

EDA 2024

**14. EUROPEAN SCIENTIFIC PRACTICAL CONFERENCE ON
INNOVATION IN STRATEGICAL PLANNING, CIVIL ENGINEERING,
ARCHITECTURE, INDUSTRIAL COOPERATION,
INTELLIGENT EUROPEAN CITIES, EU FUNDS AND BUSSINES DEVELOPMENT
EU 2030 - BEST KEYS FOR APLICATION**

Všechná autorská práva
autorů příspěvků vyhrazena.
Kopírování a další reprodukce
tohoto nosiče je zakázáno a řídí
se zákonem o autorských právech.

**SEPTEMBER 17.-18, 2024
EMBASSY OF THE
SLOVAK REPUBLIC IN SOFIA**

Příspěvky neprošli redakcí.
Vydáno pro účastníky konference
EDA 2024 - DVD katalog příspěvků
Nepronajímá se | Copyright © 2024
Zdravko Rusev - EUROARCH
All right reserved

ISBN: 978-80-87159-60-6



DVD CATALOGUE

**40. EURÓPSKE FÓRUM VISEGRAD 4+
PROGRAM EDA PROJEKT EDA 2024**
14. EURÓPSKA VEDECKO-PRAKTICKÁ KONFERENCIA
INOVATÍVNE STRATEGICKÉ PLÁNOVANIE, STAVEBNÉ INŽINIERSTVO, ARCHITEKTÚRA, INDUSTRIÁLNA
KOOPERÁCIA,
INTELIGENTNÉ EURÓPSKE MESTÁ, FONDY EÚ A OBCHODNÝ ROZVOJ - EÚ 2030
17.- 18. SEPTEMBRA 2024 SOFIA BULHARSKO

**40. EVROPSKÉ FÓRUM VISEGRAD 4+
PROGRAM EDA PROJEKT EDA 2024**
14. EVROPSKÁ VĚDECKOPRAKTICKÁ KONFERENCE
INOVATIVNÍ STRATEGICKÉ PLÁNOVÁNÍ, STAVEBNÍ INŽENÝRSTVÍ, ARCHITEKTURA, INDUSTRIÁLNÍ
KOOPERACE,
INTELIGENTNÍ EVROPSKÁ MĚSTA, FONDY EU A OBCHODNÍ ROZVOJ - EU 2030
17.- 18. ZÁŘÍ 2024 SOFIA BULHARSKO

**40. FORUM EUROPEJSKIE VISEGRAD 4+
PROGRAM EDA 2024**
14. EUROPEJSKA KONFERENCJA NAUKOWA NA TEMAT
INNOWACJI W PLANOWANIU STRATEGICZNYM, INŻYNIERII ŁADOWEJ, ARCHITEKTURZE, WSPÓŁPRACY
PRZEMYSŁOWEJ,
INTELIGENTNYCH MIASTA EUROPEJSKICH, FUNDUSZY UE I ROZWOJU BIZNESU - UE 2030
17-18 WRZEŚNIA 2024 SOFIA BUŁGARIA

**40. EUROPEAN FORUM VISEGRAD 4+
PROGRAM EDA 2024**
14. EUROPEAN SCIENTIFIC PRACTICAL CONFERENCE ON
INNOVATION IN STRATEGICAL PLANNING, CIVIL ENGINEERING, ARCHITECTURE, INDUSTRIAL
COOPERATION,
INTELLIGENT EUROPEAN CITIES, EU FUNDS AND BUSSINES DEVELOPMENT - EU 2030
(BEST KEYS FOR APLICATION)
SEPTEMBER 17.-18, 2024 SOFIA BULGARIA

ΦΟΡΥΜ ΕΔΑ 2024 **FORUM EDA 2024**

**ZÁŠTITA NAD KONFERENCIU
POD PATRONATEM
POD ZÁŠTITU
ПОД ПАТРОНАЖА НА
UNDER AUSPICES OF**



Velvyslanectví České republiky v Sofii



J. E. Ing. Miroslav Toman
Mimořádný a zplnomocněný velvyslanec České republiky v Bulharské republice
H. E. Ing. Miroslav Toman
Ambassador of the Czech Republic to the Republic of Bulgaria



VELVYSLANECTVO
SLOVENSKEJ REPUBLIKY
V PRAHE

Ľuboš Moravčík
 Slovak Chamber of Civil Engineers, Slovak Republic
 Grzegorz Sierpiński
 Silesian University of Technology, Poland
 Aleksander Śładkowski
 Silesian University of Technology, Poland
 Gábor Szöllösy
 Budapest and Pest County Chamber of Engineers, Hungaria
 Stoyo Todorov
 UACG, Bulgaria
 Roman Vodný
 Ministry of Regional Development of the Czech Republic
 Zdravko Rusev (Head of ISC)
 European Academy of Architecture, Czech Republic
 Małgorzata Urbańska-Turecek
 Ministerstwo Inwestycji i Rozwoju, Poland

(в азбучен ред, без титли и звания/in alphabetical order without title)

ISBN: 978-80-87159-60-6

PROGRAM

I.

ОТКРИВАНЕ НА КОНФЕРЕНЦИЯТА
ZAHÁJENIE KONFERENCIE
ZAHÁJENÍ KONFERENCE
OPENING OF THE CONFERENCE
17.09.2024
Embassy of the Slovak Republic
to the Republic of Bulgaria



Daniel Orszag

**Welcome from the name of Embassy of the Slovak Republic
in Sofia**

OPENING OF THE CONFERENCE



Anna Janiszewska-Frańczek,
Embassy of the Republic of Poland in Sofia

TAROSI c.s., s.r.o.
Slovak Republic



Подобряване на градската инфраструктура чрез осъществяване на комуникационни връзки на различни нива съчетани с интермодалност между различните транспортни системи

Transportno-комуникационен подлез под жп арел Пловдив
Improvement of urban infrastructure by implementing communication links at different levels combined with intermodality between different transport systems
Transport and communication underpass under railway area Plovdiv

Manyo Manev

BIAS-M Ltd, Bulgaria
Bulgaria



Analiza wpływu czynników społeczno-ekonomicznych na liczbę pasażerów kolei w Taszkencie
Analyzing Socio-Economic Factors Impacts on Rail Passenger Volume in Tashkent

Komil Turaev, Aleksander Śladkowski

Uzbekistan, Poland



Zavádění metody BIM v České republice
BIM Implementation in the Czech Republic

Leoš Svoboda

Ministerstvo průmyslu a obchodu České republiky
Ministry of Industry and Trade of the Czech Republic
(Conference proceedings)

(без титли и звания/without title)

VIII. KEY V4 SPECIAL PARTNERS AND GUESTS

Special partners and guests



14. EUROPEAN SCIENTIFIC PRACTICAL CONFERENCE ON INNOVATION IN STRATEGICAL PLANING, CIVIL ENGINEERING, ARCHITECTURE, INDUSTRIAL COOPERATION, INTELLIGENT EUROPEAN CITIES, EU FUNDS AND BUSSINES DEVELOPMENT - EU 2030, BEST KEYS FOR APPLICATION SEPTEMBER 17-18, 2024 - SOFIA, BULGARIA



Velvyslanectví České republiky v Sofii



Analyzing socio-economic factors impacts on rail passenger volume in Tashkent

Komil Turaev
Aleksander Śladkowski



Silesian
University
of Technology



**RESEARCH
UNIVERSITY**
EXCELLENCE INITIATIVE
Ministry of Science
and Higher Education

Analyzing socio-economic factors impacts
on rail passenger volume in Tashkent

Komil Turaev
Aleksander Śładkowski

Historical context - Tashkent's 1966 earthquake

The 1966 Tashkent earthquake occurred on 26 April in the Uzbek SSR destroying most of the buildings in the city, killing between 15 and 200 people and leaving between 200,000 and 300,000 homeless.



Historical context - rebuilding of Tashkent

In 1970, the Soviet republics and other countries provided aid to rebuild Tashkent as a model Soviet city with wide streets, parks, monuments, and apartment blocks

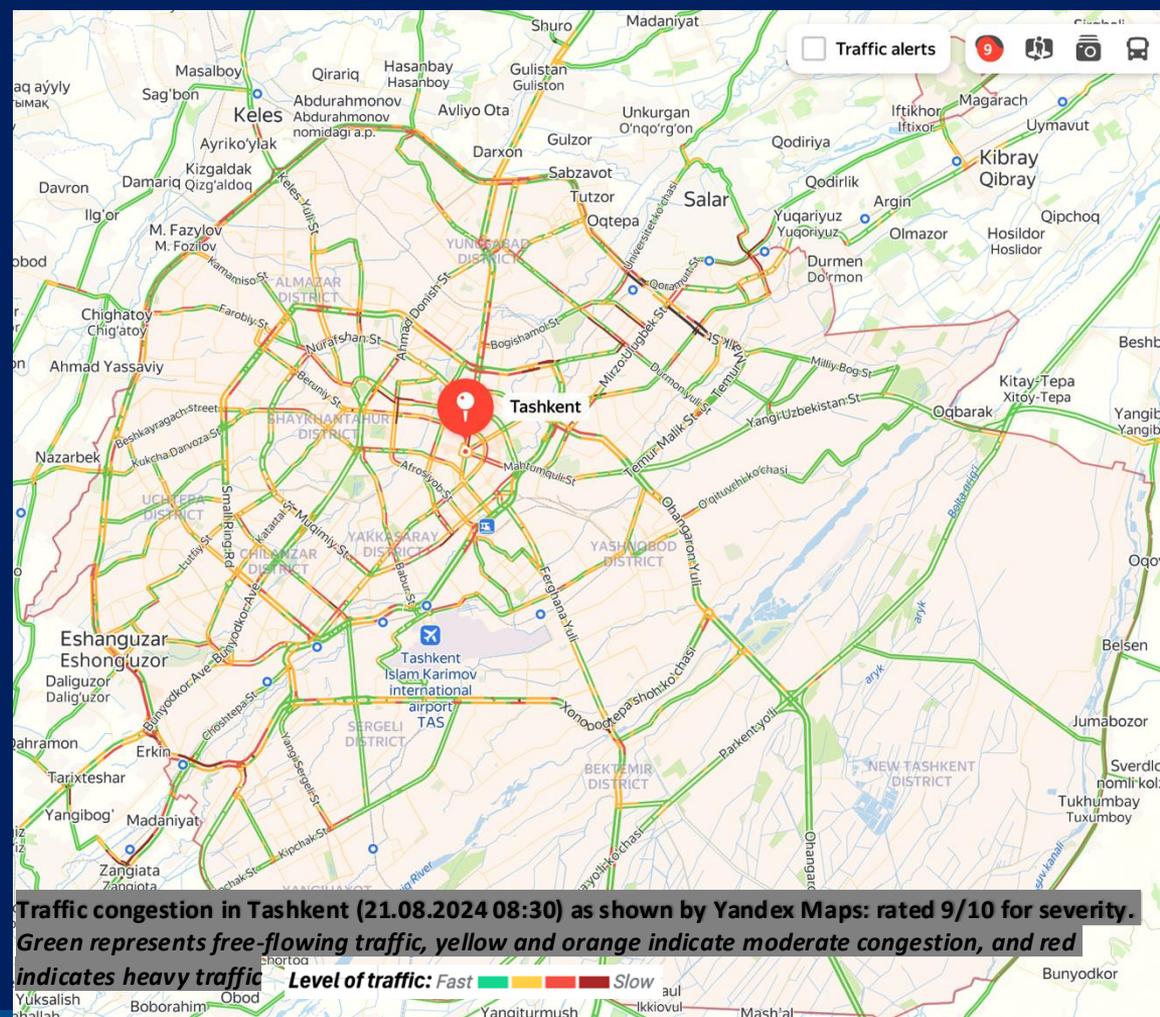


Rapidly growing Tashkent

The Ministry of Transport of Uzbekistan estimates that the city's population makes approximately 6 million trips daily.

Out of these trips:

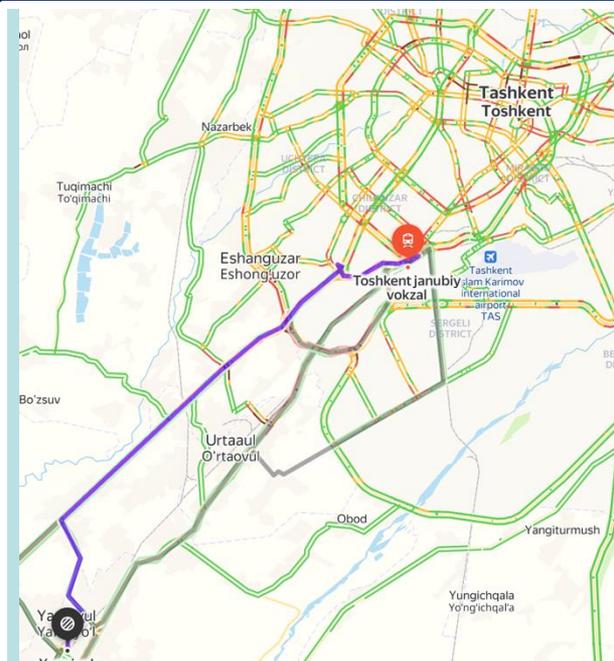
- 1.4 million are made using buses, minibuses, and the metro;
- 4.6 million are handled by the 800,000 private vehicles currently operating on the capital's roads;
- Private vehicles entering from surrounding areas – 165,000;
- Population of the capital grows by 100,000 people annually;
- Number of vehicles increases by 71,000 units annually (as of 2022)



Tashkent city inbound trips from surrounding areas

The expansion of Tashkent and its surrounding conglomerate, particularly following the independence from the Soviet Union, has led to significant growth in the railway sector. Currently, three railway lines connect Tashkent with its surrounding areas.

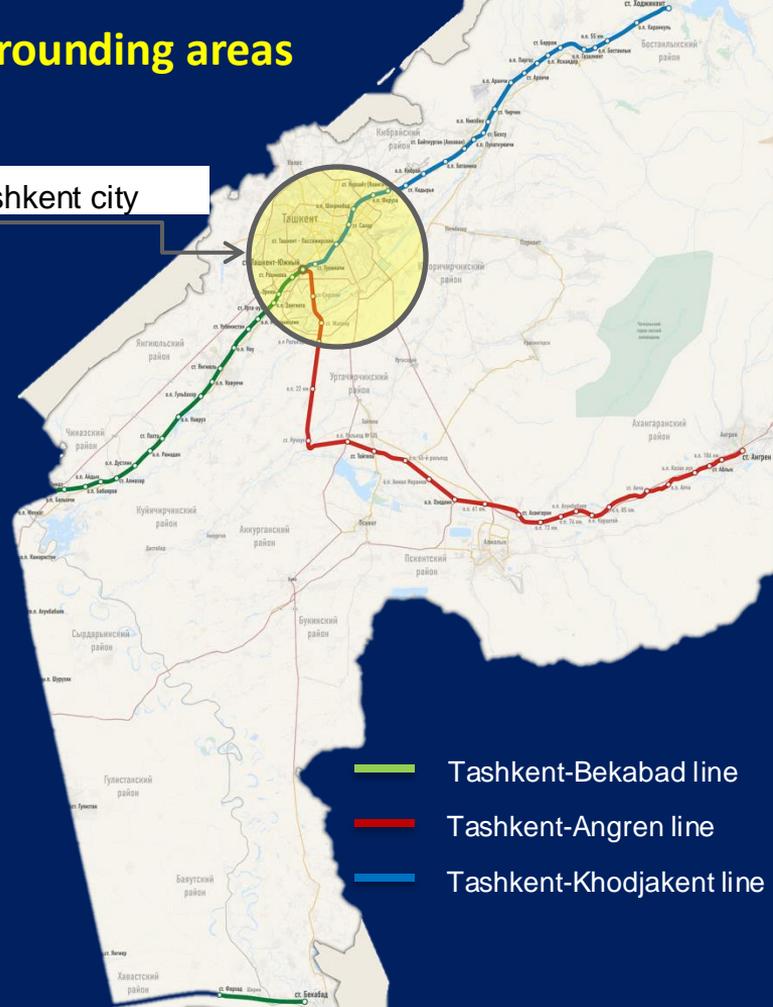
Tashkent city



Yangiyul – Tashkent South Station (Tashkent –Bakadab railway line)

- By train: 25-37 mins
- By car: 1 hour 10 min

The trips have been recorded using YANDEX MAPS services for the common destinations on a typical morning of a weekday (21 August 2024. 8.30 AM)

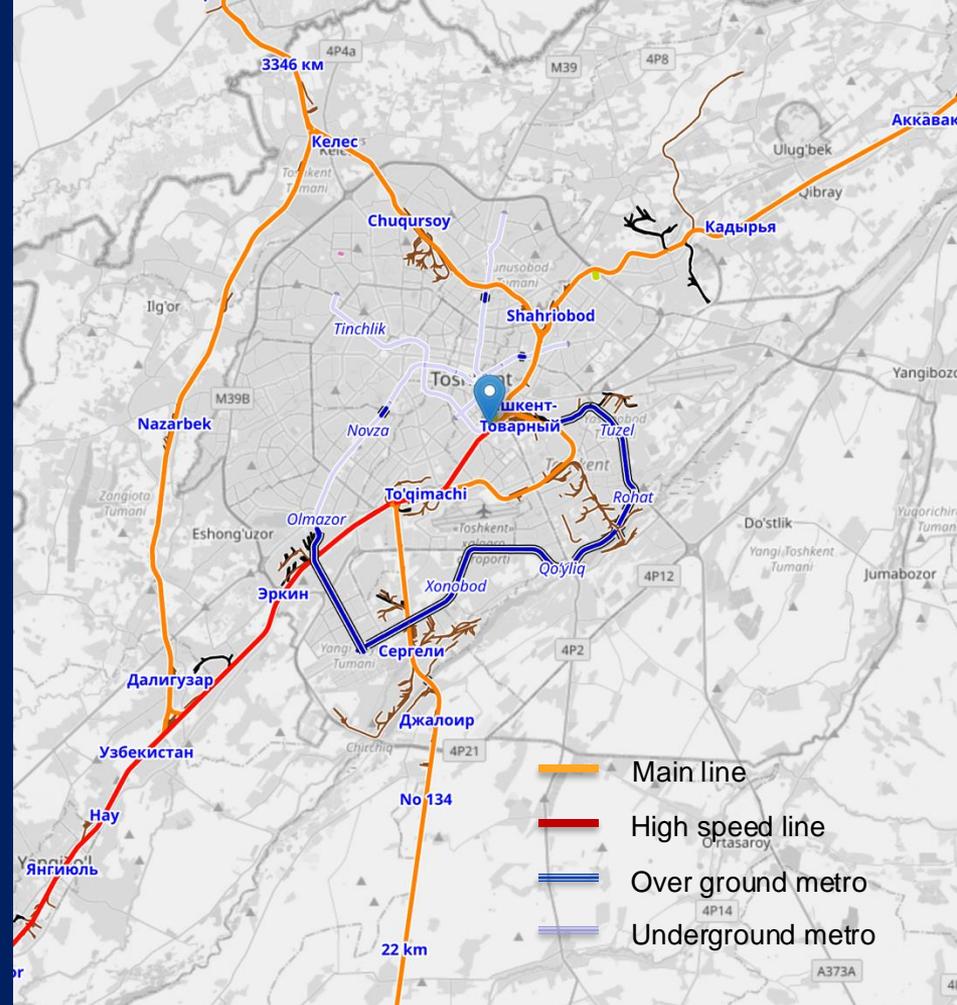


- Tashkent-Bekabad line
- Tashkent-Angren line
- Tashkent-Khodjakent line



Limited railway Infrastructure

- **Problem:** The current railway infrastructure in the Tashkent region is sparse, with only a few main lines connecting the city to surrounding areas. This limits the ability to increase passenger transport capacity.
- **Impact:** Due to the limited number of railway lines, public transport alternatives to private vehicles are insufficient, leading to increased traffic congestion and a reliance on personal cars.
- **Socio-economic relevance:** As the population grows and the economy expands, with more employers and higher car ownership, the limited railway infrastructure becomes inadequate to meet the transportation needs.



Socio-economic factors affecting railway transport volume

Dependant variable	Year	2019	2020	2021	2022
	Passenger traffic by public railway (thousand people)		11170,1	2962,2	3392,1
Independent variables	GDP per capita (thousand UZS)	52095,9	57884,5	71372,4	82174,5
	Permanent population (thousand people)	5408,4	5513,6	5670,3	5802,1
	Employed population (thousand people)	2415,5	2420,7	2539,8	2575,6
	Number of enterprises (units)	106703	131508	152778	164547
	Number of vehicles per 1000 inh. (units)	226,8	251,1	274,4	297,3
	Average salary (UZS)	2403258,15	2774064,55	3394259,8	4012608,75

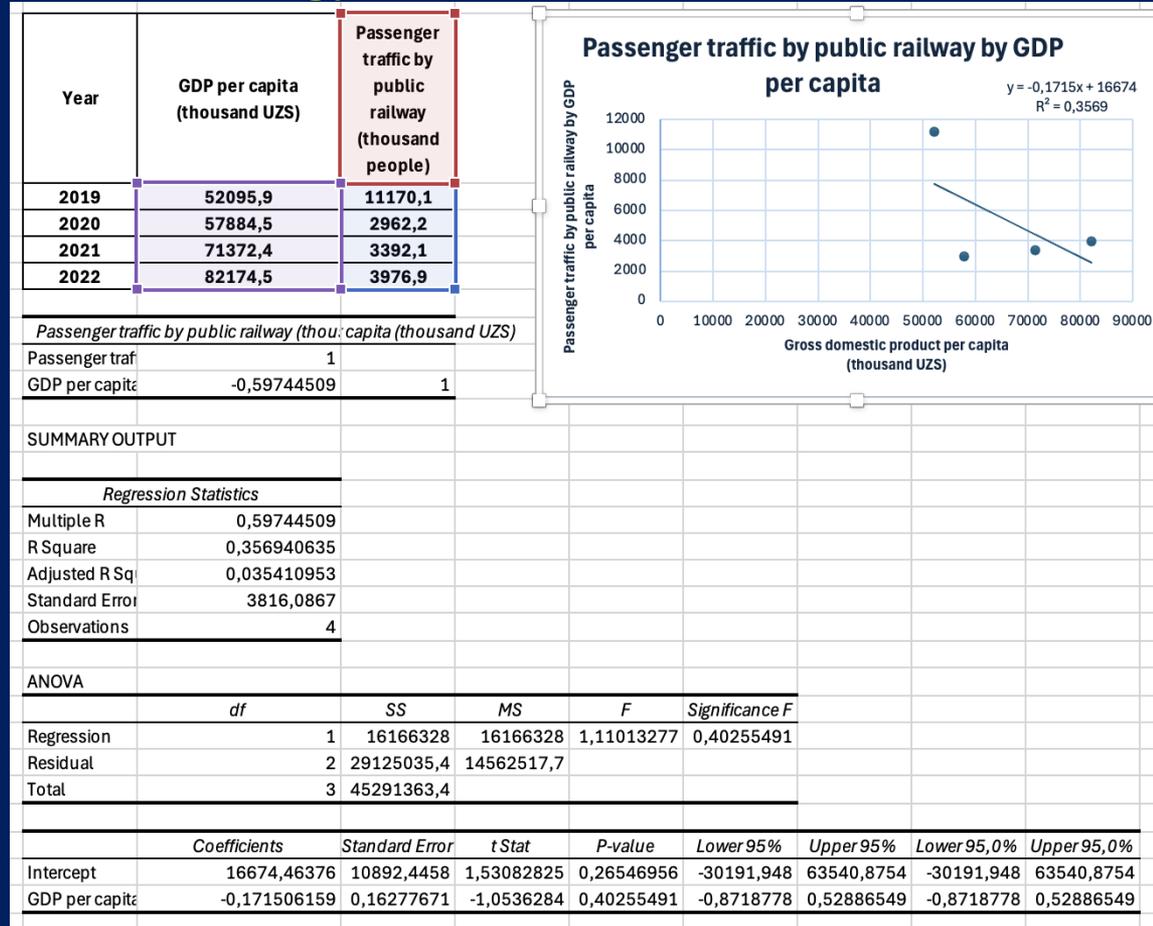
Statistical data of Tashkent, Uzbekistan (2020-2022) from the official Statistics Agency website under the President of Uzbekistan.



Methodology

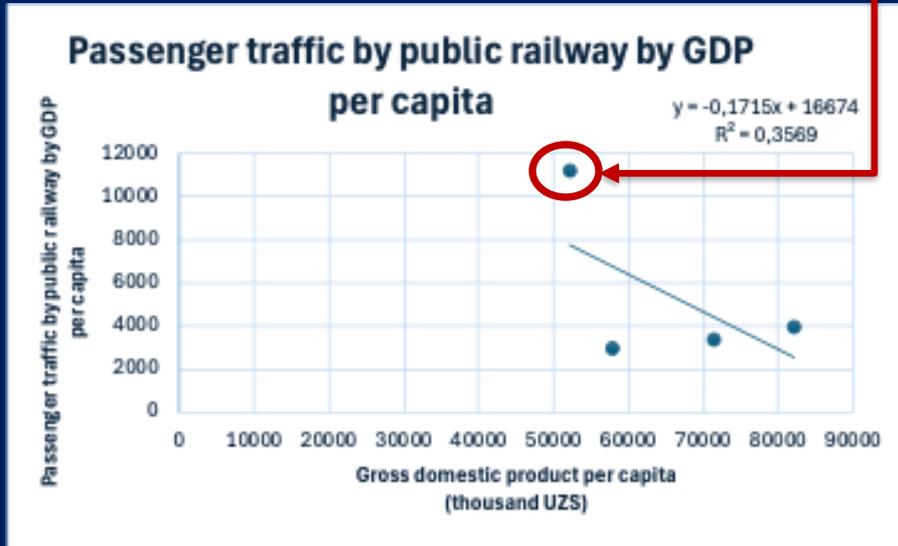
- **Correlation analysis:** Used Excel's correlation function to measure the strength and direction of relationships between variables.
- **Regression analysis:** Applied Excel's regression tools to model and quantify relationships, using outputs like coefficients and R-squared values.
- **Scatter plots:** Created scatter plots in Excel to visually assess data relationships and fit of regression models.

Same process has been carried out for all socio-economic factors



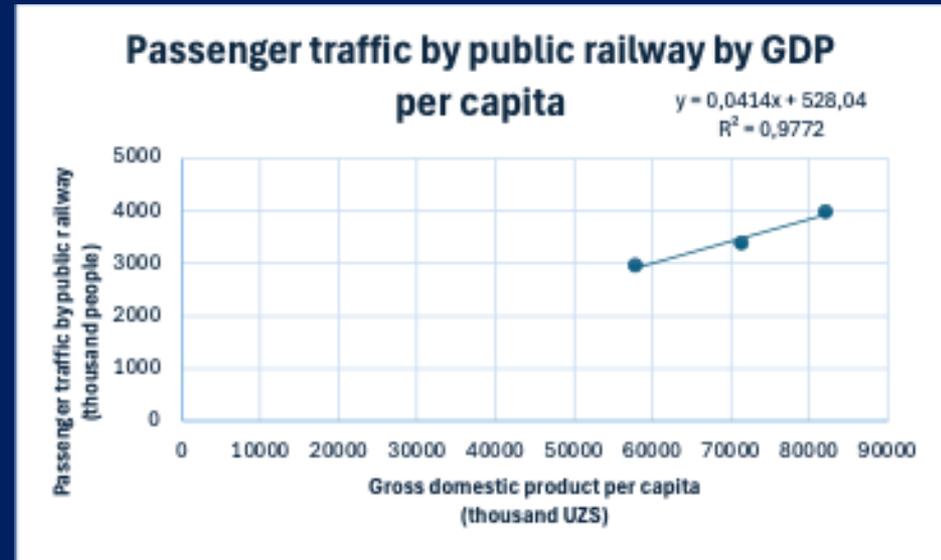
Data consideration and results

Pattern of usage of railway transport before pandemic



Scatterplot of data analysis between 2019-2022

Scatterplot of data analysis between 2020-2022

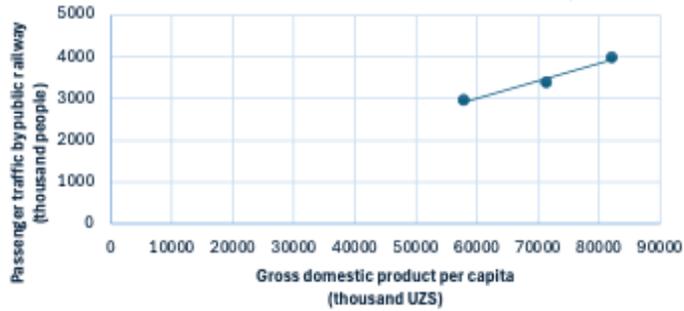


Data skew: Pre-pandemic passenger numbers and economic disruptions caused unusual patterns.
Comparison issues: Differences in social and economic factors led to results that are contrary to expectations.
Result interpretation: Eliminating 2019 data was necessary to prevent skewed comparisons and misleading conclusions.



Results and findings

Passenger traffic by public railway by GDP per capita

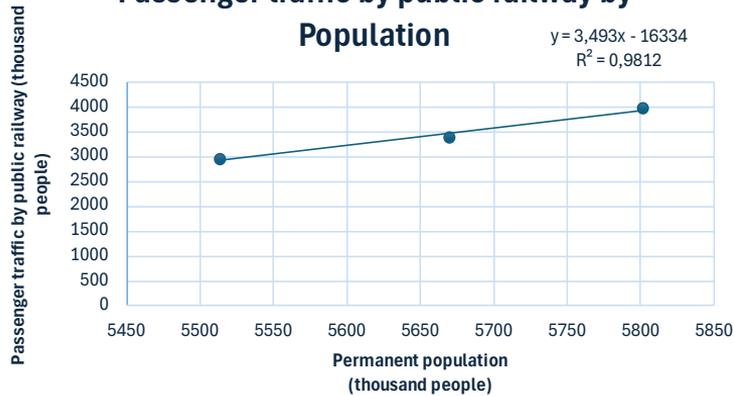


1. Public railway passenger transportation by GDP per capita

The value R2 (0.98) measures how well GDP per capita accounts for the changes in the number of railway passengers, meaning GDP per capita explains 98% of the variation in passenger volume.

Coefficient for GDP per capita (0.041) suggests that for every unit increase in GDP per capita, the passenger volume transported by railway increases by 0.041 units or 41 passengers

Passenger traffic by public railway by Population



2. Public railway passenger transportation by population

The value R2 (0.98) shows that 98% of the variation in railway passenger volume can be attributed to changes in the permanent population, highlighting a very strong connection between the two.

Coefficient for permanent population (3.49) suggests that for every increase of one thousand people in the permanent population, the volume of railway passengers is expected to rise by approximately 3.49 units or 3490 passengers.

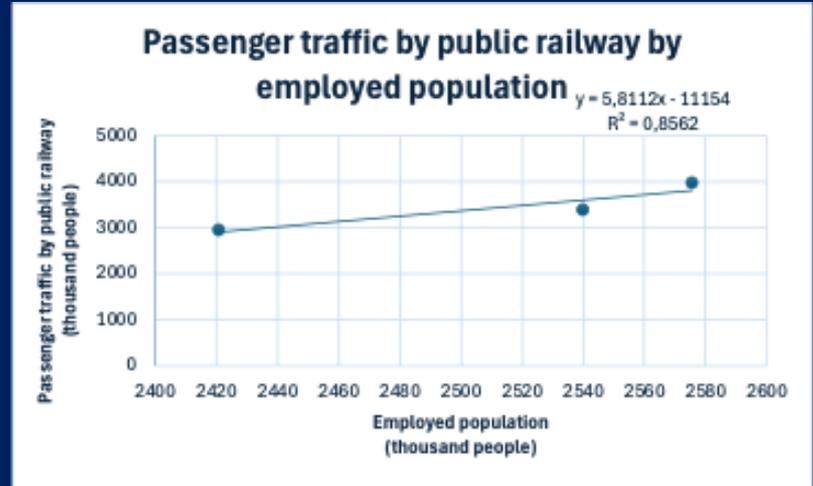


Results and findings

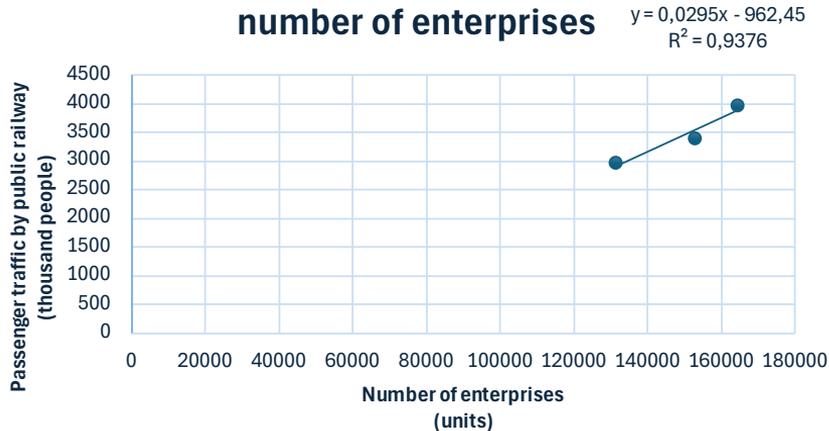
3. Public railway passenger transportation by employed population

The value R2 (0.86) indicates a strong relationship meaning that 86% of the changes in the number of railway passengers can be explained by how many people are employed. This shows a strong link between the two.

Coefficient = 5.81, indicating for every thousand more people who are employed, it can be expected about 5.81 more passengers to use the railway. This means as more people have jobs, more people tend to use public railways.



Passenger traffic by public railway by number of enterprises



4. Public railway passenger transportation by number of enterprises

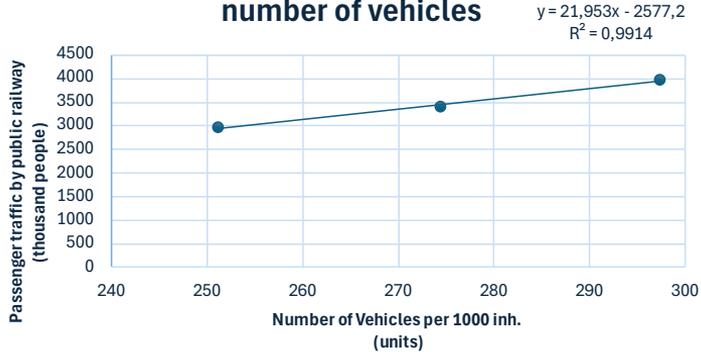
Strong relationship is expressed by R2 (0.94) that about 94% of the changes in railway passenger numbers can be explained by the number of enterprises.

Coefficient 0.03, resulting that for each additional enterprise, the number of railway passengers is expected to increase by about 0.03 units or 30 passengers. This means that as the number of businesses grows, there's a slight increase in railway usage.



Results and findings

Passenger traffic by public railway by
number of vehicles



5. Public railway passenger transportation by number private vehicles

Very Strong Relationship of R2 (0.99) in the analysis shows that about 99% of the changes in railway passenger traffic can be explained by the number of vehicles per 1,000 inhabitants. This suggests an extremely strong connection between the two variables.

Coefficient of 21.95 means that for every additional vehicle per 1,000 inhabitants, the number of railway passengers is expected to increase by approximately 21.95 units or 21,950 passengers

Passenger traffic by public railway by
average salary



6. Public railway passenger transportation by average salary

The regression line shows a very strong positive linear relationship between. The value of R2 (0.99) indicates that about 99% of the variation in railway passenger traffic can be explained by changes in average salary. This suggests that as salaries increase, more people tend to use public railways.

The coefficient 0.00082, meaning that for every 1 UZS increase in the average salary, there is an expected increase of approximately 0.00082 in railway passenger traffic or 0.82 people



Conclusions

1. **Population and employment:** Both are strong predictors of rail usage, indicating that as population and employment levels recover post-COVID, public transport demand increases significantly.
2. **GDP per capita and average salary:** While these factors are strongly correlated with rail usage, their actual impact is modest, suggesting economic changes influence rail travel less than other factors.
3. **Private vehicle ownership:** Surprisingly, increased vehicle ownership is linked to higher rail usage. This could indicate that as people gain more mobility options, they also use railways more, possibly for longer or more diverse trips where rail offers convenience over cars.

Overall, while the short timeframe limits generalization, the study highlights key socio-economic drivers of rail usage in Tashkent's post-COVID recovery. Longer-term research is needed for more comprehensive insights.



Suggestions for controlling and improving traffic problems in Tashkent

1. Revise parking policies:

- *Limit parking availability:* Reduce parking spaces in congested urban areas, particularly in city centers, to discourage driving and encourage the use of public transport.
- *Implement dynamic pricing:* Introduce variable parking fees based on location and time of day to reduce demand for parking in high-traffic areas.

2. Promote public transport benefits:

- *Awareness campaigns:* Highlight the environmental, economic, and convenience benefits of using public transport over private vehicles.
- *Incentivize public transport use:* Offer discounts or subsidies for frequent users of public transport, particularly for commuters.

3. Improve traffic management:

- *Smart traffic systems:* Implement advanced traffic management systems to optimize traffic flow, reduce congestion, and prioritize public transport lanes.
- *Congestion charging:* Consider introducing congestion charges in the most crowded areas to reduce unnecessary car travel and fund public transport improvements.

By implementing these measures, Tashkent can alleviate traffic congestion, reduce reliance on private vehicles, and improve the overall efficiency and sustainability of its transport system.



Thank you for attention!
Děkuji za pozornost!
Благодаря за вниманието!
Ďakujem za pozornost!
Dziękuję za uwagę!

Komil Turaev

Department of Rail Transport
Silesian University of Technology
Katowice, Poland
Komil.Turaev@polsl.pl

Prof. Aleksander Śladkowski

Department of Rail Transport
Silesian University of Technology
Katowice, Poland
Aleksander.Sladkowski@polsl.pl

