A tram in Kyiv. Photo by: Viktor Zagreba

Study of tram systems in Ukrainian cities in 2023

NGO "Vision Zero"

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VISION ZERO

Contents

Introduction

Since the 1990s, tram systems in Ukrainian cities have been going through difficult times: lines are being closed, infrastructure is becoming outdated, routes are being reduced, and rolling stock is increasingly out of order. Trams are becoming less and less reliable and attractive to people. The commissioning of new rolling stock in some cities is rather an exception that does not affect the overall negative trends.

Ukraine has traditionally had another problem: a lack of data. Open public data on public transport is extremely difficult to find. When it is available, it is difficult to draw analytical conclusions.

As the famous phrase goes, you cannot manage what you do not measure. Therefore, the authors of this study set out to partially fill the information vacuum on public transport and measure the speed of trams on all active electric public transport routes.

The study is intended for informational and educational purposes. Due to the lack of reliable data, the results presented may contain errors or gaps. Also, the situation could have changed after the data was collected. The authors hope that Ukraine will implement the practice of publishing open data on public transport, as envisaged by the Resolution of the Cabinet of Ministers of Ukraine of 21 October 2015 No. 835 "On Approval of the Regulation on Data Sets to be Published in the Form of Open Data".

We look forward to hearing feedback and comments from stakeholders and suggestions for future research in this area.

Objectives and scope of the study

The subject of the study is tram service in Ukrainian cities in 2023. The study was conducted for the following purposes:

1. **To record the current state** and performance of tram systems in Ukraine by the end of 2023 (in a full-scale war) for future comparisons;
2. **To compare the tram systems of Ukrainian cities with each other in terms** of various parameters that can be considered indicators of the quality of transport services;
3. **To create publicly available analytical information** for other researchers, journalists, officials, politicians, and other stakeholders and organisations;
4. **To draw the attention of political decision makers** to the state of electric public transport and the need for public and international investment in modernising tram infrastructure, in particular as part of the post-war recovery of Ukraine's economy and infrastructure and in order to achieve climate goals.

The study collected and processed data on:

- 13 out of 18 cities in Ukraine with existing and operational tram systems (not including occupied cities);
- 106 tram routes with a total length of 2103 km;
- 4411 stops along these 106 routes.

Methodology

The study was conducted on the basis of administrative data of tram routes and timetables provided by the municipal transport companies. In cities where the transport companies refused to provide data, the authors of the study had to use other sources, which could affect the accuracy of the data and the correctness of the results.

The study does not cover the routes of "speed tram" ("швидкісний трамвай"), as this mode of transport is not a city tram and is rather classified as LRT (Light Rail Transit). This type of transport in Ukraine operates in Kyiv and Kryvyi Rih. For these cities, only data from conventional tram routes were taken into account. The study did not include tram systems in the temporarily occupied territories of Ukraine.

The speed of movement was determined by dividing the length of the route by the duration of the trip during off-peak hours (except for routes that operate only during peak hours). The journey time was taken as the time between the final destinations in both directions according to the timetable. For the cities that did not provide data, the researchers applied the same methodology, but the input information was obtained from websites or online data on the actual presence of trams on routes and the online measurement of journey times.

Data sources:

Dnipro, Mykolaiv, Kryvyi Rih, Zaporizhzhia, Kamianske, and Druzhkivka provided official responses from the municipal transport companies to the information request of the NGO Vision Zero. In **Kyiv** and **Odesa,** the data was partly published on the websites of the municipal enterprises and partly obtained from other sources. **Kyiv**: Kyivpastrans and Easyway websites;
Lviv, Vinnytsia and Zhytomyr: Rozklad.in.ua and Easyway; **Odesa**: Odesmiskelectrotrans and Easyway;
Kharkiv: Kharkiv Transport website and Easyway; **Konotop**: Easyway.

Data on infrastructure and rolling stock: Ukrelectrotrans Corporation, 2023. Population data: “Statistical report "The population of Ukraine", State Statistics Service, 2020.

Tram systems in Ukrainian cities 2023

Oleksandr Kolodko ©

Research in numbers

13

cities

106

tram routes

9 km

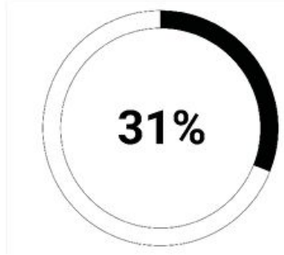
average length of routes

13,5 km/h

average speed of trams in Ukraine

2,24 stops/km

average frequency of PT stops placement



only 33 out of 106 routes have a speed of over

15 km/h*

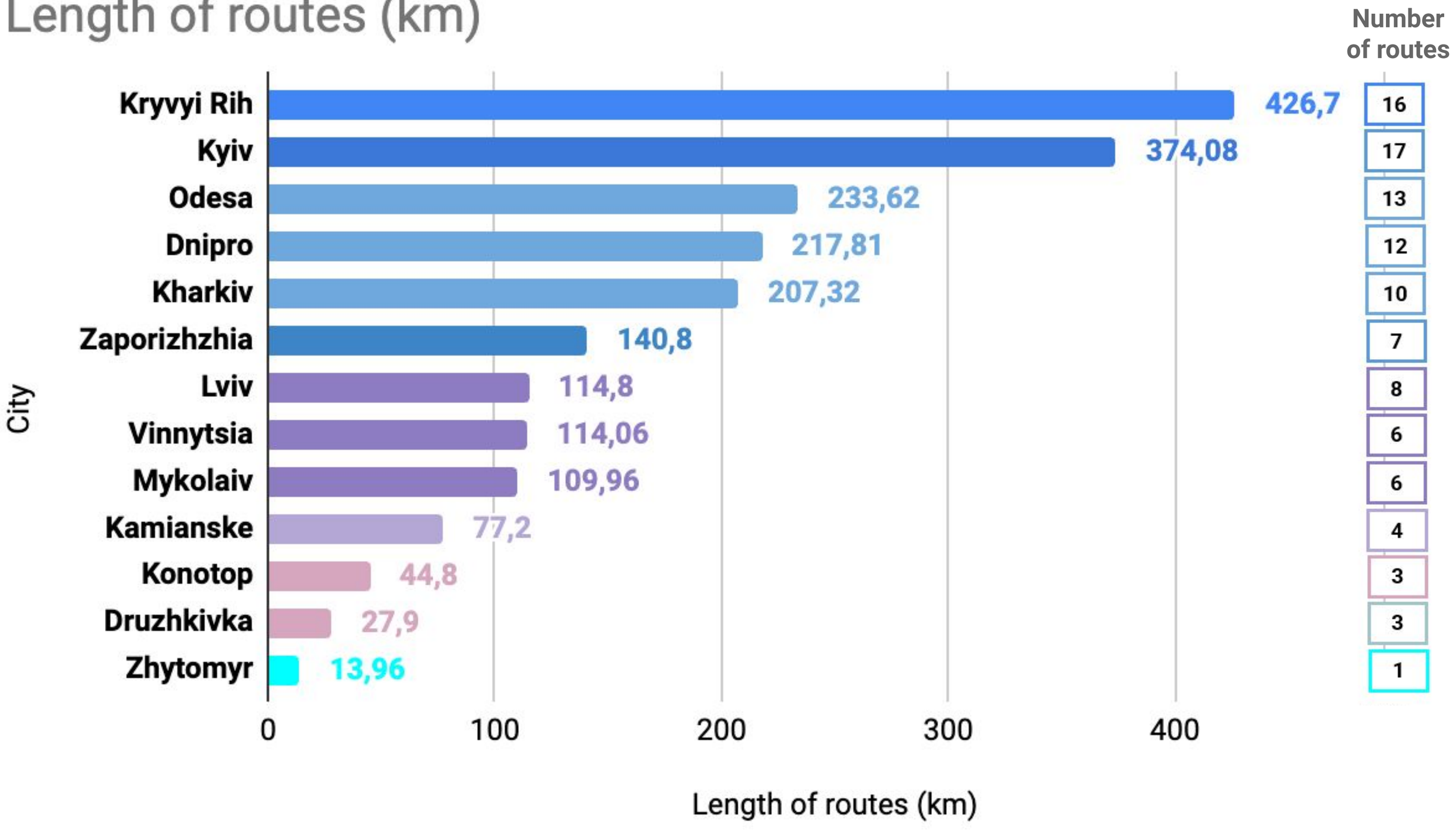
470 m

average distance between PT stops

31%

routes comply with the eNational construction norm «Planning and development of territories» regarding speed

Length and number of routes (diagram)

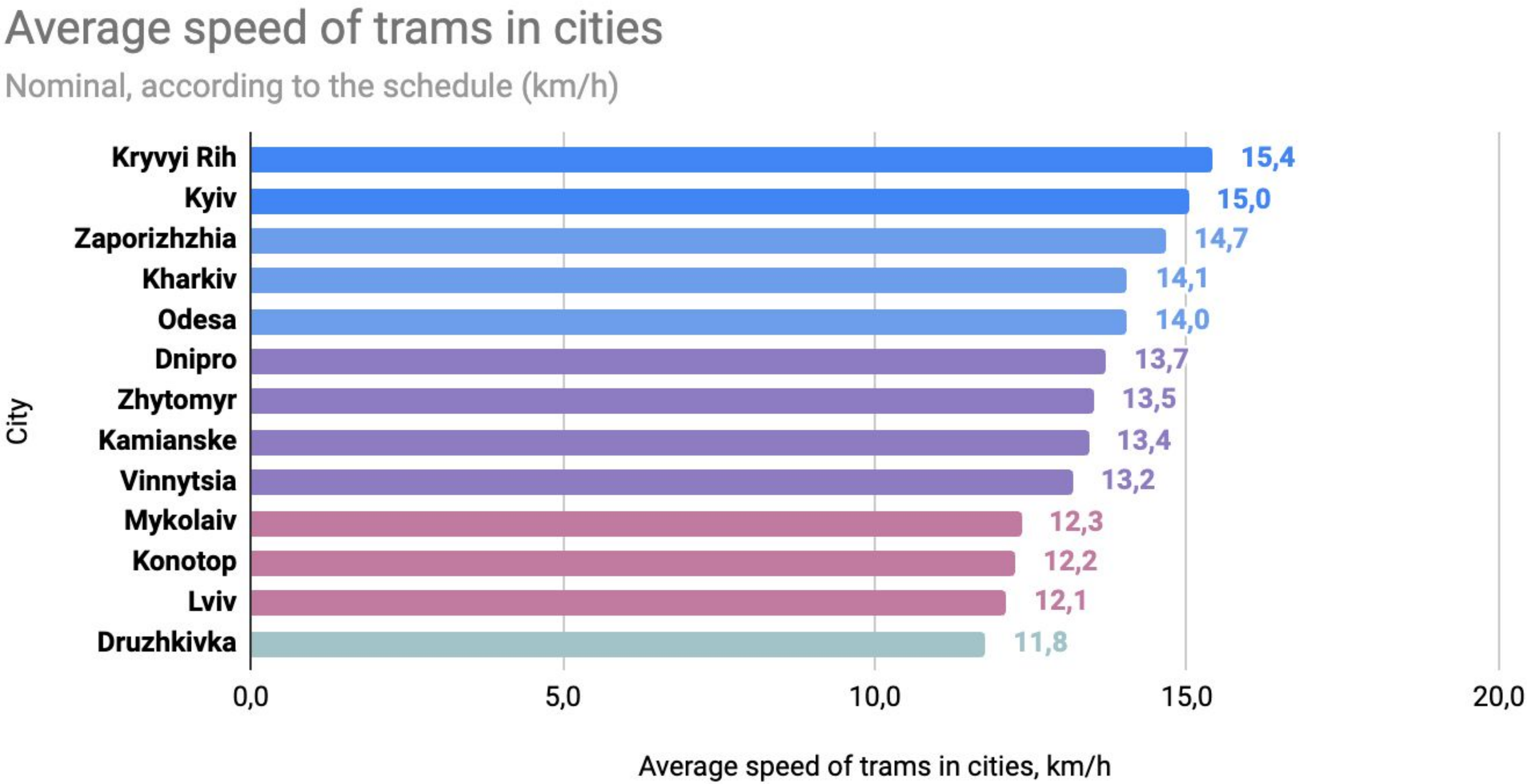


Length and number of routes (table)

№	City	Length of routes (km)	Number of routes
1	Kryvyi Rih	**426,7**	16
2	Kyiv	**374,1**	17
3	Odesa	**233,62**	13
4	Dnipro	**217,81**	12
5	Kharkiv	**207,32**	10
6	Zaporizhzhya	**140,8**	7
7	Lviv	**114,8**	8
8	Vinnytsia	**114,06**	6
9	Mykolaiv	**109,96**	6
10	Kamianske	**77,2**	4
11	Konotop	**44,8**	3
12	Druzhkivka	**27,9**	3
13	Zhytomyr	**13,96**	1
	Total	**2103,0**	**106**

A typical tram in Kryvyi Rih.
Photo source: https://kr.informator.ua/

Average speed of trams in cities (diagram)



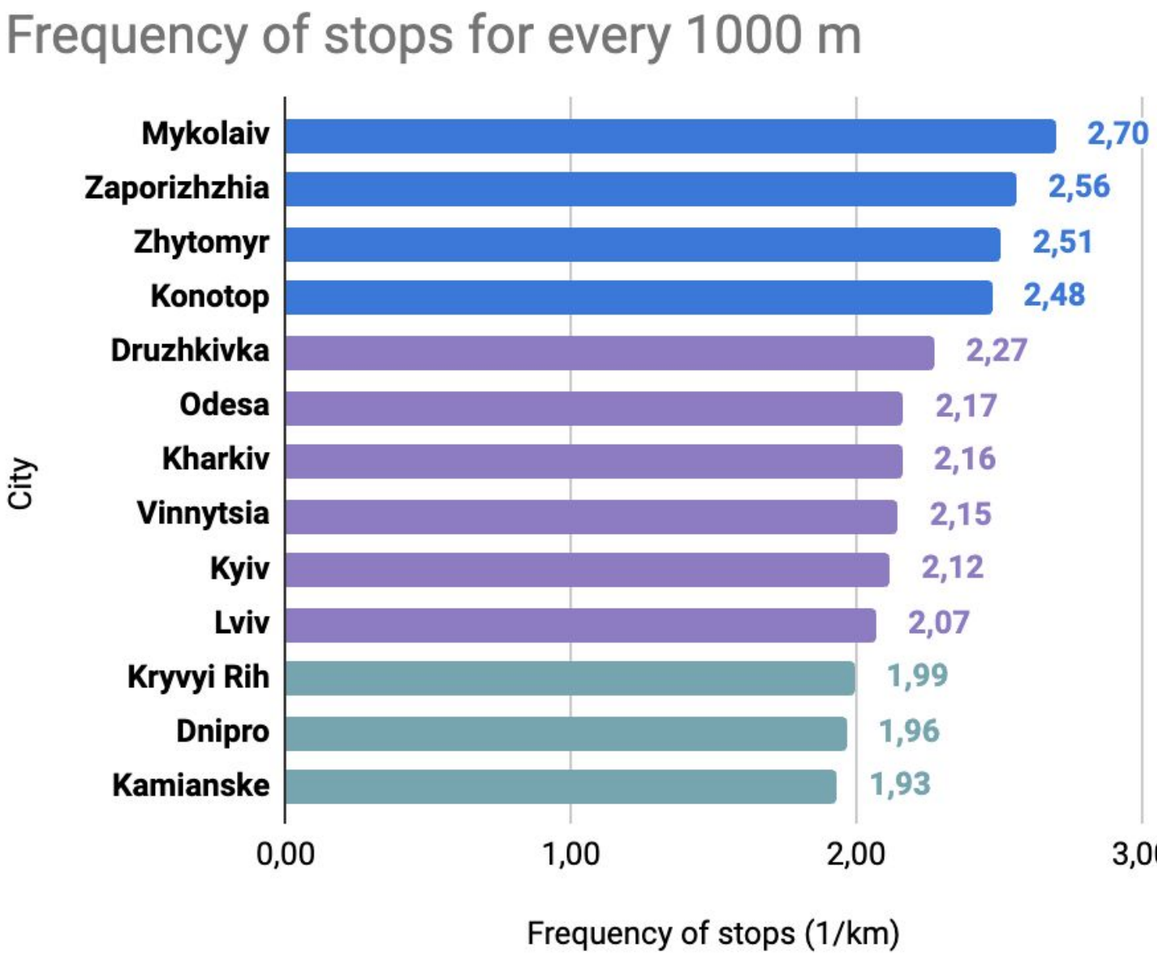
Average speed of trams in cities (table)

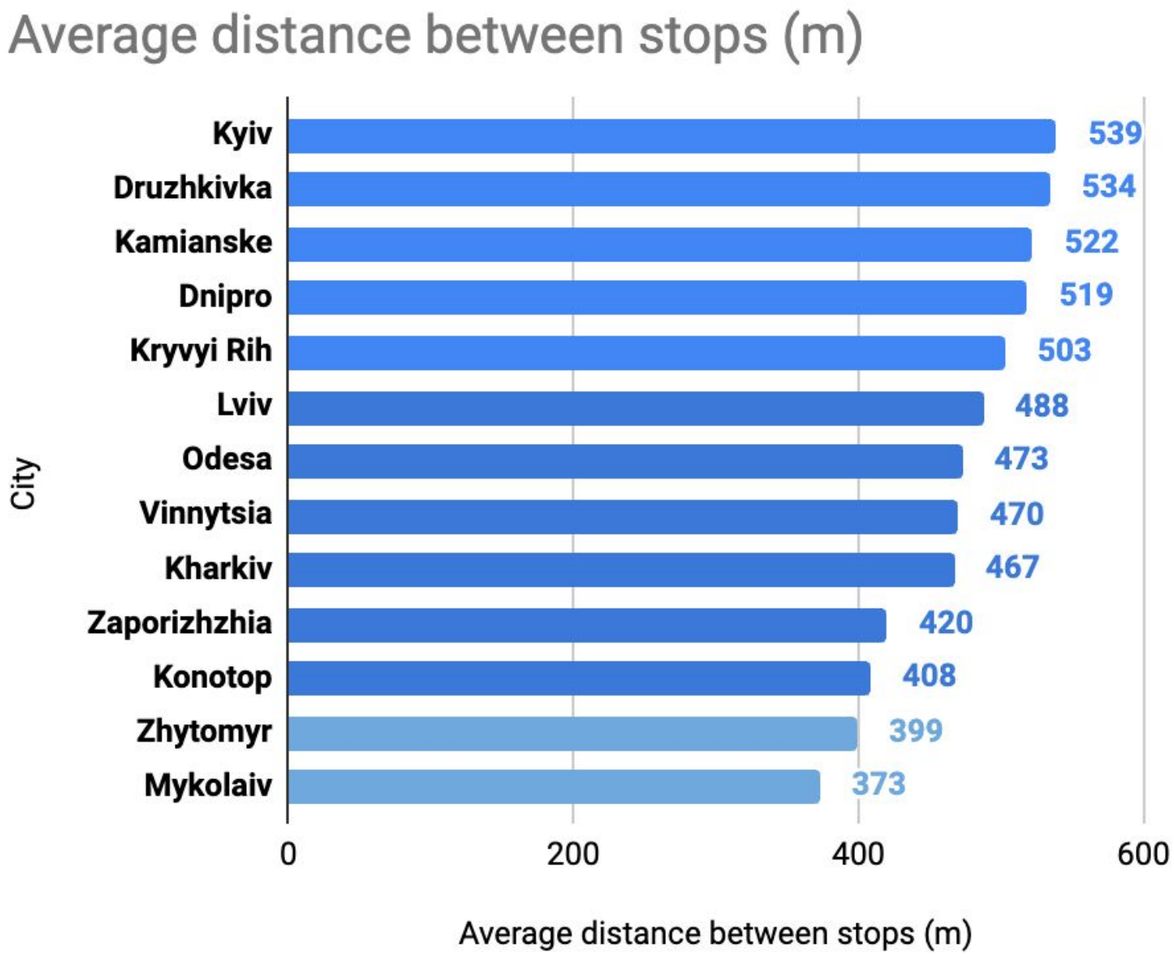
№	City	Average speed of all routes, km/h	Slowest route, km/h	Fastest route, km/h
1	Kryvyi Rih	**15,4**	12,4	**20,7**
2	Kyiv	**15,0**	13,7	16,7
3	Zaporizhzhya	**14,7**	13,4	16,1
4	Kharkiv	**14,1**	10,4	15,9
5	Odesa	**14,0**	10,1	17,2
6	Dnipro	**13,7**	11,7	16,2
7	Zhytomyr*.	**13,5**	13,5	13,5
8	Kamianske	**13,4**	12,4	14,3
9	Vinnytsia	**13,2**	12,1	14,2
10	Mykolaiv	**12,3**	11,9	12,7
11	Konotop	**12,2**	11,2	13,4
12	Lviv	**12,1**	10,5	14,9
13	Druzhkivka	**11,8**	11,6	11,9

A tram in Kyiv on Kontraktova Square.
Author: Victor Zagreba

*only one route operates in Zhytomyr

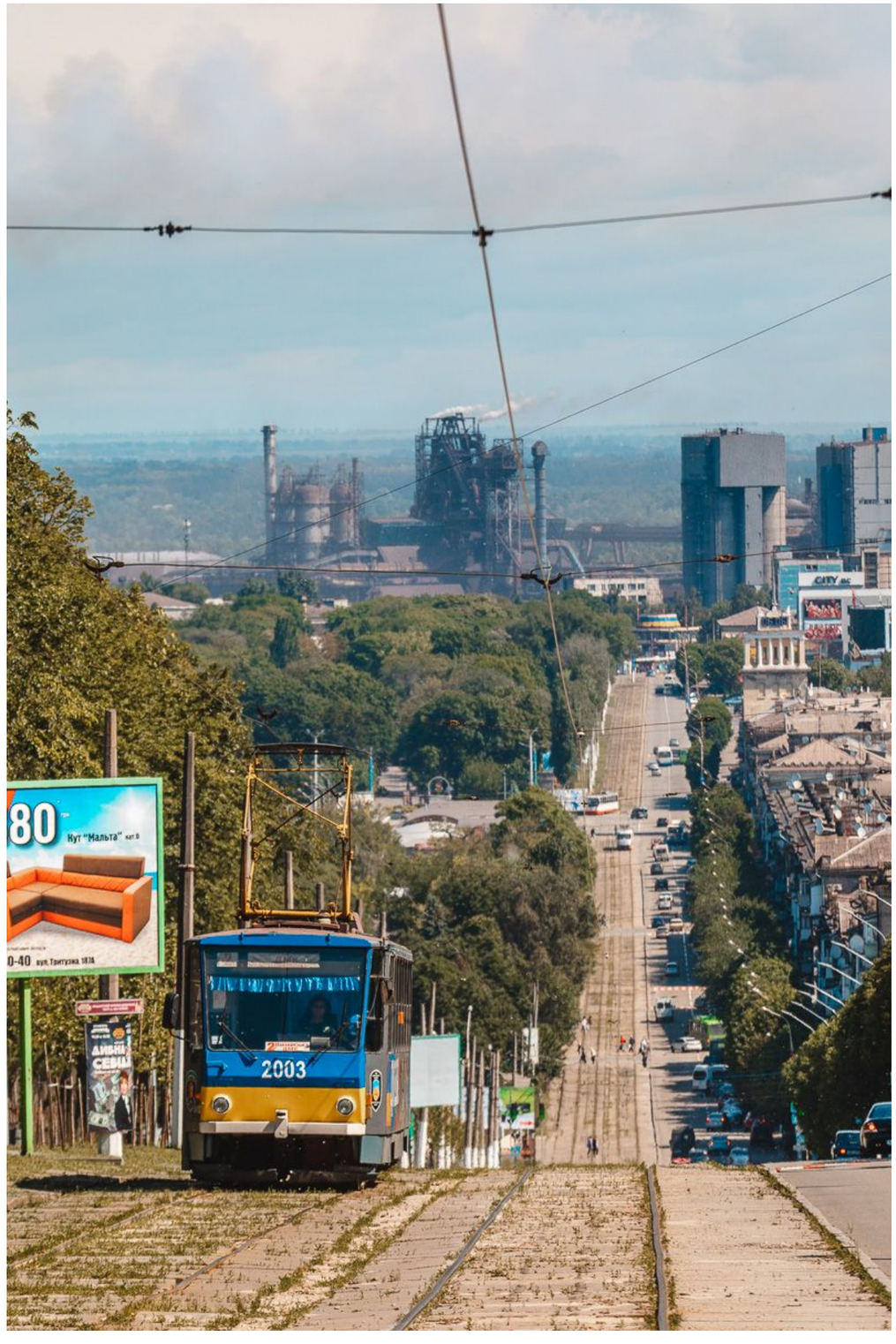
Frequency of stops and average distance between stops





Frequency of stops and average distance between stops

№	City	Frequency of stops, for every 1000 m	Average distance between stops
1	Mykolaiv	**2,70**	373
2	Zaporizhzhya	**2,56**	420
3	Zhytomyr	**2,51**	399
4	Konotop	**2,48**	408
5	Druzhkivka	**2,27**	534
6	Odesa	**2,17**	473
7	Kharkiv	**2,16**	467
8	Vinnytsia	**2,15**	470
9	Kyiv	**2,12**	539
10	Lviv	**2,07**	488
11	Kryvyi Rih	**1,99**	503
12	Dnipro	**1,96**	519
13	Kamianske	**1,93**	522

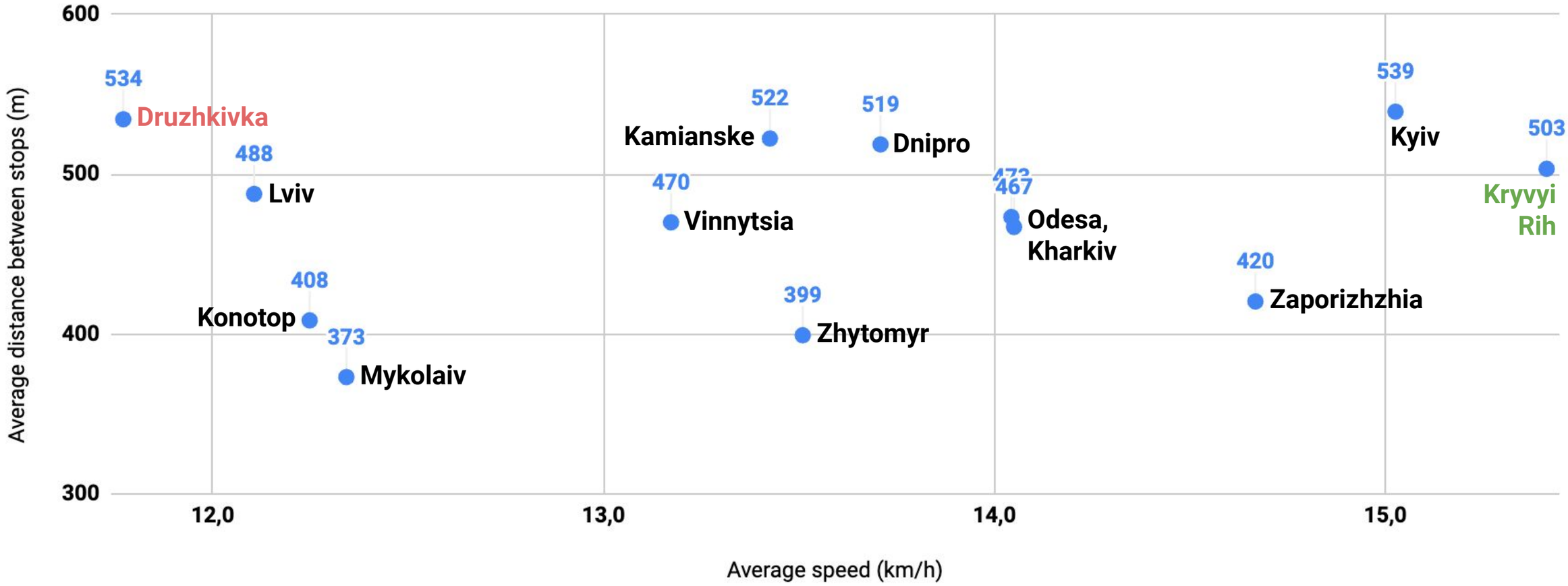


A tram line in Kamianske.
Photo by: dittohead | alltransua.com

Average speed and stops

Speed and distance between stops

Ratio of average speed (km/h) to average distance between stops (m)



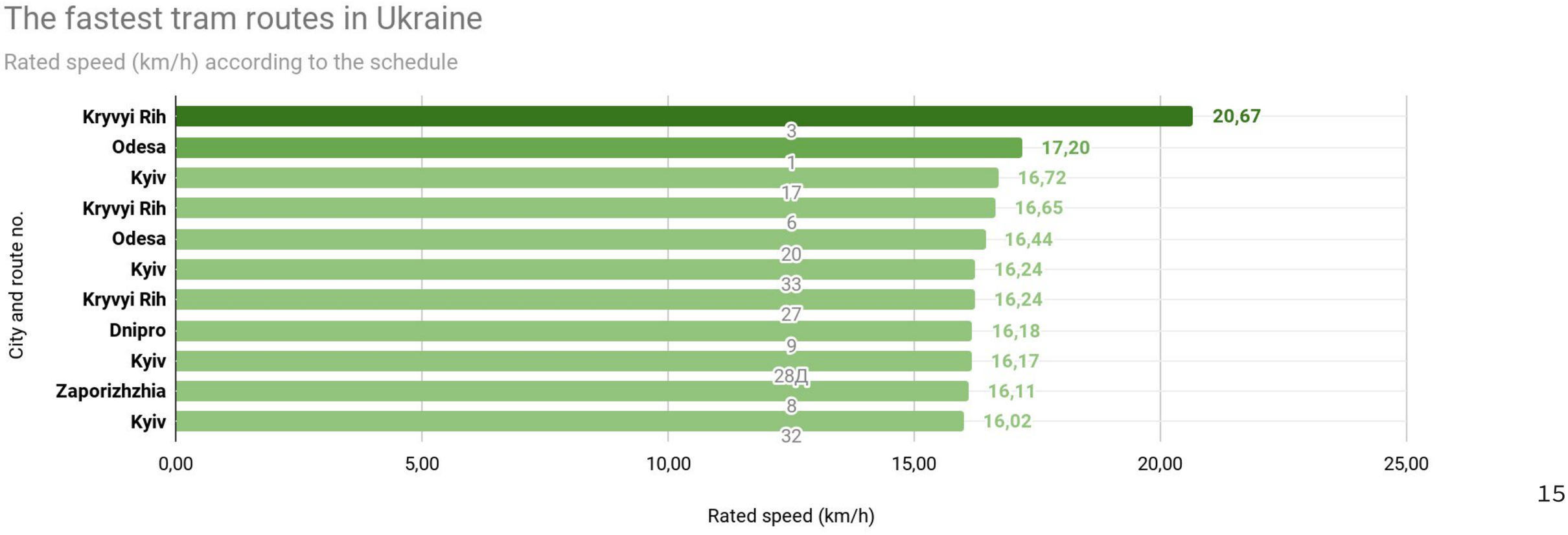
One of the factors that affects travel speed is the distance between stops and their frequency along the route.
The more stops there are, the slower the speed between them, and the longer the journey time. However, in Ukrainian realities, only the Kryvyi Rih tram network (without LRT lines) is clearly different, which has the highest speed and the lowest frequency of stops. With a similar frequency of stops, the tram in Kamianske is 15% slower than the one in Kryvyi Rih.

Lviv, Vinnytsia, Kharkiv and Odesa and Kyiv have similar values for the average number of stops per 1 km and the distance between stops, but the speeds are significantly different. This suggests that other traffic conditions and the state of the infrastructure and rolling stock have a greater impact on speed than just the frequency of stops or distance.

TOP-10 fastest routes in cities

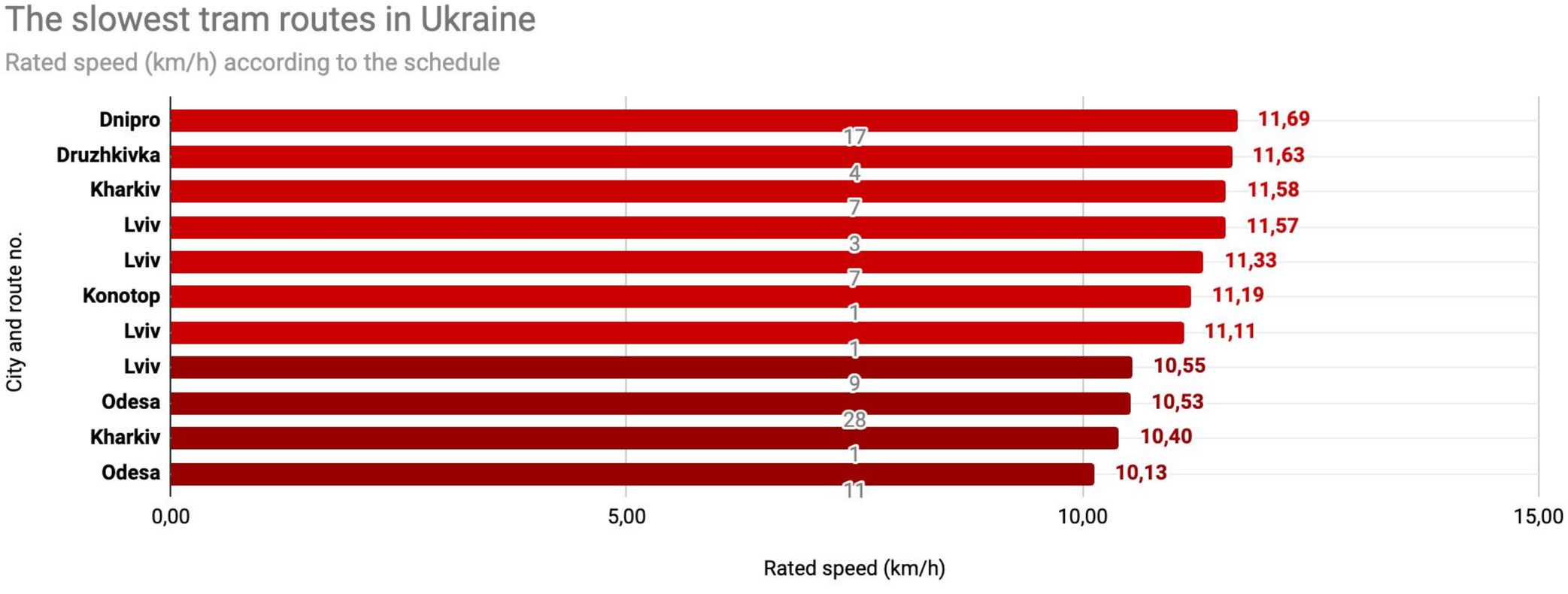
Pos.	City	Routes		Rated speed, km/h
		№	terminus A - terminus B	According to schedule
1	**Kryvyi Rih**	**3**	Bukovynska Street - Aktsionerna Street	20,67
2	**Odesa**	**1**	Black Sea Cossacks str. - Centrolit plant	17,20
3	**Kyiv**	**17**	Pushcha-Vodytsia - Yordanska Street	16,72
4	**Kryvyi Rih**	**6**	Bukovynska Street - Zbahachuvachna Street	16,65
5	**Odesa**	**20**	Kherson Square - Khadzhibey Estuary	16,44
6	**Kyiv**	**33**	Serge Lifar Street - DVRZ (Makarenko)	16,24
6	**Kryvyi Rih**	**27**	Zbahachuvachna Street - Kryvyi Rih-Holovnyi station	16,24
7	**Dnipro**	**9**	Staromostova Square - Meat processing plant	16,18
8	**Kyiv**	**28Д**	Myloslavska Street - Pozniaky metro station	16,17
9	**Zaporizhzhya**	**8**	Siliconpolymer plant - Pavlo Kichkas	16,11
10	**Kyiv**	**32**	DVRZ (Makarenko) - Lisova metro station	16,02

N.B.
Kryvyi Rih route no. 3 passes through industrial and single-family home zones, and rarely intersects with traffic. This explains its high nominal speed.



10 slowest routes in cities

Pos.	City	Routes		Rated speed, km/h
		№	terminus A - terminus B	According to schedule
96	**Dnipro**	**17**	Staromostova Square - Mykola Rudenko Street	**11,7**
97	**Druzhkivka**	**4**	ATB - Mashynobudivnykiv neighbourhood	**11,6**
98	**Kharkiv**	**7**	Novoselivka - Pivdennyi railway station	**11,6**
99	**Lviv**	**3**	Soborna Square - Aqua Park	**11,6**
100	**Lviv**	**7**	Tatarbunarska - Pohulianka	**11,3**
101	**Konotop**	**1**	Depovska Street - Zahrebellia	**11,2**
102	**Lviv**	**1**	Railway station - Pohulianka	**11,1**
103	**Lviv**	**9**	Railway station - Torfiana	**10,5**
104	**Odesa**	**28**	Shevchenko Park - Pastera Street	**10,5**
105	**Kharkiv**	**1**	Pivdennyi Railway Station - Ivanivka	**10,4**
106	**Odesa**	**11**	Starosinna Square - Oleksiyivska Square	**10,1**



Conclusions and comments

Conclusions

1. The State Construction Norms of Ukraine DBN B.2.2-12:2019 "Planning and Development of Territories" stipulate a tram route speed of 15-20 km/h. In 2023, **only 33 out of 106 or 31.1% of Ukrainian tram routes had a speed of more than 15 km/h,** reaching the lower limit according to the DBN. Only 1 route in Kryvyi Rih reached the upper limit, which runs through sparsely populated parts of the city.

2. **The tram in Ukraine is too slow compared to other means of transport** (car, bus, or even bicycle), and therefore unattractive for many passengers.

Tram rails with a curved profile in Odesa.
Photo source: screenshot from Yurik203 video

3. **The distance between stops does not have a decisive impact on the speed of trams,** although it varies significantly between cities, from 372 to 520 metres (a difference of about 150 metres, or +40%). It is the poor state of infrastructure and traffic management that constitute obstacles to the speedy and reliable flow of rail electric transport.

Mixed tram and car traffic in Lviv.
Photo by the author: Demyan Danyliuk

Comments

1. Low route speeds are an indicator of systemic problems: the **degrading state of the infrastructure,** which does not allow even relatively new trams to move faster; **non-optimal street layout**, when trams move on shared lanes with automotive traffic and suffer from congestion; **outdated rolling stock** that is unable to maintain speeds within the DBN.

2. **Lviv and Vinnytsia** are known as leading cities that are working to improve tram services and where trams are a popular mode of transport. However, they **have low speeds**. This can be explained by a number of objective factors, such as **speed limits due to terrain and small radius curves, as well as movement in a shared flow with motor vehicles, which** slow down Lviv trams. However, **it also shows the serious infrastructure problems** even in these relatively successful cities.

3. **The leading cities in the ranking** - Kyiv, Kryvyi Rih, Zaporizhzhia and Kharkiv, Odesa and Dnipro - **have a much higher number of tram lines on separate tracks** and on streets without heavy car traffic than other cities, which is reflected in slightly higher speeds, even with unsatisfactory infrastructure and rolling stock.

Derailment of a tram in Zaporizhzhia, 2019.
Photo source: https://actual.today/

A tram amidst car traffic on M. Kotsiubynskoho Avenue in Vinnytsia.
Photo source: https://urban.vn.ua/

Recommendations

Recommendations

Recommendations of the authors of the study to the central government authorities of Ukraine:

1. Recognise that the problems of tram transport are of a national nature, and therefore require action at the state level in the form of updated national policies and creation of funding mechanisms
2. Direct public and international investments into capital repairs of the tram system infrastructure, primarily tracks, catenary and power lines, as well as depots and traction substations.
3. Establish a sound system of operational financing in line with the Association Agreement and EU Regulation 1370/2007 (obligations to provide public transport services and payment for "vehicle-km work" to operators).

Recommendations of the study authors to local self-government bodies:

1. During repairs, reconstruction and new construction of tram lines, ensure that tram is structurally separated from the other traffic flows or that traffic is organised in such a way that the tram schedule does not depend on the car traffic congestion.

2. Ensure priority for trams at non-singnalized intersections through traffic management and organise adaptive traffic control with priority for trams at signalized intersections.

3. Revise timetables to speed up routes after reconstructions, major or minor repairs, and after eliminating technical deficiencies in the infrastructure that lead to speed limits.

4. Replace outdated tram rolling stock with modern one that meets barrier-free and energy-efficient requirements, with necessary financial resources from national and international sources in a form of grants, co-financing and loans.

City profiles

tram routes in 2023

Kryvyi Rih

Indicator	Numbers
Population:	619 278 (2020)
The date of opening:	1935
The length of the tracks:	131.5 km
Track gauge:	1524 mm
Number of depots*:	1
Number of substations:	18
Number of passenger cars*:	75

**excluding light rail vehicles*

Photo by: andrii.kharkovyi | alltransua.com

Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
3	Bukovynska Street - Aktsionerna Street	20,7	1,83	545
6	Bukovynska Street - Zbahachuvachna Street	16,7	1,89	529
27	Zbahachuvachna Street - Kryvyi Rih-Holovnyi station	16,2	1,96	512
7	Domnobudivnykiv Square - Zbahachuvachna Street	15,9	2,02	496
22	Bukovynska street - Kryvyi Rih-Holovnyi station	15,8	1,98	504
4	Bukovinskaya Street - PJSC YuGOK	15,8	1,90	527
9	Aktsionerna Street - Kryvyi Rih-Holovnyi station	15,6	2,03	493
11	Heroyiv ATO st.— Zbahachuvachna st.	15,6	1,91	525
2	Domnobudivnykiv Square - Bukovynska Street	15,5	2,04	490
25	PJSC "Kryvyi Rih Mining" - Kryvyi Rih-Holovny station	15,5	1,97	509
5	Domnobudivnykiv Square - PJSC YuGOK	15,0	2,04	491
10	Heroyiv ATO Street - PJSC GOK	14,6	1,91	524
12	Heroyiv ATO st. - Aktsionerna st.	14,5	1,99	503
14	Kryvyi Rih-Holovnyi station - Heroyiv ATO st.	14,4	2,18	458
1	Ukrainska Street - "Pivzavod"	12,4	2,30	435
8	PJSC PGOK - Zbahachuvachna Street	12,4	1,96	514
16	**Average values >>**	**15,4**	**1,99**	**503**

Kyiv

Indicator	Numbers
Population:	2 967 360 (2020)
The date of opening:	1892
The length of the tracks:	231 km
Track gauge:	1524 mm
Number of depots:	3
Number of substations:	91
Number of passenger cars:	485

Photo by: Mik9N | alltransua.com

Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
17	Pushcha-Vodytsia - Yordanska Street	16,7	2,00	500
33	Serge Lifar Street - DVRZ (Makarenko)	16,2	2,01	498
28Д	Myloslavska Street - Pozniaky metro station	16,2	4,01	250
32	DVRZ (Makarenko) - Lisova metro station	16,0	2,13	471
23	DVRZ (Makarenko) - Alisher Navoi Avenue	15,9	2,21	454
16К	Heroyiv Dnipra metro station - Kuren Park	15,8	2,09	479
18	Kontraktova Square - Starovokzalna Street	15,6	2,40	417
35	Serge Lifar Street - Lisova metro station	15,2	1,83	548
22	Perov Boulevard - ZZBC	15,0	2,20	456
12К	Pushcha-Vodytsia - Kuren Park	14,9	0,67	1485
28	Myloslavska Street - Lesna metro station	14,4	1,11	901
14	Vidradnyi Ave - Kontraktova Ploshcha	14,1	2,13	469
8	Pozniaky metro station - Lisova metro station	14,0	2,35	425
15	Starovokzalna Street - Vidradnyi Avenue	14,0	2,04	490
19К	Kuren Park - Shevchenko Square	14,0	2,48	403
29	Boryspilska metro station - Lisova metro station	13,8	2,27	440
11К	Yordan Street - Kuren Park	13,7	2,08	480
17	**Average values >>**	**15,0**	**2,12**	**539**

Zaporizhzhya

Indicator	Numbers
Population:	731 922 (2020)
The date of opening:	1932
The length of the tracks:	99.3 km
Track gauge:	1524 mm
Number of depots:	2
Number of substations:	30
Number of passenger cars:	139

Photo by: Serhii Dovhal | alltransua.com

Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
8	Siliconpolymer plant - Pavlo Kichkas	16,1	2,36	423
3	Zaporizhzhia-1 railway station - Zaporizhzhia Left	15,7	1,94	515
16	Zaporizhzhia-1 railway station - Pavlo-Kichkas	15,6	2,17	462
10	Maidan Voli - Meat processing plant	14,6	2,25	444
14	Motorway - Zaporizhzhia Circus	13,7	2,15	466
12	Maidan Voli - Zelenyi Yar ring	13,6	4,67	214
15	Maidan Voli - Shevchenkivskyi masyv	13,4	2,39	418
7	**Average values >>**	**14,7**	**2,56**	**420**

Kharkiv

Indicator	Numbers
Population:	1 443 207 (2020)
The date of opening:	1906
The length of the tracks:	217.2 km
Track gauge:	1524 mm
Number of depots:	3
Number of substations:	59
Number of passenger cars:	289

Photo by: Khartron | alltransua.com

Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
8	602nd Microdistrict - Odeska Street	15,9	1,88	533
12	Pivdennyi railway station - Central Park	15,1	2,29	438
16	Saltovska - Zhuravlivskyi Hydropark - Saburova Dacha - Saltivska	14,9	2,17	461
16a	Saltovska - Saburova Dacha - Zhuravlivskyi Hydropark - Saltivska	14,9	2,17	463
27	Saltivska - Novozhanove	14,9	1,94	514,4
20	Peremohy Ave. - Pivdennyi railway station	14,6	2,24	447
6	602nd Microdistrict - Pivdennyi railway station	14,4	1,92	521
3	Zaliutyne - Novozhanove	13,7	2,23	448
7	Novoselivka - Pivdennyi railway station	11,6	2,27	442
1	Pivdennyi railway station - Ivanivka	10,4	2,50	402
10	**Average values >>**	**14,1**	**2,16**	**467**

Odesa

Indicator	Numbers
Population:	1 017 699 (2020)
The date of opening:	1910
The length of the tracks:	197.6 km
Track gauge:	1524 mm
Number of depots:	2
Number of substations:	36
Number of passenger cars:	208

Photo by: Grashik | alltransua.com

Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
1	Black Sea Cossacks str. - Centrolit plant	17,2	1,83	546
20	Kherson Square - Khadzhibey Estuary	16,4	1,89	529
7	11 Lustdorfska Road - Paustovskoho Street	15,7	2,04	491
21	Tiraspolska Square - Zastava 2	15,2	2,20	455
12	Kherson Square - Slobidskyi district	15,2	2,34	432
27	Lustdorf - Fish port	14,8	1,68	597
17	The Kulikovo Field - 11th century Big Fountain	14,8	2,00	500
13	Starosinna Square - Shkilnyi residential area	14,1	1,88	533
15	Tyraspolska Square - Slobidskyi market	14,0	2,65	378
10	I. Rabin Street - Starosinna Square	12,7	1,98	505
5	Arcadia - Bus station	11,9	2,36	425
28	Shevchenko Park - Pastera Street	10,5	2,37	423
11	Starosinna Square - Oleksiyivska Square	10,1	2,96	338
13	**Average values >>**	**14,0**	**2,17**	**473**

Dnipro

Indicator	Numbers
Population:	990 724 (2020)
The date of opening:	1897
The length of the tracks:	172 km
Track gauge:	1524 mm
Number of depots:	1
Number of substations:	39
Number of passenger cars:	254

Photo by: CPTmotovey | alltransua.com

Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
9	Staromostova Square - Meat processing plant	16,2	1,71	587
18	DEVZ - Livoberezhnyi-3 residential complex	15,2	1,69	597
19	Staromostova Square - Livoberezhnyi-3 residential complex	15,1	1,81	551
14	Railway station - Zakhidnyi railway station	14,5	2,06	485
15	Railway station - Kryvorizka street	14,4	2,15	466
5	Zakhidny railway station - UDUNT	13,6	2,28	439
11	Railway station - DMZ	13,3	2,06	486
12	Staromostova Square - Metalware plant	13,2	2,10	476
6	Staromostova Square - Institute of the Ministry of Resources	12,9	1,50	680
1	Railway station - USUCT	12,5	1,92	522
7	Staromostova Square - UDUNT	12,0	2,16	463
17	Staromostova Square - Mykola Rudenko Street	11,7	2,13	470
12	**Average values >>**	**13,7**	**1,96**	**519**

Zhytomyr

Indicator	Numbers
Population:	263 318 (2020)
The date of opening:	1899
The length of the tracks:	17.5 km
Track gauge:	1000 mm
Number of depots:	1
Number of substations:	11
Number of passenger cars:	23

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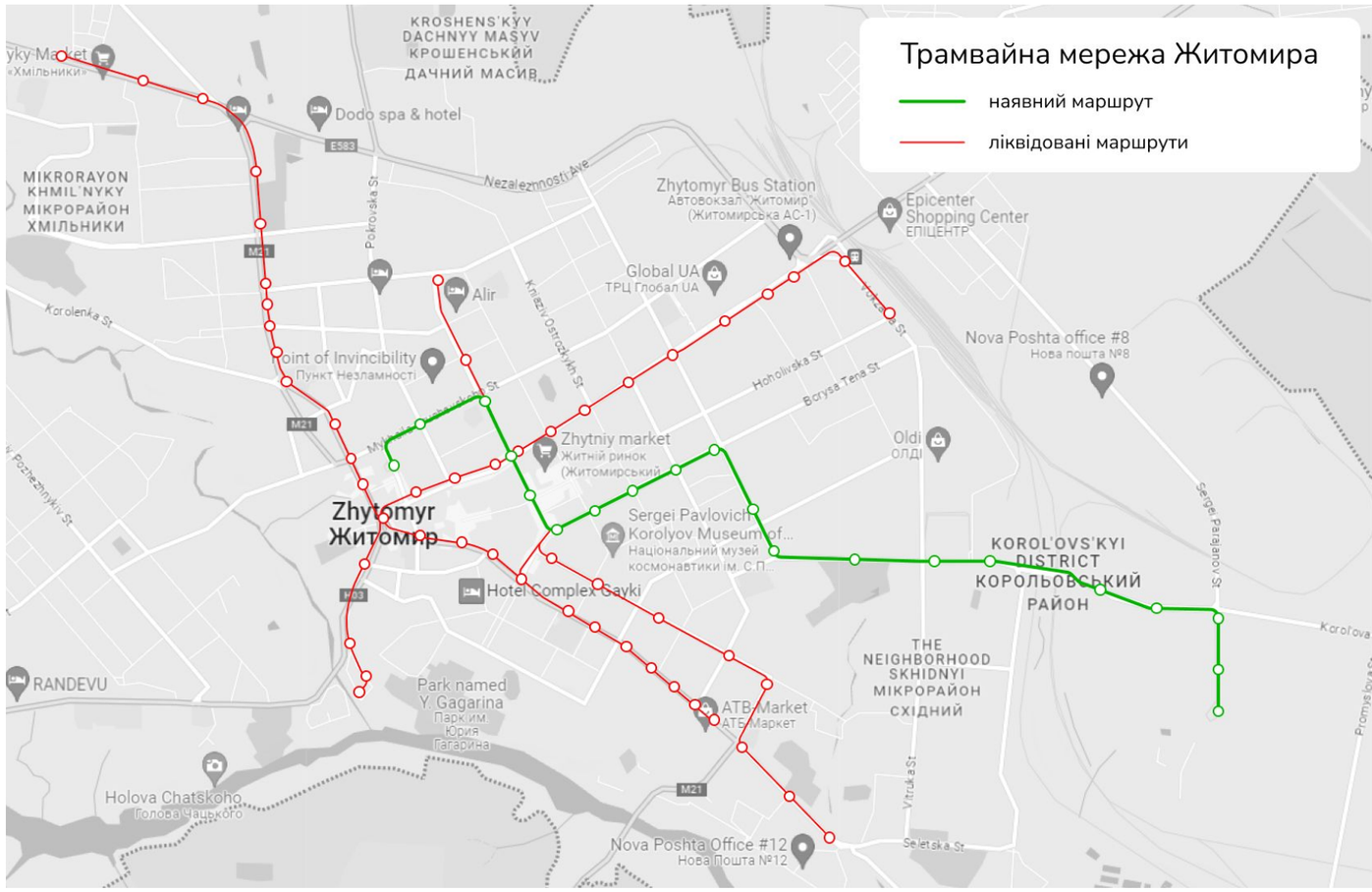
Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
T	Maidan Peremohy - Flax mill	**13,5**	**2,51**	**399**



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Kamianske

Indicator	Numbers
Population:	231 915 (2020)
The date of opening:	1935
The length of the tracks:	77.2 km
Track gauge:	1524 mm
Number of depots:	1
Number of substations:	14
Number of passenger cars:	32

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Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
4	DKHZ - Odeska street	14,3	2,18	458
3	DMK square - Karnaukhivka village	13,6	2,01	498
2	DMK Square - Dunaiska Street	13,5	1,68	595
1	DMK Square - Serhiy Slisarenko Street	12,4	1,86	539
4	**Average values >>**	**13,4**	**1,93**	**522**

Vinnytsia

Indicator	Numbers
Population:	370 707 (2020)
The date of opening:	1913
The length of the tracks:	44 km
Track gauge:	1000 mm
Number of depots:	1
Number of substations:	20
Number of passenger cars:	144

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Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
6	Railway station - Vyshenka	14,2	2,00	502
4	Railway station - Barske highway	13,9	1,99	504
3	Vyshenka - Electromerezha	13,0	2,33	431
1	Railway station - Electromerezha	13,0	1,97	510
2	Vyshenka - Barske highway	12,9	2,33	429
5	Electromerezha - Barske highway	12,1	2,26	442
6	**Average values >>**	**13,2**	**2,15**	**470**

Mykolaiv

Indicator	Numbers
Population:	480 080 (2020)
The date of opening:	1915
The length of the tracks:	69.6 km
Track gauge:	1524 mm
Number of depots:	1
Number of substations:	22
Number of passenger cars:	48

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Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
6	Industrial zone - Central market	12,7	2,52	398
10	Industrial zone - Shyroka Balka	12,5	2,73	368
7	Shyroka Balka - Central Market	12,5	2,49	402
1	Shyroka Balka - Yacht Club	12,3	2,63	380
3	Black Sea Shipbuilding Plant - 10a Viyskova	12,0	2,73	367
11	10th Viyskova - Central Market	11,9	3,10	323
6	**Average values >>**	**12,3**	**2,70**	**373**

Konotop

Indicator	Numbers
Population:	85 603 (2020)
The date of opening:	1949
The length of the tracks:	27.8 km
Track gauge:	1524 mm
Number of depots:	1
Number of substations:	2
Number of passenger cars:	21

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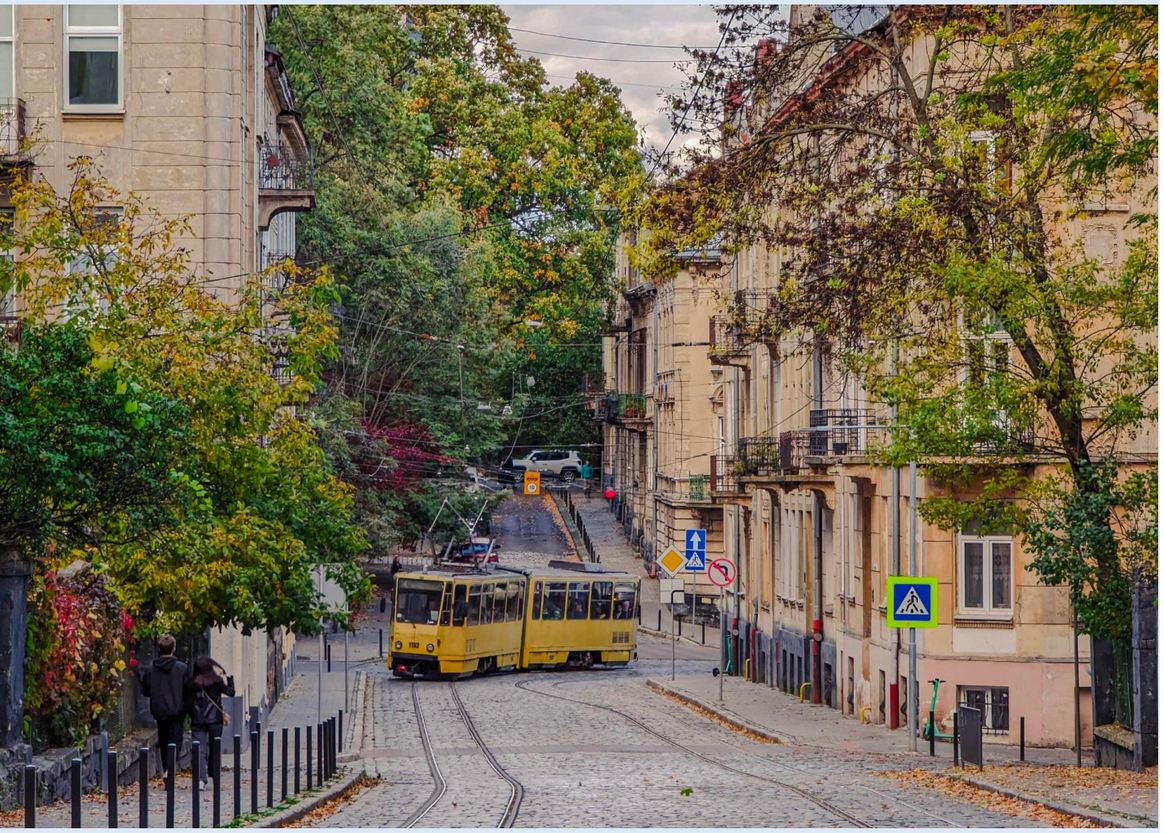
Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
2	Petliury Street - Motordetal plant	13,4	2,17	462
3	Depovska Street - KVRZ settlement	12,1	2,80	358
1	Depovska Street - Zahrebellia	11,2	2,46	406
3	**Average values >>**	**12,2**	**2,48**	**408**

Lviv

Indicator	Numbers
Population:	724 314 (2020)
The date of opening:	1894
The length of the tracks:	81.8 km
Track gauge:	1000 mm
Number of depots:	2
Number of substations:	20
Number of passenger cars:	143



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Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
8	Soborna Square - Vernadskoho	14,9	1,87	535
4	Railway station - Vernadskoho	13,3	1,95	513
2	Konovaltsia - Pasichna	12,2	2,21	452
6	Railway station - Mykolaichuka	11,8	2,21	455
3	Soborna Square - Aqua Park	11,6	1,79	559
7	Tatarbunarska - Pohulianka	11,3	2,07	486
1	Railway station -Pohulianka	11,1	2,16	465
9	Railway station - Torfiana	10,5	2,29	436
8	**Average values >>**	**12,1**	**2,07**	**488**

Druzhkivka

Indicator	Numbers
Population:	55 984 (2020)
The date of opening:	1945
The length of the tracks:	26.4 km
Track gauge:	1524 mm
Number of depots:	1
Number of substations:	2
Number of passenger cars:	13

Routes		Rated speed, km/h	Frequency of stops, for every 1000 m	Average distance between stops
№	terminus A - terminus B	Acc. to schedule	Number of stops	Metres
1	DFZ - Railway station	11,9	1,12	893
2	Central Medical Hospital - Mashynobudivnykiv neighbourhood	11,8	2,55	392
4	ATB - Mashynobudivnykiv neighbourhood	11,6	3,15	317
3	**Average values >>**	**11,8**	**2,27**	**534**

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Trams in Kyiv. Photo by: Oleksandr Shutyuk

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