

# sustainable transport

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**Paris** bike sharing  
**Rio de Janeiro** downtown revival  
**New York** congestion pricing



**ITDP** *Institute for Transportation  
& Development Policy*

# Bike Sharing Sweeps Paris Off Its Feet

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Parisians are known for favoring revolutions over peaceful reform.

On the morning after Bastille Day 2007, Paris awoke to thousands of new gleaming, pearl grey bicycles stationed at former parking spaces all over the city. Within hours of the system's opening, the streets were filled with "freedom bicycles." Vélib, the new bicycle-based mass transit system, proved that the revolution will be non-motorized.

By the 18th day, Vélib had logged one million rides. The ubiquitous bikes are now an integral part of the city's identity, a symbol of Mayor Bertrand Delanoë and Deputy-Mayor for Transportation Denis Baupin's multifaceted efforts to address traffic congestion, reduce air and sound pollution, and revitalize the city's public space.

The Vélib revolution began with doubling the amount of cycleways in the City, making a fairly coherent and continuous network. In early 2001, bicycling represented about one percent of the 10.6 million trips made daily. Between 2001 and 2006, bicycle mode share increased by 48 percent while keeping the number of crashes and injuries stable. Vélib is expected to double or triple the number of daily bicycle trips and to accelerate the rate of independent bicycling.

A few months ahead of the municipal elections, Vélib is indeed "a success beyond our expectations" said Pascal Cherki, Deputy Mayor for Sports.

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*Buses and bicycles, including Velib's,  
share the same segregated lane.*





*Velib parking stands have numbers on them so you know which bike to take once you pay for your subscription.*

## How Vélib Works

Vélib is an important innovation over earlier city bike sharing programs. Amsterdam famously put free bicycles on the street in the 1960s, but they were not well maintained and eventually all were stolen. Starting in the late 1990s, both JC Decaux and Clear Channel improved on this model, with successful automated and credit card based programs in Rennes, Amsterdam, Vienna, Lyons, Oslo, Brussels, Stockholm, Helsinki, and Barcelona. The Vélib program in Paris is however by far the largest and the most successful. When it comes to bike sharing programs, size (and density) matters.

Vélib requires the user to pick up and leave the bike at automated, self-service bike stations. Users can either have an annual membership or pay for short term subscriptions for daily or weekly usage. A one-day subscription costs 1 euro, a weekly subscription costs 5 euros and an annual membership costs 29 euros.

Terminals at each station allow the purchase of a short term subscription with a credit card, which gives you a subscriber number and a password. Getting the bicycle then only requires typing the number into the terminal any time during your subscription period, selecting a bike stand number, and stepping to the stand to unlock the bike. Annual members use their smart card and just swipe it at the parking stand instead of going to the terminal.

In addition to paying the subscription fee, short term users must pay a security deposit of 150 euros, which is pre-authorized on their credit card to help guarantee the return of the bikes. This cuts back dramatically on theft.

### Usage Costs

Time Period	Increment	Total
First 30 minutes	Free	EUR 0
Second 30 minutes	EUR 1	EUR 1
Third 30 minutes (1 - 1.5 hours)	EUR 2	EUR 3
Every half hour increment afterwards	EUR 4	EUR 7+

Beyond this, for the first 30 minutes, the bicycle is free to use. However, after that, usage costs are incurred (see table). This system, including the pricing system, is designed for short range, individual trips. As a result, in the first two months of operation, 92 percent of the trips lasted less than 30 minutes.

The bike comes with its own lock for intermediate stops, but when the user is finished, the bike has to be returned to one of the Vélib stations. Because of this, there needs to be enough stations that riders can readily find one. Vélib opened in July with 10,648 bicycles and 750 stations; by December of 2007, the system will have 20,600 bicycles and 1,451 stations – or one every 300 meters in central Paris.

If a station has no empty stand, 15 minutes of free time can be added in order to reach the next station by swiping

# Paris | Bike Sharing



*Left: Freedom bicycles are parked at stations in individual parking stands. Right: Soon after opening, Vélib bikes filled the expanded network of cycleways. The bicycles were specifically designed to integrate into the environment and meet commuter needs while withstanding the rugged operating conditions.*



the smartcard or logging into the terminal. The terminal also shows the status of nearby stations and their current number of empty slots.

Vélib stations tend to be located on converted parking spaces. About 15 to 25 meters long, each station displaces three to five parking spaces – or roughly 6,000 parking spaces total by the time of full implementation.

Although the system was planned with about 70 percent more parking stands than bikes in operation, the even distribution of bikes and open stands at stations remains the main challenge of the system. Optimizing station sizes and locations presents an interesting challenge to system planners. In Paris, the plan was done by the Atelier Parisien d'Urbanisme (APUR). Many stations are near historical landmarks and required approvals from the Department of Architecture and Heritage. Because it was difficult to predict where pick-ups and drop-offs would concentrate, the system operator has staff with 20 compressed natural gas (CNG) vehicles dedicated to shifting bikes from full to empty stations.

Vélib also has a support center on a barge that moves between 12 landing points on the river. It features a shop with 10 mechanics and ships the more seriously damaged bikes daily to the main logistical base outside the city.

## Vélib Bikes

Particular attention was given to a bike design that would blend elegantly in the Paris landscape. At 22 kilos (compared to about 18 kilos for a standard commercial bike), the three-speed bike is not designed for speed, but to be substantial, sturdy, and to handle some 18,000 kilometers in a year. Particular attention was given to prevent taking on passengers. Thus, there is no back rack, no horizontal frame bar, and no child seat option.

The shifting, dynamo and brake systems are all located inside wheel hubs. Control chips inside the bikes report on their condition, as well as on tire pressure and on the bright LED lights, directly to the central computer via the docking stand. If a bike is defective, it remains automatically locked on its stand (a red light appears) until the mechanic clears it. Bikes returned to the stand for less than a minute stay locked for inspection as well.

Weight, along with the distinctive design, was also thought to discourage theft. However, this has been only partially successful. As of September 10th, 250 to 300 bikes had been stolen. "This is a lot" said a JC Decaux official. Some of the bikes have been removed from the stations by sawing through the arm that locks the bike to the rack. In most cases, thieves simply took bikes improperly locked at the stand by their users.

## The Contract: The City and JC Decaux

Vélib is privately operated by SOMUPI, a joint venture owned by JC Decaux, an outdoor advertising and street-furniture multinational, and Publicis, a large advertising and communications corporation. Most profits are derived from billboard advertising.

SOMUPI is responsible for covering the entire cost of implementing and managing Vélib, as well as any additional fees. In return, it receives exclusive rights to provide and operate the bus shelters, public announcement boards, and other street furniture, which then serve as the physical support for 1,628 lucrative advertising boards. The revenue directly generated by Vélib subscription and rental fees, expected to be in excess of 30 million euros a year, goes to the city. If SOMUPI meets all contractual standards of good operation of the system, it is entitled to revenue sharing of

12 percent of Vélib revenues plus payment by the city of an amount equal to 12 percent of advertisement sales, i.e. about 10 million euros.

Since 1976, SOMUPI had held the street furniture and billboards contract with the city. The contract was not supposed to expire until 2010. However, in January 2006, Mayor Delanoë decided to break it and tender a new one designed to emulate the success of Velo'v, Lyon's bike share program, also run by JC Decaux. Delanoë wanted at least 3,000 bikes by the summer of 2007, and 6,000 by the end of the year. He also demanded a 20 percent reduction in the 2,000 existing billboards.

The top two bidding companies were SOMUPI and Group for Paris, a joint venture led by Clear Channel, the Texas-based global media conglomerate and number one outdoor advertising company worldwide, and including major French companies. Initially, Group for Paris made the winning bid in November 2006 with a proposal for 14,000 bikes; SOMUPI's proposal was for just 7,500. However, SOMUPI attacked the bidding process on technicalities and obtained its cancellation at the Paris Administrative Court. In February 2007, SOMUPI won the new bid by tripling its initial offer to 20,600 bikes and pledging to implement the first phase by summer 2007. Group for Paris's bid remained 14,000 bikes, and offered a slower timetable.

No precise numbers regarding Vélib implementation and operational costs have been published, but various public statements by Decaux officials suggest that capital investment and bike procurement amount to about 90 million euros. Maintenance costs in Lyon's similar bike-share program are reportedly about 1,000 euros per bike per year.

On this basis, the total investment and operational cost of Vélib over the 10-year contract is estimated to be about 300 million euros. Decaux separately said that he expected the 1,628 billboards to earn 60 million euros per year for SOMUPI -- or about 600 million euros total. The consortium also has to pay for the billboards, street furniture, and up to 32 million in space rental fees to the city.

Critics have raised the question of whether JC Decaux's back-lit billboards consume as much fossil energy as is saved by people using Vélib over motorized forms of transport. The billboards, however, pre-existed. While many of them are being retrofitted with rolling ads mechanisms, the increased energy consumption may be relatively marginal. A more important question is whether the city should have paid for Vélib directly out of its budget. It could then have either

auctioned the advertising contract separately at a higher price or simply cancelled it as an undesirable encroachment on the public realm.

Local governments clearly like deals that make urban amenities appear to have no cost to the tax-payers, a business concept JC Decaux pioneered in the 1960s. In the case of Vélib, the bidding process was so competitive that in the end the city got a much better contract than it initially thought. Also, with JC Decaux's experience, SOMUPI was able to implement Vélib on schedule and with only minimal glitches.

At about the same time, Barcelona has shown that different financing schemes are possible. The city pays 4.5 million euros per year for the 3,000 bike-share program managed by Clear Channel. The separate urban furniture and advertising contract, operated by JC Decaux returns 11 to 18 million euros per year.

## Behind Vélib: The Paris Mobility Plan

Vélib is just one component of Paris's new mobility plan. When the Delanoë Administration came into office in 2001, they took a sharp turn away from previous administrations. They understood that new road construction just led to more car trips, further degrading the urban environment. They set out to scale back motorized traffic, focusing instead on revitalizing local life and public spaces, by converting acres of roadway and parking spaces into pedestrian space, bike lanes, busways and tramways.

In the summer of 2002, the Quartier Verts (Green Neighborhoods) program was the first initiative to reclaim neighborhood streets for the community. Squares and plazas were renovated, sidewalks widened, and new landscaping and



*New pedestrian spaces and traffic-calmed streets have renewed street life. Wide sidewalks give more space for pedestrians, outdoor cafes, and bike parking.*

raised crosswalks were added. To slow traffic, street directions were revised to carefully eliminate all through-routes, making vehicles exit back onto the avenue from which they entered. The legal speed limit was lowered to 30 km/h from 50 km/h. On most of these slow speed, one-way streets, cyclists are allowed to use the road in both directions.

# Paris | Bike Sharing

A network of pedestrian-priority shared streets was also created, where the legal traffic speed was lowered to 15 km/h. New low-floor microbus circulators were introduced to improve local accessibility and connections to transit stations. Free parking was eliminated altogether. Although parking permits are issued to residents for a nominal fee, they are only valid for parking spaces in the immediate vicinity.

The Espaces Civilisés program was launched to tame the heavy traffic that dominated many of the wider boulevards and avenues. Boulevard de Magenta was one of the first to become a “civilized space.” Dubbed by residents as the Magenta expressway, it had endured traffic volumes up to 1,400 vehicles per hour in each direction, frequent speeding, and many fatalities at intersections. Noise and pollution levels were among the highest in the city.

Under the program, 24 million euros were invested (about 260 euros per square meter) into widening sidewalks from 4 to 8 meters, planting trees, and building bikeways. Granite separators were put in to protect a new dedicated bus lane. To accommodate deliveries, 30 minute truck parking spaces were placed on the curb-side of the bus lane. Intersections were made safer with secured crosswalks, widened median refuge islands and extended crossing phases for pedestrians. New pavement, landscaping, and street furniture were added to sidewalks and plazas. Businesses signed “charters of quality,” harmonizing displays and signs and promoting good public space practices.



Paris has opened three BRT lines, as part of a 17-line plan.

While Paris regularly expands its Metro and recently opened a new tram line, the administration is also building a light BRT system, with 17 major lines in the City of Paris, and 150 lines in the metropolitan area. The Mobilien system has dedicated bus corridors, signal priority at intersections,

and raised stations for rapid boarding and alighting from any door of the low-floor buses. Fare payment is mostly done by Navigo smart cards and enforced by roaming ticket inspectors. The first three BRT lines opened between 2005 and 2006. Though bus ridership was disrupted during construc-



Microbuses now link traffic-calmed neighborhood streets to higher volume bus and metro stations.

tion, by the second half of 2006, ridership on new Mobilien busways increased dramatically.

The city is also developing a new car sharing program, with self service pick up stations similar to the Vélib system. The city will be supplying three recently licensed car sharing companies with parking spots in public garages and at on-street stations. One car-sharing vehicle is estimated to substitute 10 personal cars, and experience shows that users tend to reduce their mileage by about 20 percent due to pricing incentives.

These improvements and traffic restraint measures led to a decrease in private vehicle traffic by 20 percent, trucks by 11 percent, and tourist buses by 11 percent between 2001 and 2006. The Metro received the biggest ridership increase, at 12 percent. With the completion of the first Mobilien corridors, bus ridership is also now growing rapidly.

Over the same period, all indicators of air pollution improved regularly, with the exception of summer ozone levels. Six percent of the overall 32 percent reduction in nitrogen oxides (NOx), as well as all 9 percent of the reduction in carbon dioxide (CO2) emissions, were attributed to the reduced number of cars and trucks in the city. Air quality had strongly improved along the streets and avenues that have been reorganized, with a reduction of 10 micrograms of NOx per cubic meter on many streets. Injuries also decreased

by 25 percent between 2001 and 2005, in spite of a rapid increase of motorized two-wheelers. Motorcyclists constitute 50 percent of road casualties in the city.

## The Future

Mayor Delanoë is running for reelection in March 2008, as is his Green Party coalition partner, the Deputy-Mayor Baupin. They are opponents in the first round of the election, and both are claiming credit for the legacy of their mobility achievements. However, if they are re-elected, it is probable that they will join in coalition again. Although Baupin has occasionally been called names such as 'Pol Pot' and the 'Khmer Vert' by disgruntled motorists, this critique

has largely fallen flat given the increasing interest in environmental and climate change issues in opinion polls.

The administration has only been charging ahead. In February 2007, it presented a 15-year sustainable Mobility Plan which the Council of Paris approved for public hearings and a final vote in 2008. The 2020 objectives of the plan include: reducing traffic by 40 percent; reducing greenhouse gas emissions by 60 percent; increasing transit capacity by 30 percent; and raising non-automobile transportation mode share from 78 percent to 83 percent.

The city has become a role model for sustainable transport. Should the next administration receive a renewed mandate to continue these policies, Paris would be able to sustain their revolutionary efforts. 🌱

## 2008 Sustainable Transport Award Winner: London



This year, London expanded on the success of its groundbreaking 2003 congestion charging plan with a doubling of the congestion zone, increased fees for motor vehicles, and new city-wide emission-based tolls that are spurring more rapid adoption of cleaner, fuel efficient vehicles. Prior to the charge, London drivers spent

50 percent of their time in traffic jams, costing the city between £2-4 million every week.

Inspiring cities both in the United Kingdom and abroad, London is the largest city to undertake such a measure. A £8 flat fee is charged when a vehicle enters the congestion charge zone between 7am and 6pm with a stiff penalty (up to £250) for non-payment. Drivers have until the next day to pay. Payment methods include on-line, by a text message, by phone, or at pay points located in the zone.

Cameras at every entry point record license plate numbers with a 90 percent accuracy. These plate numbers are verified against the list of payees. If a plate number is not on that list, then the national Driver and Vehicle Licensing Agency's database is used to find the owner of that plate to issue a fine.

Traffic congestion in the western extension zone dropped 25 percent this year. Some 70,000 fewer vehicles

enter the extended congestion charging zone on a daily basis. Within the congestion charging zone, there was an 8 percent reduction in NOx, a 7 percent reduction in PM10, and a 16 percent reduction in road traffic CO2 emissions.

Overall, the congestion charge has increased bus patronage by 32 percent. Bike use has increased by 43 percent. Each year over £123 million are raised for public transport improvements. The gross revenue from congestion charging is about £213 million, of which £90 million cover the operating costs.



*Congestion charging took traffic off the streets, making it possible to convert traffic lanes to bicycle lanes.*

London also introduced a Low Emission Zone (LEZ) in May of 2007. The most polluting diesel-engine trucks, buses, coaches and large vans must meet specified Euro targets or pay a fine. The zone will expand to include all of London by 2008.

London also created a long range plan for 2025, which introduced innovative performance targets. Government performance will be evaluated based on progress towards the following targets: a nine percent mode shift from car to public transport, walking, and cycling, CO2 emissions reductions of 22 percent and a nine percent reduction in travel time from the 10 percent most deprived areas in London to town centers and the central business district.

Because of these groundbreaking initiatives, the Steering Committee of the Sustainable Transport Award recognizes London, as well as Paris, as the winners of the 2008 Sustainable Transport Award. 🌱