

Bicycle Sharing

Paris, France; Montreal, Canada; Hangzhou, China

QUICK FACTS

Location
Paris, France

System Name
Vélib'

Number of Bicycles
21,278 (2015)

Number of Stations
1,800 (2015)

Average Daily Ridership
108,117 (2014)

Location
Montreal, Canada

System Name
Bixi

Number of Bicycles
5,200 (2015)

Number of Stations
460 (2015)

Average Daily Ridership
21,000 (2015)

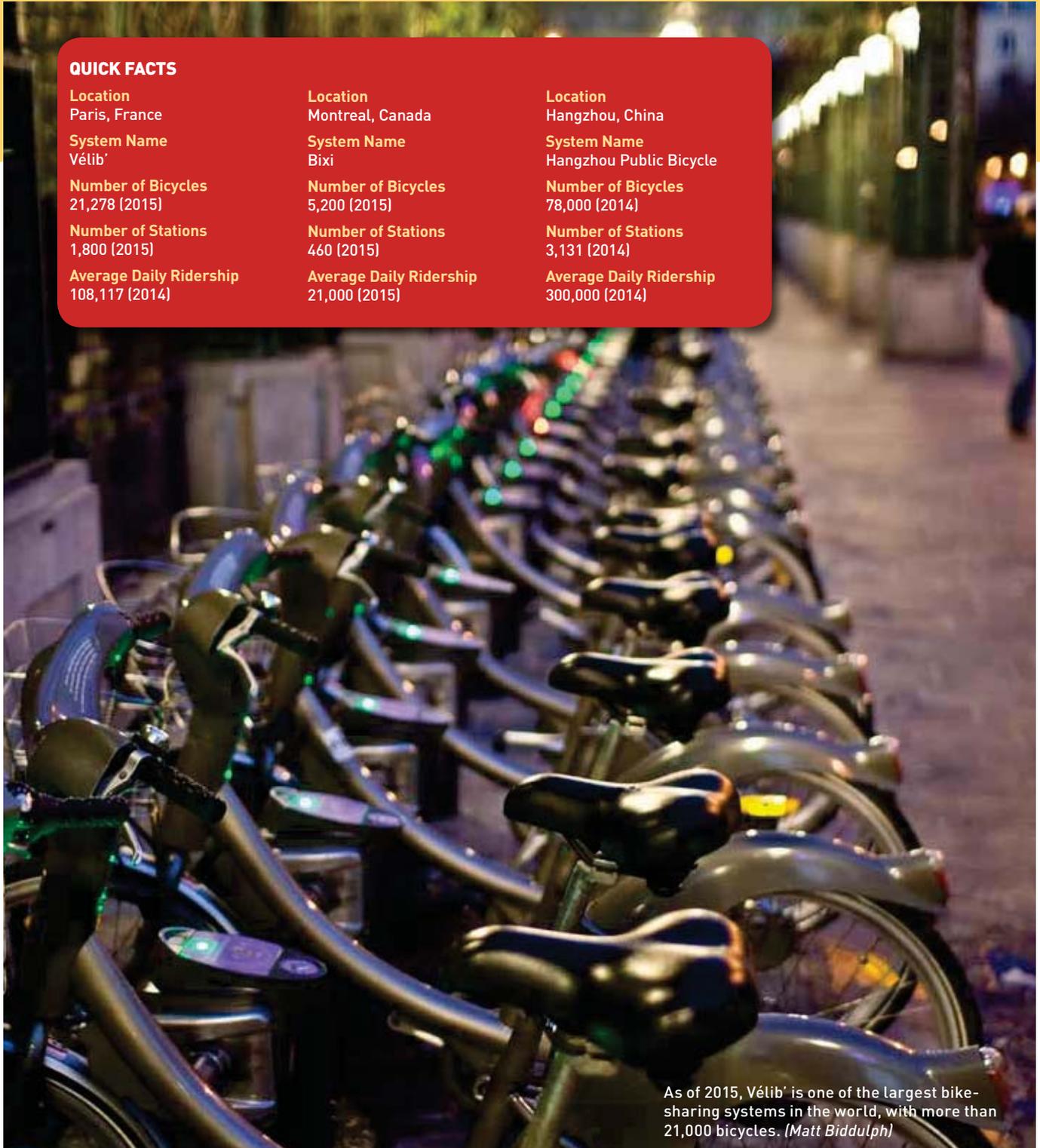
Location
Hangzhou, China

System Name
Hangzhou Public Bicycle

Number of Bicycles
78,000 (2014)

Number of Stations
3,131 (2014)

Average Daily Ridership
300,000 (2014)



As of 2015, Vélib' is one of the largest bike-sharing systems in the world, with more than 21,000 bicycles. (Matt Biddulph)

BICYCLE-SHARING SYSTEMS—services that allow people to rent or borrow bikes for relatively short durations—have become increasingly popular since the early 2000s in cities throughout the world. In 2004, there were just 13 large municipal bike-share systems worldwide. This figure increased to more than 800 as of 2015—with over 200 in China alone.

By providing low-cost rides, bike-share systems allow riders to commute to work, run errands, or access recreational destinations in a healthy way. Many systems fill in gaps in bus and rail transit networks and have also led to positive economic, health, and development outcomes.

The Evolution of Bike Sharing

The concept of bike sharing on a municipal level was introduced in the 1960s when so-called *witte fietsen*—white bikes—were placed around Amsterdam for use by the public. The idea was that anyone would be able to borrow a bicycle, ride it to his or her destination, and then leave it at that location for someone else to use. However, within a few days, the *witte fietsen* were largely stolen or vandalized.

A small number of systems that were variations on the *witte fietsen* concept were attempted over the next 30 years, but most suffered similar issues with theft and maintenance.

The first major innovations to the bike-sharing concept in a large city occurred in 1995, when Copenhagen’s *Bycyklen*, or “City Bikes,” system was launched. City Bikes, which were built to be more durable than standard bicycles, were placed at 110 locations throughout the central city and could be checked out with a coin deposit for unlimited use.

Features of Modern Bike-Sharing Systems

Various innovations on Copenhagen’s City Bikes concept occurred over the next decade, leading to the types of systems frequently seen in the 800-plus cities where bike sharing exists today.

While slight differences exist in the scale and technology used in various bike-sharing systems around the world, most have a few components in common. According to the Institute for Transportation & Development Policy, these features include the following:

>> **Fixed station locations at regular intervals throughout urban areas.** Bike-share stations are generally placed close to areas that generate a significant number of short trips throughout the day, including business districts with large numbers of office workers, areas with a high density of shops

and restaurants, tourist destinations, major parks, large residential developments, and transit stations.

>> **Proximity to active transportation infrastructure.** Stations are frequently located along streets with bike lanes, designated bike routes, and commuter trails.

>> **Automated stations.** While some systems are staffed by attendants, the majority of large municipal and regional systems feature automated bicycle docks. Some larger stations are walled, with access through turnstiles instead of having individual docks.

>> **Information technology payment and station locator systems.** Bike-share users rely on smartphone apps, credit cards, and other information technology services to locate bike-share stations and to pay for bike rentals. Charges often increase the longer bikes are checked out to keep bicycles in circulation and to encourage short-distance trips. Many systems offer free 30-minute rides with membership plans.

>> **Durable bikes with standard designs.** Bicycles are built to be sturdy and require minimal maintenance.

>> **Marketing and branding.** Systems have consistent branding and feature distinctive logos and bike designs to set them apart from other transportation modes. Marketing campaigns inform the public about how systems work and how they are integrated with other modes of transportation.

Development, Quality of Life, and Economic Impacts

Bike-sharing programs have a host of benefits for cities and their residents. According to the National League of Cities, benefits include the following: providing low-cost transit options for users in a cost-effective way, reducing traffic congestion, improving access to jobs, increasing retail exposure and home values, increasing overall levels of physical activity, and decreasing levels of air pollution.



The Vélib' bike-share system in Paris features stations located across the city and surrounding municipalities. (David McSpadden)

Paris Vélib': A Scaled-Up System of Bike Sharing

In 2007, Paris launched the Vélib' bike-sharing program with 7,000 bikes. By 2008, municipal data showed a 70 percent increase in bike riding and a 5 percent reduction in car use. As of 2013, Vélib' had the highest market penetration of any bike-sharing system in the world, with one bike per 97 residents. By 2015, the number of available bikes had more than tripled, with 21,278 bicycles spread across over 1,800 docking stations throughout the city.

Vélib' is financed and run by the French advertising firm JCDecaux. In an agreement with the city of Paris, JCDecaux was given the right to install advertisements in locations throughout the city, keeping associated profits, while the income generated by Vélib' user fees—estimated at €30 million (US\$32.49 million) annually—goes to the city's general budget. Vélib' is the world's longest-running public/private partnership bike-sharing system.

Shortly after Vélib' began service, Bertrand Delanoë, then mayor of Paris, explained his support for the program by noting that "Vélib' is a high-performance service that enables everyone to take advantage of a practical, inexpensive, and ecological means of transport 24 hours a day and seven days a week, providing a new approach to urban mobility."

The scale and success of Vélib' inspired the creation of bike-share systems throughout the world.

Montreal Bixi: Bike Sharing and Increased Property Values

The city of Montreal started a municipally run bike-share system in 2009, called Bixi. It was modeled after Paris's Vélib' and was the first bike-sharing system in North America. By 2015, the Bixi system included 5,200 bikes across 460 stations.

While the system has experienced financial difficulties, including declaring bankruptcy in 2014, it remains popular with Montreal residents and accommodated 3.5 million rides in 2015, an increase of 9.4 percent from the previous year.

Canadian businessman Bruno Rodi, who financed a bailout of the system in 2014, explains the importance of the system to Montreal, saying, "Bixi is part of the signature of Montreal. It symbolizes an active city, a clean city, modern, and focused on sustainable development." Today, Bixi is run by the nonprofit organization Bixi Montreal, with funding from user fees and the city of Montreal.

Bixi has had positive economic impacts for Montreal. According to a McGill University study, neighborhoods with 12 stations within a half-mile (800 m) area saw increased property values for multifamily housing units of 2.7 percent.

The study looked at Montreal housing units that were sold multiple times between 1996 and 2012 and found that each single Bixi station within a half-mile (800 m) area increased a unit's value by CA\$709 (US\$502). Homes in Bixi's coverage area were found to have an average of 12.2 stations within a half-mile (800 m), leading to a CA\$8,650 (US\$6,123) increase in their values.

With 5,200 bikes across 460 stations as of 2015, Montreal's Bixi bike-share program was the first in North America. (pdinnen)



Hangzhou, China: Bicycle Sharing on a Grand Scale

Hangzhou, China's bike-sharing system, Hangzhou Public Bicycle, debuted in 2008 and was the first bike-share program in Mainland China that operated with an information technology-based system. As of 2015, Hangzhou Public Bicycle had 78,000 bikes and 3,131 stations, making it second only to Wuhan, China, in its scope. Funding comes from advertising revenue, user fees, and government subsidies.

Hangzhou's bike-sharing system allows riders to use payment cards for bicycle rentals that can also be used for public transit and taxi services. Bike-share stations are integrated with public transportation routes, with many stations accommodating up to 140 bikes. By 2011, more than 30 percent of Hangzhou commuters used bike sharing as part of their commute.

Due to rapid economic development and significant population growth, Hangzhou—a city with a population of nearly 8.5 million in 2010—is continuing to invest in bike sharing to improve urban mobility. The city has plans to increase the number of bikes in its system to 175,000 by 2020.



As of 2015, the Hangzhou Public Bicycle system had 78,000 bikes and 3,131 stations. (Payton Chung)

Bike sharing has been shown to produce positive impacts for the retail sector. A University of California, Berkeley, study found that four out of ten people in Toronto and Montreal shopped more at locations near bike-share stations, while Washington, D.C.'s Capital Bikeshare program found that 82 percent of people were "somewhat more likely" or "much more likely" to patronize a business, restaurant, or shop if it was accessible through a bike-share program.

In a number of instances, cities are working with private businesses and real estate developers to share both the costs and benefits of bike sharing, including in London, where developers of a mixed-use project called 250 City Road are working with the municipal government to finance the creation of a new "Santander Cycles" station on their property (see project profile).

Bike sharing can also contribute to public health. A study by Spain's Centre for Research in Environmental Epidemiology found that Barcelona's bike-share system contributes to reducing yearly CO₂ emissions by an estimated 9,900 tons (9,000 metric tons) and leads to the equivalent of 12 lives saved each year due to increased physical activity, even when controlling for risks of collisions and air pollution.

The benefits of bike sharing for cities and their residents have spurred continuing increases in the number and size of systems. By enhancing the ease of access to active transportation opportunities, bike sharing is shaping transportation planning and real estate development decisions around the world.