollution in urban streets: a case study of Tashkent .....</i>	<b>43</b>
<b>M. Ergashova, Sh. Khalimova, A. Normukhammadov</b> <i>State control in monitoring the greening of city roads and streets .....</i>	<b>46</b>
<b>O. Khushvaktov, Sh. Khalimova</b> <i>Traffic flow velocity analysis on urban roads: a study of Uzbekistan's key transportation route .....</i>	<b>49</b>
<b>Z. Alimova, S. Pulatov</b> <i>Performance analysis of motor oil quality in heavily loaded engines of quarry vehicles .....</i>	<b>53</b>
<b>M. Umarova</b> <i>Impact of the greened area of the enterprise on the safety of workers.....</i>	<b>58</b>
<b>D. Nazhenov, M. Masharipov, B. Rustamjonov, O. Pokrovskaya</b> <i>The impact of attracting an additional shunting locomotive to railway technical stations on the utilization indicators of rolling stock.....</i>	<b>61</b>
<b>Sh. Kayumov, A. Bashirova</b> <i>Improvement of the technology for determining the time spent on cleaning gondola cars.....</i>	<b>64</b>