UITP ADVANCING PUBLIC TRANSPORT

STATISTICS BRIEF

GLOBAL TROLLEYBUS FIGURES 2025

MAY | 2025

INTRODUCTION

Urban public transport systems worldwide are evolving to meet the demands of modern cities, where sustainability, efficiency, and accessibility are paramount. Among the range of public transport modes, trolleybuses represent a unique blend of historical significance and contemporary relevance. This brief, prepared by UITP with the Trolleybus Committee in the driver seat, provides a global data collection, a state of play and an in-depth analysis of the current state of trolleybus networks globally, focusing on the big numbers, facts and figures.

Trolleybuses offer an emission-free alternative to traditional buses, aligning closely with global efforts to reduce greenhouse gas emissions and promote sustainable development. As cities increasingly prioritise cleaner energy sources and decarbonisation goals, trolleybus systems stand out as a viable and proven solution.

In this statistics brief, we present a representative overview of several cities which reflect state-of-the-art trolleybus systems worldwide. By analysing these networks, we aim to highlight their current status, operational characteristics and role in advancing sustainable urban mobility. The selected cities represent a diverse range of geographies, showcasing the versatility and adaptability of trolleybuses in different urban contexts. Through this brief, we will explore key performance indicators, innovations such as In Motion Charging, eBRT solutions, and the integration of trolleybuses into multimodal transport systems.

In motion charging trolleybus in Bergen, Norway

GLOBAL PRESENCE AND DEVELOPMENT

Over the past two decades, the global presence of trolleybuses has experienced a significant evolution, reflecting advancements in technology, shifting urban priorities, and sustainability imperatives. Today, trolleybus systems operate in over 40 countries and about 260 cities across Eurasia, Europe, Asia-Pacific, and Latin and North America, with notable networks in cities such as Zurich, San Francisco, Seattle, Athens, Bucharest, Mexico City, Beijing, Shanghai, and others. Their popularity is particularly strong and anchored in regions with a historical reliance on electric transport and a renewed commitment to decarbonising urban mobility.

Recent years have seen a resurgence of interest in trolleybuses, driven by the global push for greener transport solutions. Advances in energy storage and battery technology have introduced the concept of **In Motion Charging (IMC),** a transformative innovation in the trolleybus industry. In Motion Charging trolleybuses combine traditional overhead power supply with on-board battery systems, allowing them to operate seamlessly on sections of the route without overhead wires, especially in the city centre. This hybrid capability reduces the need for extensive and costly fixed infrastructure while maintaining the benefits of zero-emission operation.

IMC technology is enabling cities to expand trolleybus networks into underserved or newly developed areas without the constraints of overhead wiring, providing greater operational flexibility. Cities such as Zurich, Prague, and Shanghai have successfully implemented IMC-equipped fleets, proving their feasibility and efficiency. These systems also reduce visual pollution in urban environments, addressing one of the traditional drawbacks of trolleybuses.

As cities strive to meet ambitious climate goals, the global development of trolleybuses, particularly with IMC advancements and the implementation of this transport mode on Bus Rapid Transit routes, showcases their potential as a sustainable, adaptable, and forward-thinking solution for urban transit. This innovative approach reinforces their relevance in modern transport systems, bridging the gap between traditional electric transit and the demands of 21st century cities.

TROLLEYBUS NETWORKS WORLDWIDE: A NUMERICAL OVERVIEW (2024)

As of December 2024, there were about **260 trolleybus systems** operating across the world, with a total fleet of **22,137 trolleybuses.**

- **EU, Switzerland and Norway:** 85 systems, **5,390 trolleybuses.**
- **Other countries worldwide:** 172 systems, **16,747 trolleybuses.**

Table 1

REGION	NO. OF CITIES	LENGTH OF INFRASTRUCTURE (KM)	NO. OF VEHICLES	NO. OF LINES (ROUTES)
Eurasia	128: Russia (75), Ukraine (35), Belarus, Moldova, Georgia, Armenia, Central Asian countries, Turkey (2)	17,335km	11,823	1,488
Europe	85 (EU+Switzerland+Norway)	5,700km	5,390	517
Asia Pacific	27: China (13), Mongolia (1), North Korea (13)	2,635km	3,086	99
Latin America	13 (Argentina, Brazil, Chile, Ecuador, Mexico)	1,820km	1,029	95
North America	5: USA (4) Canada (1)	785km	797	53
MENA	1: Saudi Arabia	4km	12	1
Total	**257**	**28,279km**	**22,137**	**2,253**

FLEET COMPOSITION AND TRENDS

Largest networks:

- **Beijing** is the city with **the largest fleet worldwide (1,044** trolleybuses in operation). There are **31 trolleybus routes** with **a total length of 465km.**
- **Russia** remains the largest operator at a single country level, with **5,549 active trolleybuses across 75 cities. Saint Petersburg** has the largest fleet in Russia composed of **759 trolleybuses.**
- **Ukraine** is next, with 35 systems and **2,479 operational trolleybuses.**

Largest EU fleets:

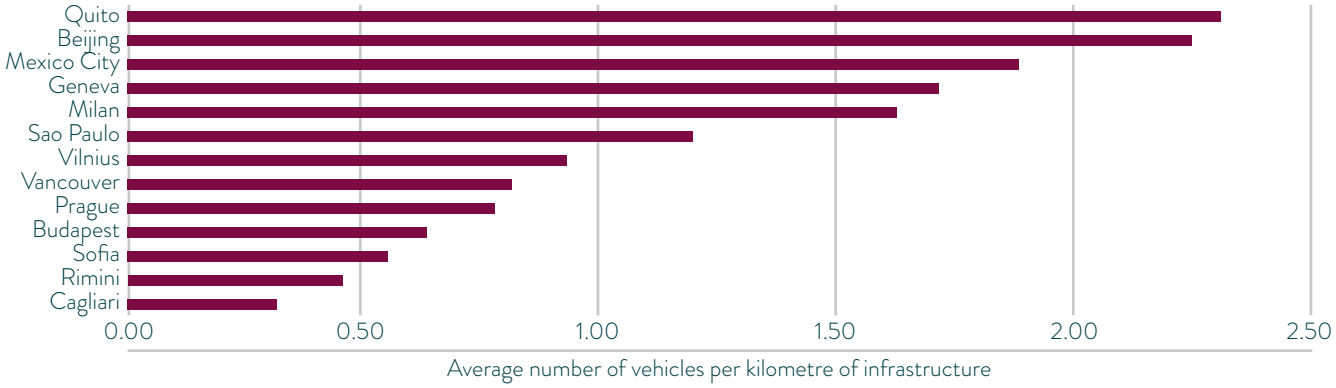
- Vilnius, Lithuania: **270 trolleybuses.**
- Bucharest, Romania: **269 trolleybuses.**
- Athens, Greece: **267 trolleybuses.**
- Budapest, Hungary: **141 trolleybuses.**
- Milan, Italy: **130 trolleybuses.**
- Sofia, Bulgaria: **124 trolleybuses.**
- Salzburg, Austria: **118 trolleybuses.**
- Gdynia, Poland: **105 trolleybuses.**
- Lublin, Poland: **99 trolleybuses.**
- Lyon, France: **82 trolleybuses.**
- Solingen, Germany: **64 trolleybuses.**
- **Smallest European networks:**

  Many cities operate a trolleybus minimal system and fleet, such as **Landskrona, Sweden** with **4 battery trolleybuses,** comprised of one from 2013 (54kWh) and three from 2024 (60kWh), and **Bergen, Norway (10 articulated 18m trolleybuses** operating with a 55kWh battery, also off-wire since 2021, on a total length of 14km line of which 12km is electrified).

Trolleybuses per network:

- Average **trolleybuses per network: 86.**
- Average **trolleybuses per line: 11.**

Figure 1: Number of vehicles per network length



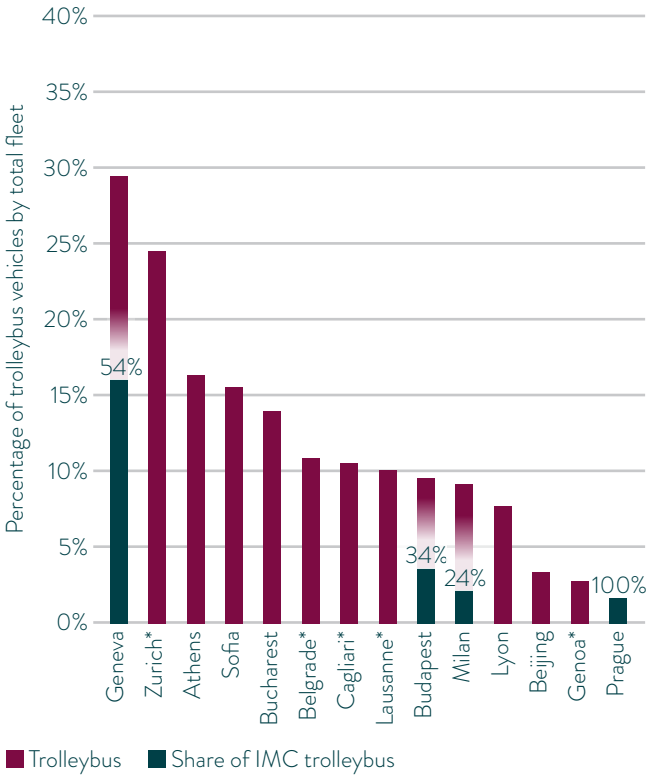
TRENDS IN ELECTRIFICATION & MODERNISATION

- **New trolleybuses put into service:**
  - The number of new vehicles put into service in Europe in 2024 rose to a record high of 372 units. In the last 15 years, the number of new vehicles has only exceeded 300 twice, in 2020 (316 units) and 2014 (324 units).
  - On the European market, 63% of trolleybuses put into service in 2024 were produced by Solaris, while SOR took second place with 110 units delivered (30%). With 27 units going into operation in 2024, Hess retained third place in the delivery ranking (7%). Of the 372 units that went into service in 2024, the majority of vehicles were solo vehicles of 12m length (59%) and were equipped with a battery (as many as 97%).
  - The Trolleybus sector is expected to grow in the next few years. By aggregating data from 10 European operators involved in the Bus Fleet Survey 2023, they expect to increase the trolleybus fleet by 120% in 2030 compared to 2022. These figures cover **Switzerland:** Lausanne, Zurich, La Chaux-de-Fonds; **Romania:** Baia Mare, Brasov; **Czech Republic:** Prague; **Italy:** Cagliari; **Serbia:** Belgrade; **Hungary:** Debrecen; **Bulgaria:** Pleven.
  - **eBRT solutions** are becoming increasingly popular in trolleybus transport. Take the example of **Mexico City,** which prides itself on a renewed fleet of 442 trolleybuses operating on 261.6km. After positive results from the Line 10 'trolebus elevado', a dedicated elevated eBRT trolleybus route, in 2025 Mexico City will inaugurate Line 11, spanning over 18km as an eBRT system using articulated trolleybuses. The result will be to substantially reduce travel times and make the most of the trolleybus mode.

Battery-Operated Trolleybuses:

- Many systems have integrated battery-powered trolleybuses to increase route flexibility.
- The share of battery-powered trolleybuses has risen again and in the EU, for example, standalone now accounts for 38% of the total number of trolleybuses.
- Of these 372 new trolleybuses that went into service in 2024, only 12 units were without a battery.
- Cities such as **Geneva, Milan, Gdynia, Prague, and Budapest** have significant fleets with partial battery operation.

Figure 2: Share of trolleybus vehicles out of total bus fleet.
**Data refers to 2022*



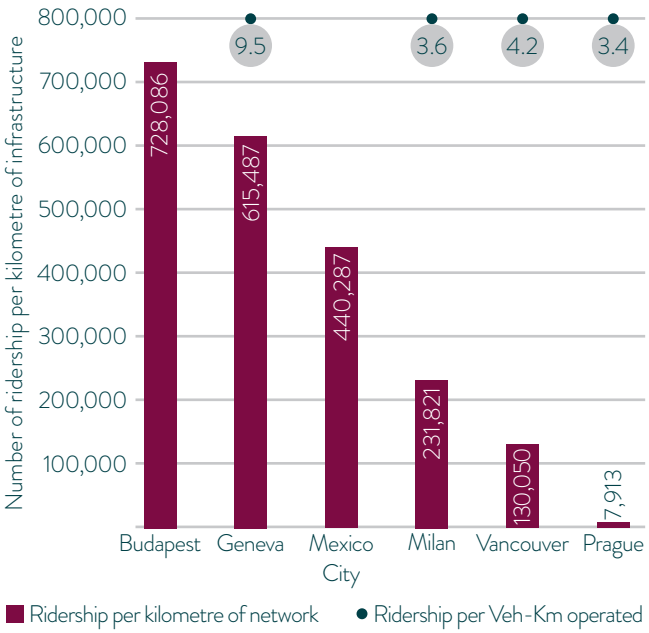
Declining Systems:

- Some cities have recently **discontinued trolleybus operations,** such as **Boston,** USA, **Montevideo,** Uruguay, and **Avellino,** Italy – one of the shortest-lived trolleybus systems in history (it opened 1 April 2023 and discontinued 7 July the same year).
- Systems in Ukraine and Russia have seen a **drop in fleet numbers.**

New and revived networks:

- Some cities, such as **Prague, Naples, Arnhem, Tallinn, Nancy, and Rome,** have been reviving or expanding their trolleybus fleets.

Figure 3: Annual ridership



Trolleybuses continue to play a key role in urban public transport, especially in Europe and post-Soviet countries. While some networks are shrinking, modernisation efforts with battery-assisted trolleybuses are providing new opportunities for sustainable transport solutions.

Trolleybus in Beijing, China

PRESENCE AND DEVELOPMENT IN SELECTED TROLLEYBUS CITIES

Data on particular cities provided by Trolleybus Committee Members through Benchmarking Working Group survey:

Vancouver, Canada

Milan, Italy

VANCOUVER, CANADA TROLLEYBUS SYSTEM

- **Network:** 320km of bidirectional segregated infrastructure with 20 rectifier stations.
- **Fleet:** 261 trolleybuses, with 124 (40ft/12m) and 39 (60ft/18m) in peak operation.
- **Operations:**
  - Annual trolleybus-km: 10.1 million.
  - Average commercial speed: 13.38km/h (12.37km/h in peak hours).
  - Average headway: 11 min (peak), 15 min (off-peak).
- **Staff:**
  - 662 employees involved in trolleybus operation.
  - 525 drivers.
  - 6 weeks of basic driver training.

MILAN, ITALY TROLLEYBUS SYSTEM

- **Network:** 77.6km of bidirectional segregated infrastructure with 26 substations, 13 for trolleybuses (some of them are exclusive to the trolleybus network, others are shared with the overhead tram network and the opportunity charger for e-bus).
- **Fleet:** 130 trolleybuses, with 100 in peak operation.
- **Operations:**
  - Annual trolleybus-km: 5 million.
  - Average commercial speed: 13km/h (11km/h in peak hours).
  - Average headway: 4 min (peak), 7 min (off-peak).
- **Staff:**
  - 152 employees involved in trolleybus operation.
  - 2.5 months of basic driver training.

Sofia, Bulgaria

SOFIA, BULGARIA TROLLEYBUS SYSTEM

- **Network:** 111.27km of bidirectional segregated infrastructure with 24 rectifier stations.
- **Fleet:** 124 trolleybuses, with 95 in peak operation.
- **Operations:**
  - Annual trolleybus-km: 5.7 million.
  - Average commercial speed: 18km/h (15km/h in peak hours).
  - Average headway: 13-19 min (peak), 14-20 min (off-peak).
- **Staff:**
  - 499 employees involved in trolleybus operation.
  - 263 drivers, 22 hours from C-D category, 26 hours from D–D (103) category of basic driver training.

Budapest, Hungary

BUDAPEST, HUNGARY TROLLEYBUS SYSTEM

- **Network:** 111.8km of bidirectional segregated infrastructure with 11 terminus stops.
- **Fleet:** 141 trolleybuses, with 110 in peak operation.
- **Operations:**
  - Average commercial speed: 14.6km/h (16.4km/h in peak hours).
  - Average headway: 9 min (peak), 12min (off-peak).
- **Staff:**
  - 385 employees involved in trolleybus operation.
  - 290 drivers.
  - 127 days of basic driver training.

Cagliari, Italy

CAGLIARI, ITALY TROLLEYBUS SYSTEM

- **Network:** 45.9km of bidirectional segregated infrastructure with 5 rectifier stations.
- **Fleet:** 30 trolleybuses, with 25 in peak operation.
- **Operations:**
  - Annual trolleybus-km: 680,000 (year 2024).
  - Average commercial speed: 16km/h, 13km/h (in peak hours).
  - Average headway: 9 min (peak), 12-15 min (off-peak).
- **Staff:**
  - 95 employees involved in trolleybus operation.
  - 80 drivers.
  - 6 days of basic driver training.

Vilnius, Lithuania

VILNIUS, LITHUANIA TROLLEYBUS SYSTEM

- **Network:** 144km of bidirectional segregated infrastructure with 19 rectifier stations.
- **Fleet:** 270 trolleybuses, with 176 in peak operation.
- **Operations:**
  - Annual trolleybus-km: 10.2 million.
  - Average commercial speed: 18km/h (12km/h in peak hours).
  - Average headway: 8 min (peak), 5 min (off-peak).
- **Staff:**
  - 531 employees involved in trolleybus operation.
  - 391 drivers.
  - 30 working days of basic driver training.

Riga, Latvia

RIGA, LATVIA TROLLEYBUS SYSTEM

- **Network:** 205km of bidirectional segregated infrastructure with 29 rectifier stations (12 terminus stations).
- **Fleet:** 225 trolleybuses, with 150 in peak operation.
- **Operations:**
  - Annual trolleybus-km: 10.1 million.
  - Average commercial speed: 15km/h (16km/h in peak hours).
  - Average headway: 18 min (peak, working days), 25 min (off-peak, non-working days).
- **Staff:**
  - 603 employees involved in trolleybus operation.
  - 432 drivers.
  - 120 days of basic driver training.

Shanghai, China

SHANGHAI, CHINA TROLLEYBUS SYSTEM

- **Network:** 332km of bidirectional segregated infrastructure with 24 rectifier stations.
- **Fleet:** 126 trolleybuses, with 126 in peak operation.
- **Operations:**
  - Annual trolleybus km: 5,263,900.
  - Average commercial speed: 12.3km/h.
  - Average headway: 7 min (peak), 10 min (off-peak).
- **Staff:**
  - 205 drivers.

**The number of drivers provided by some of these cities also includes universal drivers for other vehicles such trolleybuses, buses, and e-buses.*

Guangzhou, China

GUANGZHOU, CHINA TROLLEYBUS SYSTEM

- **Network:** 130km of bidirectional segregated infrastructure with 8 rectifier stations.
- **Fleet:** 102 trolleybuses, with 97 in peak operation.
- **Operations:**
  - Annual trolleybus-km: 4.4 million.
  - Average commercial speed: 11.4km/h (11.7km/h in peak hours).
  - Average headway: 5-10 min (peak), 10-15 min (off-peak).
- **Staff:**
  - 286 employees involved in trolleybus operation.
  - 202 drivers.
  - 24 days of basic driver training.

Gdynia, Poland

EBRT WITHIN THE HORIZON EUROPE RESEARCH AND INNOVATION PROGRAMME

Home — eBRT2030

Bus rapid transit (BRT) is one of the solutions in urban transport that can help improve the sustainability of cities as well as provide a modern, reliable and high-quality service to citizens. Recently, the growing uptake of BRTs worldwide has been combined with an increased adoption of zero-emission buses.

Electric Bus Rapid Transit (eBRT) systems represent a sustainable, efficient, and modern solution that is increasingly combined with new technology and innovations. Among various eBRT implementations worldwide, trolleybuses offer a unique advantage by combining the flexibility of buses with the environmental benefits of electric propulsion. UITP-led research and innovation projects, such as eBRT2030, aim at building the next generation of European eBRT systems with an evolution towards automation, connectivity and integration with other transport modes.

This chapter examines three cities, more specifically Prague, Athens, and Rimini, where trolleybuses have been successfully integrated into public transport networks, illustrating different operational models and challenges. Additionally, it will present how IMC trolleybuses can be effectively integrated into modern and efficient eBRT trunk lines as already occurred in Rimini and Prague. A pilot project will be launched in Athens.

Prague, Czech Republic

PRAGUE: REVIVING THE TROLLEYBUS TRADITION

Prague, the capital of the Czech Republic, has a long history of trolleybuses dating back to 1936. However, the system was gradually phased out by 1972 in favour of diesel buses and trams. Recent efforts to reduce carbon emissions and improve public transport efficiency have led to the reintroduction of trolleybuses under an eBRT model.

On 6 March 2025, DPP put in operation its newly built trolleybus eBRT line in connecting the city to Václav Havel International airport. Partially financed by the eBRT2030 project, the new 59 line deploys 25-metre double-articulated trolleybuses, the longest in the Czech Republic, thus increasing the capacity by about 30%. The IMC trolleybuses will save approximately 1,300 tonnes of CO_2 per year.

Key developments:

- In 2017, the Prague Public Transport Company (DPP) launched a pilot trolleybus project on Route 140, using modern battery-assisted trolleybuses.
- The city aims to electrify key bus routes by leveraging partial catenary charging and in-motion charging technologies.
- Prague's trolleybus network is set to expand, with plans for longer routes connecting suburban areas to the city centre, reducing reliance on diesel buses.

Lines: 59, 58

The lines are served by state-of-the-art and longest available on the market 20 Skoda-Solaris impressive 24 metre, 4-axles battery t-buses with a passenger capacity of 179, reaching a maximum speed of 70km/h with a passenger capacity of 179. The traction battery's capacity is 60kWh.

On 3 February 2025, the Prague public transport operator Dopravní podnik hl. m. Prahy, akciová společnost (DPP) published a further public tender for the delivery of up to 180 additional low-floor battery trolleybuses, 90 of which will be articulated buses and 90 standard buses. DPP will conclude a five-year framework agreement with the successful bidder. The estimated total value of the public contract is 3.465 billion Czech koruna (CZK; ~€139 million). DPP will apply for EU funding for the purchase of these vehicles.

- **Total distance km:** 18km, 9km each way.
- **Number of stops:** 10.
- **Number of depots:** 1.
- **Fleet:** 20 double-articulated vehicles (23-25m).
- **Ridership passengers per day:** 20,000 (pre-eBRT capacity), with envisaged increase of 30%.

Infrastructure (750V DC) Charging rate in motion > 50% Possibility of charging (static) (2x terminus + depot).

ATHENS: A WELL-ESTABLISHED TROLLEYBUS NETWORK

Athens, Greece, boasts one of the largest trolleybus networks in Europe, playing a crucial role in the city's public transport system. The trolleybus network, operated by OSY S.A., provides an essential zero-emission alternative to diesel buses, especially in the congested urban core.

Key features:

- The Athens trolleybus network consists of over 20 routes, covering approximately 350km off-wire.
- The fleet includes modern, battery-assisted trolleybuses capable of operating off-wire for extended distances.
- The network connects key districts and suburban areas, reducing congestion and pollution in the historic city centre.

In line with the ambition of the city to decarbonise its bus fleet and at the same time implement innovations and provide an enhanced level of service to users, Athens will pilot a hybrid charging concept for electric Bus Rapid Transit (eBRT) systems in the framework of the eBRT2030 project. The objective is to eventually deploy a combination of electric buses, trolleybuses, and hybrid e-buses that can take advantage of existing trolleybus infrastructure for in-route charging to upgrade a line in the historic Syggrou corridor that once served as a Bus Rapid Transit (BRT) route during the 2004 Athens Olympics. The line has a length of 4km.

Athens, Greece

RIMINI: A SMALL-SCALE EBRT SUCCESS STORY

Rimini, historically a popular Italian tourist destination, has embraced trolleybuses as a core component of its public transit strategy. The city's Metromare eBRT system, launched in 2019, combines the efficiency of a dedicated busway with the sustainability of electric trolleybuses and serves as a backbone of the region's public transport network.

System characteristics:

Metromare operates along a dedicated 9.8km corridor connecting Rimini train station to Riccione train station with a stop at the airport too.

The system employs IMC 18 metre battery-assisted trolleybuses, allowing for partial off-wire operation. The main driving force is transmitted through a 750V power line. Dedicated lanes and priority signalling ensure high-frequency service with minimal delays. The operator is implementing innovations to further customer experience and safety and to reduce costs.

- **Total distance km:** 9.8km one-way, for a 19.8km total length of the segregated BRT system, and 160m outside the roundabout for a total of 20.1km.
- **Number of stops:** 17, including terminus.
- **Number of depots:** 1, with distance from terminus to the depot 2.5km.
- **Fleet:** 9 articulated trolleybuses (6 in operation during peak hours).

The cases of Prague, Athens, and Rimini illustrate diverse approaches to eBRT trolleybus implementation. While Prague is reviving its trolleybus network with modern technology, Athens maintains an extensive and well-integrated system, and Rimini showcases a compact yet highly effective model. Each city provides valuable insights into the operational, financial, and infrastructural considerations necessary for the successful deployment of trolleybus-based eBRT systems. As urban areas worldwide seek sustainable mobility solutions, these examples highlight the potential of trolleybuses to play a key role in the future of public transport.

Rimini, Italy

IMC TROLLEYBUS DEMAND

The demand for In Motion Charging trolleybuses has grown significantly in recent years as cities seek sustainable and flexible public transport solutions. This innovation reduces dependency on extensive infrastructure, lowers operational costs, and supports decarbonisation goals. With an increasing emphasis on reducing emissions and enhancing transit efficiency, IMC trolleybuses are becoming a preferred choice for modernising trolleybus fleets globally. Their growing adoption underscores their role in shaping the future of urban mobility.

We see a growing global interest in **In Motion Charging** and **Bus Rapid Transit trolleybus concepts.** IMC technology, which enables trolleybuses to charge their batteries while connected to overhead wires and operate off-wire when needed, has significantly enhanced operational flexibility, reduced infrastructure costs, and expanded the feasibility of trolleybus networks in urban environments.

Simultaneously, the **BRT concept** is increasingly being integrated into trolleybus systems, improving service efficiency, reliability, and passenger experience. By incorporating **dedicated lanes, priority signalling, and modern vehicle technology,** trolleybus-based BRT solutions provide a **sustainable, high-capacity** alternative to traditional diesel and battery-electric buses—especially for cities striving to reduce emissions and enhance public transport networks.

As urban areas worldwide focus on **decarbonising transport and improving mobility,** the convergence of **IMC trolleybuses and BRT principles** presents a compelling opportunity to deliver **cleaner, more efficient, and adaptable** public transit solutions.

UITP Trolleybus Committee released the following publications since 2019:

In Motion charging trolleybus systems, 2024

Trolleybuses: Wires becoming charging infrastructure for in motion charging, 2023

Infrastructure for In Motion charging trolleybus systems, 2021

In Motion charging: innovative trolleybus, 2019

DEFINITION AND METHODOLOGY

This is an official Statistics Brief of UITP, the International Association of Public Transport. UITP represents the interests of key players in the public transport sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport worldwide.

Due to the diverse climatic conditions and temperature variations across cities operating trolleybuses, as well as the complexities in obtaining accurate and segregated power consumption data—particularly in cities where trolleybuses and trams share substations—this information has not been included in this Statistics Brief to maintain data consistency and reliability.

The data collected for this statistics brief is subject to change over time. Updates may occur as new information becomes available.

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The working group included the following members:

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- Gianluca Costantini
- Rychard Kayser
- Stefano Sirri (Rimini)
- Klaus Peter Canavan

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IMC abbreviation — trademark belongs to Kiepe Electric, Member of UITP and member of UITP Trolleybus Committee, Industry Observer.

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