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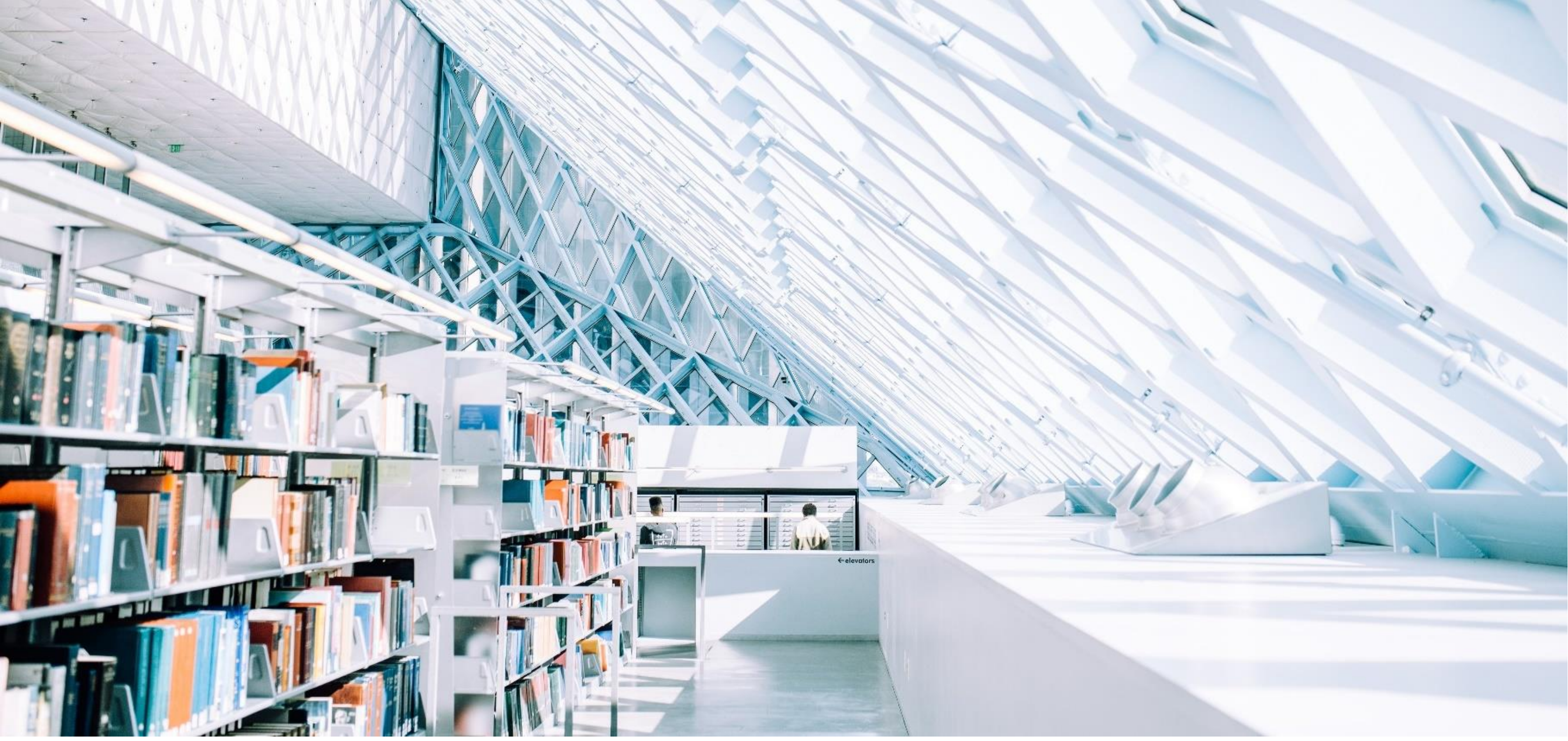
MONORAIL AND AUTOMATED PEOPLE MOVER – GLOBAL MARKET TRENDS

Forecast, Installed Base, Manufacturers, Infrastructure and Rolling Stock Projects

2025



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Forecast, Installed Base, Manufacturers, Infrastructure and Rolling Stock Projects

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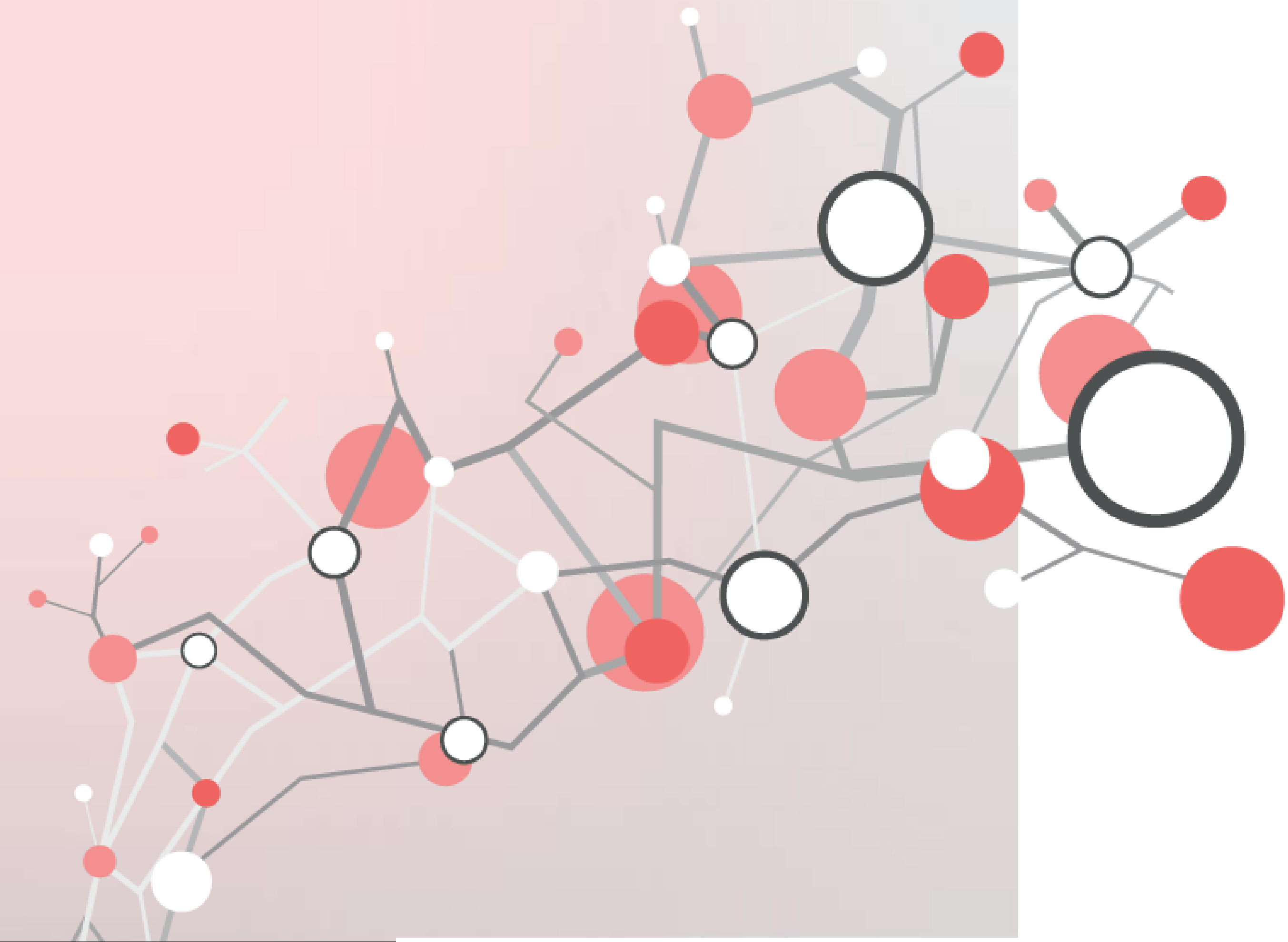

1 Executive Summary

Executive Summary

Market Relevance and Structural Characteristics

Monorail and Automated People Mover (APM) systems form a clearly delineated, highly specialised market segment operating outside the conventional logics of mass rapid transit. Yet precisely because of their narrow functional scope, these systems respond with surgical precision to some of the most acute infrastructure challenges of the early 21st century: Space constraints, automation needs, and the rising cost and complexity of labour-intensive transport operations.

Although they are not a substitute for full metro systems or heavy rail, monorails and automated people movers excel in environments where conventional modes of transport have reached their economic or spatial limits. Their elevated or underground alignment, coupled with unattended driverless operation (typically Grade of Automation 4), allows them to operate reliably in narrow corridors, highly controlled zones, or environments with minimal staffing capacity. This applies above all to:

Urban monorails serving as medium-capacity feeder or trunk lines in dense metropolitan areas

Airport APMs linking terminals, parking structures, and multimodal nodes within spatially constrained airport grounds

Both applications follow distinct development logics but share technical DNA: Rubber-tyred or cable-hauled systems, short headways, lightweight guideways, and turnkey delivery models. Their relevance is amplified in regions where land acquisition is complex, workforce availability is limited, and operational stability is prioritised over peak capacity.

From a market perspective, the segment is best understood not through the number of systems alone, but through its operational intensity, lifecycle implications, and its embeddedness in long-term capital programmes. Most systems are delivered through fully integrated contracts (EPC + O&M) and typically run on 20- to 30-year operating lifecycles. For this reason, many global transport integrators – such as Siemens, Hitachi or Alstom – regard the segment as a strategic long-cycle business area, despite its modest global footprint.

The relevance of monorail and APM systems is further underlined by their growing role in hybrid networks. In many emerging megacities, they complement conventional metro or LRT lines, filling network gaps with automated shuttle or elevated services. In airports, APMs are increasingly integrated into larger access strategies that link air travel with regional rail, metro and bus corridors – playing a pivotal role in intermodal connectivity.

Despite their niche status, these systems have evolved into a structurally distinct market layer: Not merely as technological novelties, but as infrastructure elements with high reliability, defined economic rationales, and dedicated supplier ecosystems. As urbanisation accelerates and airport capacity is redefined in the post-pandemic era, the strategic importance of airports is set to grow, albeit selectively and subject to strict financial and operational criteria.

[…]

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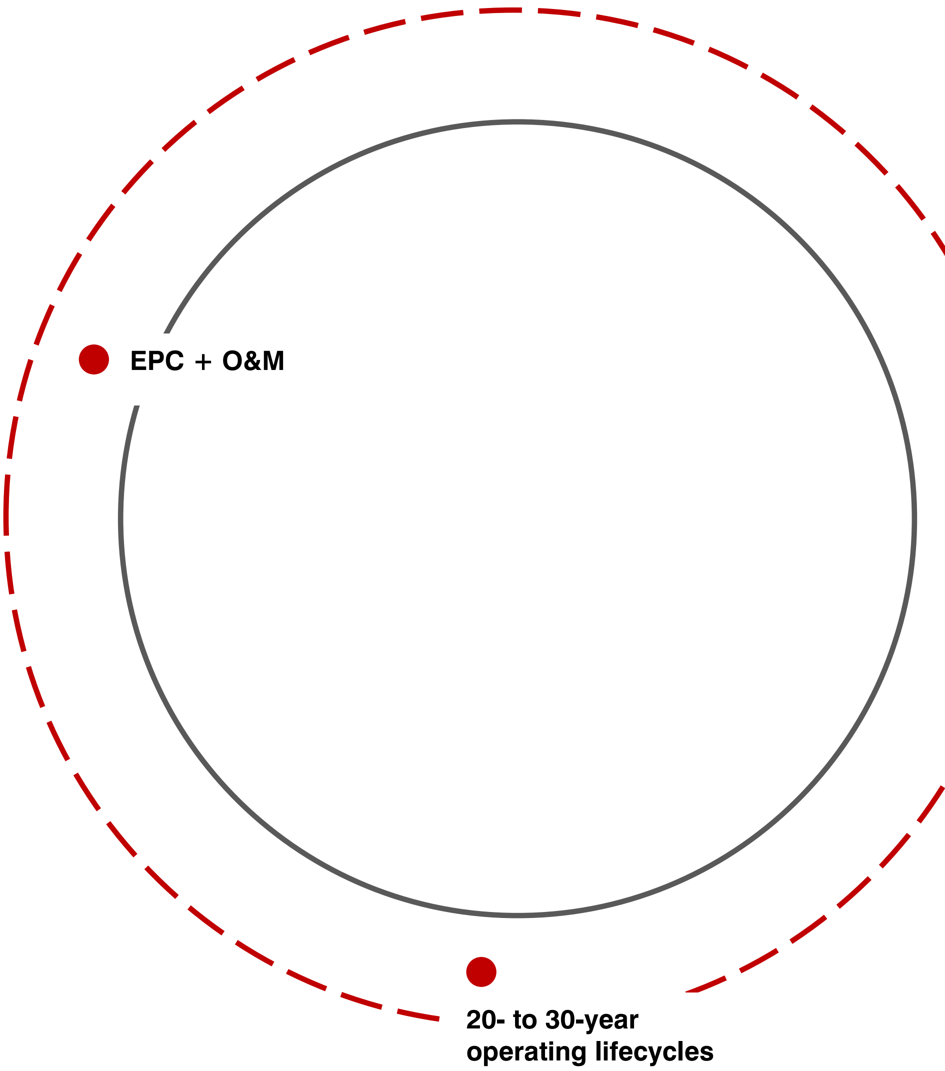

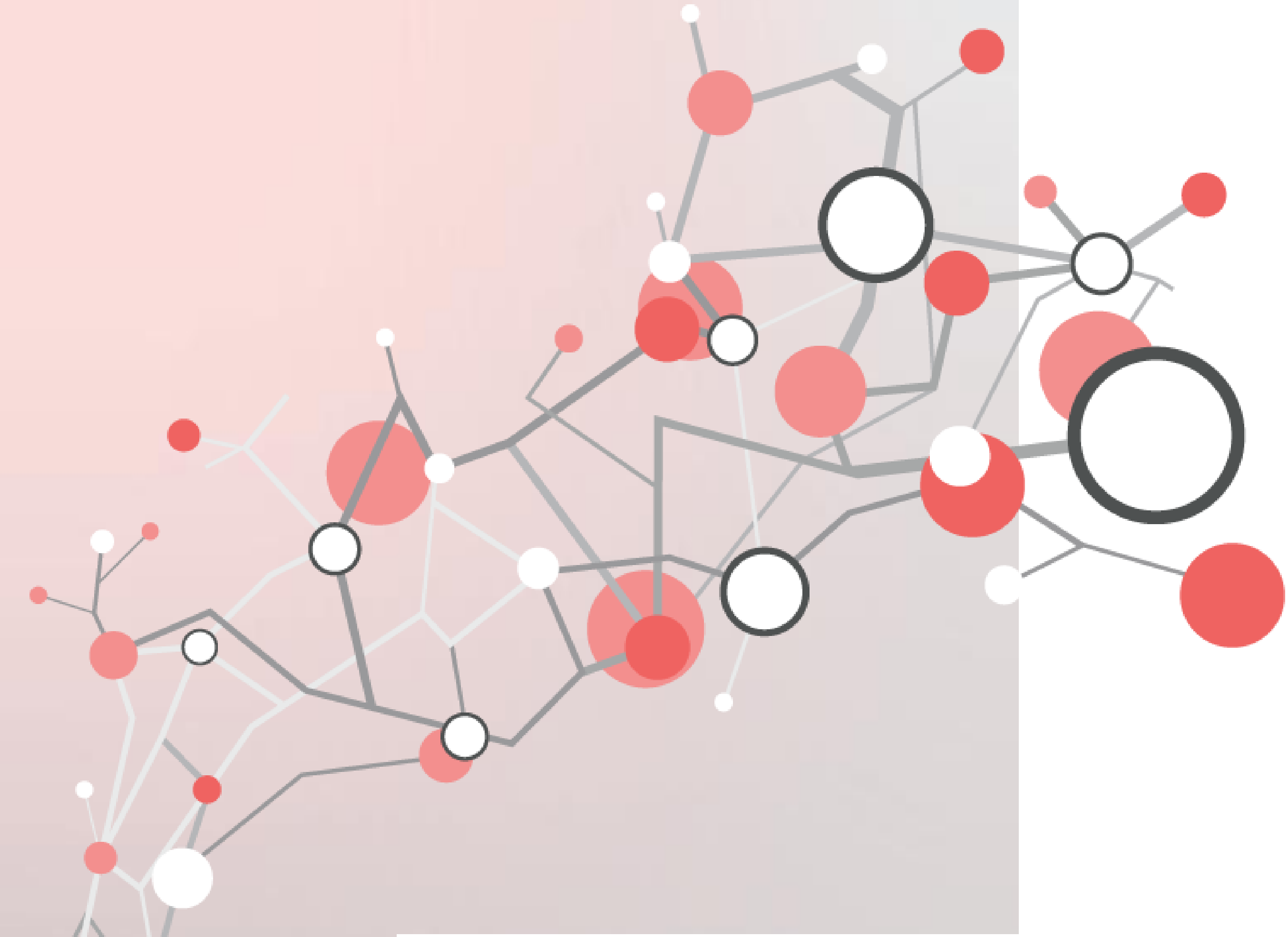

2 Global Market Overview

2 Monorail

2.1 Market Overview

The global market for monorail systems represents a specialised yet increasingly dynamic segment of the automated urban transport sector. As of 2024, 41 monorail systems are in operation worldwide, comprising over XX km of infrastructure and a fleet of approximately XX cars. While modest in volume compared to metro or light rail systems, monorails occupy a strategic niche in cities and regions where space constraints, terrain limitations or lower construction costs favour an elevated and fully automated solution. Their appeal lies in their ability to deliver medium to high-capacity transport with a lighter footprint, combined with strong visual integration into the urban landscape.

Although monorails can be found in both public transport and airport contexts, most installed systems are designed for urban public transport. As of 2024, more than 85% of the global monorail route length and almost 90% of vehicles are used in public networks, while airport applications remain limited and are typically confined to short-distance shuttle services (e.g. Tokyo, Newark). This distinguishes the monorail segment from APM systems, where airport deployment is much more prevalent.

Monorail systems vary considerably in size and function. While many Asian networks span 15–35 km and operate multi-line configurations with hundreds of vehicles, installations in other world regions often consist of single lines under 10 km with modest fleets. The largest systems – such as Chongqing (China), Osaka (Japan), Bangkok (Thailand), and soon Cairo (Egypt) – are built to serve dense metropolitan corridors with high passenger volumes and integration into broader rail-based transport ecosystems. Conversely, smaller systems in Europe and North America tend to operate as complementary feeders or stand-alone connections, often in airport or special-use contexts.

From a technological standpoint, straddle-beam monorails dominate the market. These systems use rubber-tyred vehicles that ride on a single elevated concrete beam, allowing for tighter curves and steeper gradients than conventional rail. Suspended monorails, such as those in Wuppertal (Germany) and Chiba (Japan), represent a minority segment but continue to operate successfully. Most monorail fleets are fully automated and run under GoA 3 or GoA 4 standards. Vehicles typically operate in two- to six-car formations, with average capacities between 100 and 200 passengers per car, depending on design and use case.

Market	Number of Systems (in operation)	Infrastructure (in operation)		Fleet (in operation)	
		Length in km	Number of stations	Number of units	Number of cars
Asia					
Japan					
China					
Others					
North America					
USA					
Others					
Europe					
Africa / Middle East					
South & Central America					
CIS					
Australia & Pacific					
Total					

[…]

2.2 Infrastructure

Monorail systems have become an established component of urban transport planning in several cities, worldwide. They offer targeted solutions for specific infrastructure challenges, particularly where conventional rail systems may be limited by space, terrain or cost constraints. In recent years, interest in monorails has grown steadily, especially in rapidly urbanising regions where the need for elevated, automated and space-efficient transport solutions is increasing.

Distribution of Monorail systems worldwide by purpose (2024)

Source: SCI Database

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Figure 1: Distribution of Monorail systems worldwide (2024)

A global overview of installed monorail systems reveals a distinct geographical concentration. While the technology has been adopted in various parts of the world, most systems are in Asia. Here, dense urban environments, rapid population growth and strong institutional support have created favourable conditions for the deployment of elevated, automated transport solutions. In many cities, monorail infrastructure is not only accepted but strategically positioned as part of broader public transport expansion plans. The result is a dynamic regional market in which monorail systems are increasingly regarded as permanent, high-capacity additions to urban rail networks.

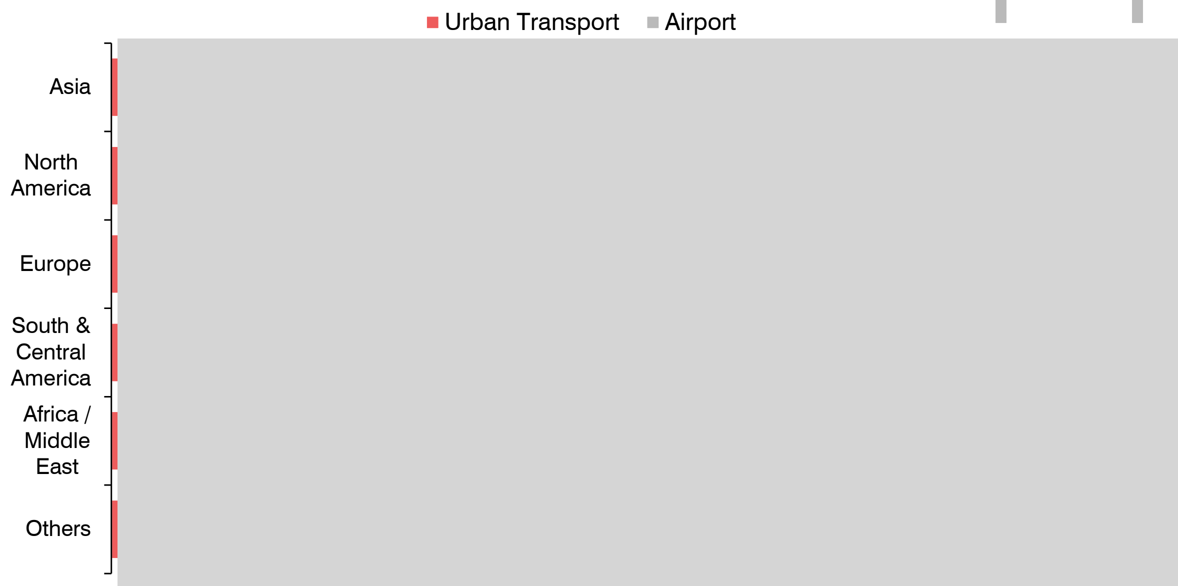
In contrast, monorail systems in other parts of the world tend to occupy more specific or limited roles. In Europe, North America, and parts of South America, deployments are fewer and generally smaller in scale. These systems are typically designed for clearly defined use cases – most commonly airport links, short urban connectors or demonstration projects. Rather than forming the backbone of public transport, they often function as complementary or isolated elements within wider multimodal frameworks. This discrepancy is indicative of not only differing investment priorities and urban form but also varying degrees of institutional familiarity with the monorail mode.

Market for Monorail	**Number of systems**	**Length in km**			**Number of stations**		
		Total	*of which*		Total	*of which*	
			Airport	Urban		Airport	Urban
Asia							
Japan							
China							
Others							
North America							
USA							

Market for Monorail	Number of systems	Length in km			Number of stations		
		Total	*of which*		Total	*of which*	
			Airport	Urban		Airport	Urban
Others							
Europe							
Africa / Middle East							
South & Central America							
CIS							
Australia & Pacific							
Total							

Current figures underline the extent of this disparity. As of 2024, approximately XX km of monorail infrastructure are in operation globally, of which 87% is used for public transport and 13% for airport connections. The regional distribution is equally pronounced: Asia alone accounts for nearly XX km of the global total. This reflects both the scale of recent investments and the strategic positioning of monorail systems as a complement – not a substitute – to metro and suburban rail development.

Network length of Monorail systems by region and purpose
(km; 2024)



Source: SCI Database

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Figure 2: Network length of Monorail systems by region and purpose (2024)

Asia is by far the largest regional market for monorail infrastructure, representing approximately XX km of the global total. China, Japan, and Thailand lead this market with expansive and rapidly evolving monorail networks.

- **China** operates almost XX km of monorail infrastructure, making it the undisputed global leader. The largest system exists in Chongqing, where two monorail lines – Line 2 and Line 3 – together span nearly 100 km. Line 3 alone, at 66 km, is the longest monorail line in the world. These lines are fully integrated into Chongqing's wider urban rail system, offering transfers to metro lines and playing a central role in managing the city's steep terrain. Wuhu operates two lines with a combined length of approximately 47 km, featuring driverless technology and serving as the city's primary rail-based transit mode. Hancheng is currently constructing a 55 km suspended monorail line – one of the first of its kind in China.
- […]

Distribution of Monorail systems worldwide under construction

Source: SCI Database

© SCI Verkehr

Figure 3: Distribution of Monorail systems worldwide under construction

[…]

The following table highlights a globally diverse pipeline of upcoming monorail projects, underscoring the continued relevance of these technologies across both airport and urban transport applications. Asia remains the most dynamic region, with major investments in Thailand, China, Japan, and Vietnam. Notably, China's Changsha project stands out for its long distance (39.5 km) and high operating speed (160 km/h), pointing to an evolution in monorail applications towards higher-performance interurban links. In contrast, several urban extensions in Thailand and Brazil focus on medium-speed, shorter corridors, reinforcing the mode's role in dense urban environments. Emerging markets such as Egypt, Panama, and the Philippines are also increasingly turning to monorails as a viable solution for capacity expansion and urban connectivity.

The time horizon of these projects varies significantly: while several lines are due for completion by 2025–2026, others, particularly in Vietnam, reflect multi-decade implementation plans. Overall, the data confirms a geographically fragmented yet steadily growing project landscape, with Asia and South and Central America as key drivers.

Market	City	Project title	Distance in km	Max. speed (km/h)	(Expected) completion	Project status
Thailand	Bangkok	Pink Line Extension	3	80	2025	Trial operation
Egypt	Cairo	New Administrative Capital Line + 6th of October Line	96	80	2025	Test phase / Construction
China	Wuhu	Line 2 Extension	14.4	80	2025	Construction
[…]						

2.3 Fleet

The global monorail fleet reflects both the infrastructure footprint and the operational priorities of this highly specialised transport mode. As of 2024, approximately XX monorail cars are in active service worldwide, forming part of XX operational train units. While monorail systems are deployed for various purposes, the overwhelming share of vehicles – around 88% – are used in public transport contexts. Only 12% of the global fleet is associated with airport applications, where they serve as automated connectors between terminals or between terminals and external rail links.

Market for Monorail	Number of systems	Fleet in units			Fleet in cars		
		Total	*of which*		Total	*of which*	
			Airport	Urban		Airport	Urban
Asia							
Japan							
China							
Others							
North America							
USA							
Others							
Europe							
Africa / Middle East							
South & Central America							
CIS							
Australia & Pacific							
Total							

The regional breakdown of fleet volumes, as presented in the accompanying table, clearly underlines Asia's dominant position. With over XX operational monorail cars, the region accounts for more than XX% of global rolling stock. China and Japan alone operate around XX of all monorail vehicles currently in service, followed by emerging monorail fleets in Thailand, India, and Malaysia. In contrast, North America, South America and Europe each operate fewer than XX monorail cars, typically within isolated or legacy systems. The table also highlights differences in system structure: While Asia operates large-scale public networks with fleets often exceeding 100 cars per system, other regions tend to rely on small-scale or single-line operations with more limited capacity.

The fleet composition by purpose is visualised in the adjacent chart. It shows that public transport applications dominate the monorail segment globally, reflecting the mode's growing role in mass transit networks in dense, often topographically challenging urban environments. Elevated alignment, automated operations, and the ability to bypass surface-level congestion make monorails attractive for corridors where traditional metro solutions are not feasible or cost-effective. The limited role of airport monorails is particularly visible outside Asia: Most airport systems in North America are already served by APM or AGT vehicles, and European airport monorails are rare. As the market for new monorail infrastructure continues to grow, especially in Asia and Latin America, rolling stock volumes are expected to increase significantly over the coming decade.

Figure 4: Fleet of Monorail systems by region and purpose (2024)

Asia dominates the global monorail market both in network length and fleet size. Japan and China are the two largest markets, followed by Thailand, India, South Korea, and Malaysia. The majority of systems in this region are straddle-beam monorails with electric propulsion and rubber-tyred running gear. Most fleets are configured for driverless operation and consist of 2- to 6-car trainsets.

- **Japan** operates a fleet of around XX monorail cars across nine systems. The largest fleet is based in Osaka, where the 28 km network is served by over 400 cars, many of which were delivered in the 1990s and early 2000s, with new rolling stock gradually entering service since 2009. Tokyo Monorail, linking Haneda Airport with central Tokyo, operates around 160 cars, while Chiba, Okinawa (Yui Rail), and Tama contribute smaller fleets. Most vehicles are supplied by Hitachi and Mitsubishi and are characterised by robust construction, consistent reliability and modernisation programmes focusing on energy efficiency and automation.
- […]