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The Bicycle System



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Origin

During the 1990s, in developed countries, local authorities realized that creating cycling facilities alone was not enough to revive the practice of cycling. Many other factors were essential for supporting cyclists, securing their travel, encouraging the practice, and fostering their skills..

Components

The bicycle system is composed of:

- a continuous, connected, uniformly safe cycle network (CERTU, 2000, CROW, 2017) that aims to cover the entire road network, with facilities (tracks, lanes or shared bus cycle lanes^[1]) on roads limited to 50 km/h, reduced traffic areas (30 km/h zones, home zones and pedestrian zones) on all roads where local life dominates, contraflow bicycle lanes on one-way streets and overpasses or underpasses for crossing barriers in the urban landscape (large roads, railways, waterways, etc.);
- reliable bicycles with the necessary equipment at affordable prices to make frequent, comfortable and safe use possible;
- services such as parking facilities at home and at the destination (stations, workplaces, shopping areas, etc.), repair shops in every neighborhood, bicycle rental services (from half an hour to annual rentals), road signage, network maps, digital applications;

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 Although the reference is rarely explicit, the concept of bicycle system was actually modeled on that of the automobile system. In 1988, town planner Peter Hall explained that car use requires not only a high-quality, extensive road network, but also mass production and mass consumption of cheap vehicles, sufficiently well-respected road rules, traffic information, international traffic rules, and a variety of services such as petrol stations, motels, fast food, shopping centers with large car

<div class="logo logo-mobile"> [4]</sup> 2) well-trained users 3) a continuous, connected, safe network and 4) a regulated, friendly environment.

In urban areas, the bicycle system, along with walking, public transportation and carpooling, can offer an "environmentally-friendly transportation system"^[5] capable of competing with the automobile system. Bike & ride is often faster than car travel.

The rise of the bicycle system

In order for a bicycle system to develop, all the components of the system need to progress simultaneously in order to avoid bottlenecks. For example, it is pointless to increase cycling amenities if cyclists cannot park their bicycles safely (or vice versa). Similarly, creating a large bikesharing services while the cycle network is still in its infancy makes little sense. It is likewise useless to encourage people to cycle if vast efforts are being made to prioritise car traffic. The authorities are becoming aware of these discrepancies and are trying to rectify the problems.

Four virtuous circles can therefore be activated within the four components of any modal system. 1) A park effect: the more bicycles there are available, the more the supply expands and diversifies to meet different tastes and needs (electrically assisted cycles, carrier cycles, cargobike, delivery tricycle, etc.), equipment (brake hubs, powerful lighting systems, puncture-proof tires, audible bells, comfortable saddles, etc.) and accessories (ponchos, gloves, helmets, bags, trailers, etc.). 2) A club effect: the more the cycling community grows, the more its members can help each other, and the more it increases its influence and imposes cycling as a new standard of behavior. 3) A network effect: the denser and more connected the network, the more attractive and efficient it becomes by making cycling more relevant (these three effects are inspired by Dupuy, 1999, chapter 3). 4) A safety in numbers effect: the more cyclists there are, the safer they are (Jacobsen, 2003), as they become more visible to other users, calm traffic by their slow speed, enjoy more amenities, and are often themselves drivers who become more aware of the presence of cyclists (Johnson, 2014).

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Figure 1. Change in bicycle use in Paris, Lyon, Bordeaux, Brussels, London and Geneva, from 2001 to 2017 (index 100 in 2001)[^6]

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Figure 2. Change in bicycle use in major U.S. cities, from 2005 to 2014, based on home-work commuting counts (rolling averages over three years)[^7]

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 The bicycle system can also collapse when motor vehicle traffic and speeds increase rapidly, which threaten cyclists directly. In the developed countries of Western Europe during the years of post-war growth, the motorization rate increased by about 10% per year. The four circles identified above began turning in the other direction, which explains the veritable collapse of cycling at that time, with a six-fold decline in countries that motorized the earliest (e.g. the United Kingdom and France) (Figure 3) over a period of 25 years. It then fell threefold in countries that motorized later, such as the Netherlands (Figure 4). The collapse was only halted by the energy crisis in 1974, and later by the traffic calming policies initiated in some countries, under pressure of populations overwhelmed by the nuisances linked to the automobile. Hence, the cycling modal share varied greatly according to the country in the early 2000s (Figures 5) (Héran, 2014).

Figure 3. Change in the number of cycling trips in the United Kingdom (in billions of passenger-kilometers)[^8]

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Figure 5. Cycling modal share in European countries in the early 2000s (in %)[^10]

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The role of bikesharing systems

In Western countries, bikesharing services were in no way responsible for the revival of cycling. However, they have helped accelerate the renaissance that began several years ago. Data from cities where such a system is developed enough to influence practices (Lyon, Paris, London, Brussels, New York, Barcelona, etc.) clearly show this. More specifically, people are getting back on their bicycles first and foremost thanks to traffic calming policies in city centers. When bikesharing systems appear on the scene, they benefit from the windfall effect of a price that is three to seven times less (depending on the cost of the subscription) than owning a bicycle. But in the long term, the trend has hardly changed and is identical to that of cities without bikesharing (e.g. Grenoble and Ghent) or with a small bikesharing system (e.g. Strasbourg).

Public bicycles cannot replace a cyclable city policy, as they only help cyclists to get around the problems they encounter and do not solve them directly. Because of their high cost to the community (about 3,000€ per year per cycle) and the room they require in the public space (bicycles are spaced far apart, and stands must also have empty spaces), their potential is limited. Communities quickly run up against the classic economic problem of optimal allocation of scarce resources. If they are unable to find new funders, they generally reduce their bikesharing services to specific uses (notably tourism) and reallocate their budgets to dealing with the problems encountered by cyclists at their source: the purchase of quality bicycles, parking at

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 Participative and solidarity workshops make up for a lack of bicycle sellers and repairers in neighborhoods and have spread across Europe in the past 10 years at a robust pace of 20 to 40% per year^[15]. Cycling schools, which are also booming, teach adults to ride and increase their autonomy^[16]. The media is finally becoming more receptive to various cycling cultures.

All of these developments, which can be observed in every developed country, should ultimately allow city dwellers to do most of their home-work commutes by bike^[17] using a hundred times less energy and materials than by car. Combined with fast, frequent, direct public transportation, an optimized bicycle system could be a realistic solution to the current challenges of everyday mobility.

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[^1]: Cycle tracks are separated from motor vehicle traffic by a physical barrier or, at the very least, a continuous white line. Bike lanes are separated only by a broken white line. Bus-bike lanes are bus lanes that are open to cyclists. [^2]: Cyclists may ignore red lights when making certain maneuvers, giving way to other road users. [^3]: Changing rooms and showers can be useful but are not essential, as cycling in the city does not require specific athletic physical abilities. [^4]: This is usually a vehicle, except for walking, for which merely a pair of shoes is necessary. [^5]: Translation of the German *Verkehrsmittel des Umweltverbundes*, a concept introduced in the 1980s (Monnheim and Monnheim-Dandorfer, 1990). [^6]: Sources. For Brussels: Pro Vélo, *Comptages et analyse des données. 2017 Report*, Observatoire du vélo en Région de Bruxelles-Capitale, 2017, 22 p. For Lyon: Mathieu Meylan, Greater Lyon, Powerpoint document, Road services, urban mobility, 2017. For London: data available on the London City Hall website: <https://data.london.gov.uk/dataset/cycle-flows-tfl-road-network> and processed by us. For Bordeaux: Bicycle observatory for Greater Bordeaux. For Paris: *Le bilan des déplacements en 2016 à Paris* and those of previous years. For Geneva: City of Geneva, *Les comptages vélos 2015. Rapport technique*, Directorate-General for Mobility, 2016, 64 p. [^7]: Graph source: New York City Department of

Transportation, *Cycling in the City. Cycling Trends in NYC*, NYC-DOT, New York, 2016, p. 10. [^8]: Source: Department for Transport, National travel survey, 2017. No such statistics exist in France, but the situation in France is quite similar. [^9]: Source: Otto VAN BOGGELEN (dir.), *De invloed van het weer op het fietsgebruik en het aantal fietsslachtoffers*, Fietsberaad, Rotterdam, 2007, p. 25 and 28. [^10]: Source: European Commission, *EU Energy and Transport in Figures*, Statistical Pocketbook, 2000 et 2002. This first comparative exercise has not been repeated. [^11]: It is forbidden to park a vehicle on the sidewalk. Annoyed pedestrians dismiss these bicycles as unsightly wrecks. [^12]: Voir <https://www.alternatives-economiques.fr/velos-responsables-velos-predateurs/00083550> [^13]: In France, purchase premiums for electric-assisted bicycles, introduced in February 2017 and greatly reduced a year later, helped double sales during that year. [^14]: Cycle with no freewheel. [^15]: Mi 2017, the federation of bicycle workshops, L'Heureux cyclage, had 50,000 members in 270 workshops in France. [^16]: All over Europe and in France in particular. We counted about 100 in the FUB network (French federation of bicycle users) and many others in cycling schools like the MCF (French cycling instructors), FFCT (French Federation cycle tourism), UFOLEP (the French Union of Secular Physical Education) and the *Petits Débrouillards* (Little "Do-it-yourselfers") as well as community centers. [^17]: In France, the average distance is 14.8 km, according to the 2008 national transportations and travel survey.

Mots clés

bike

bicycle

sustainable mobility

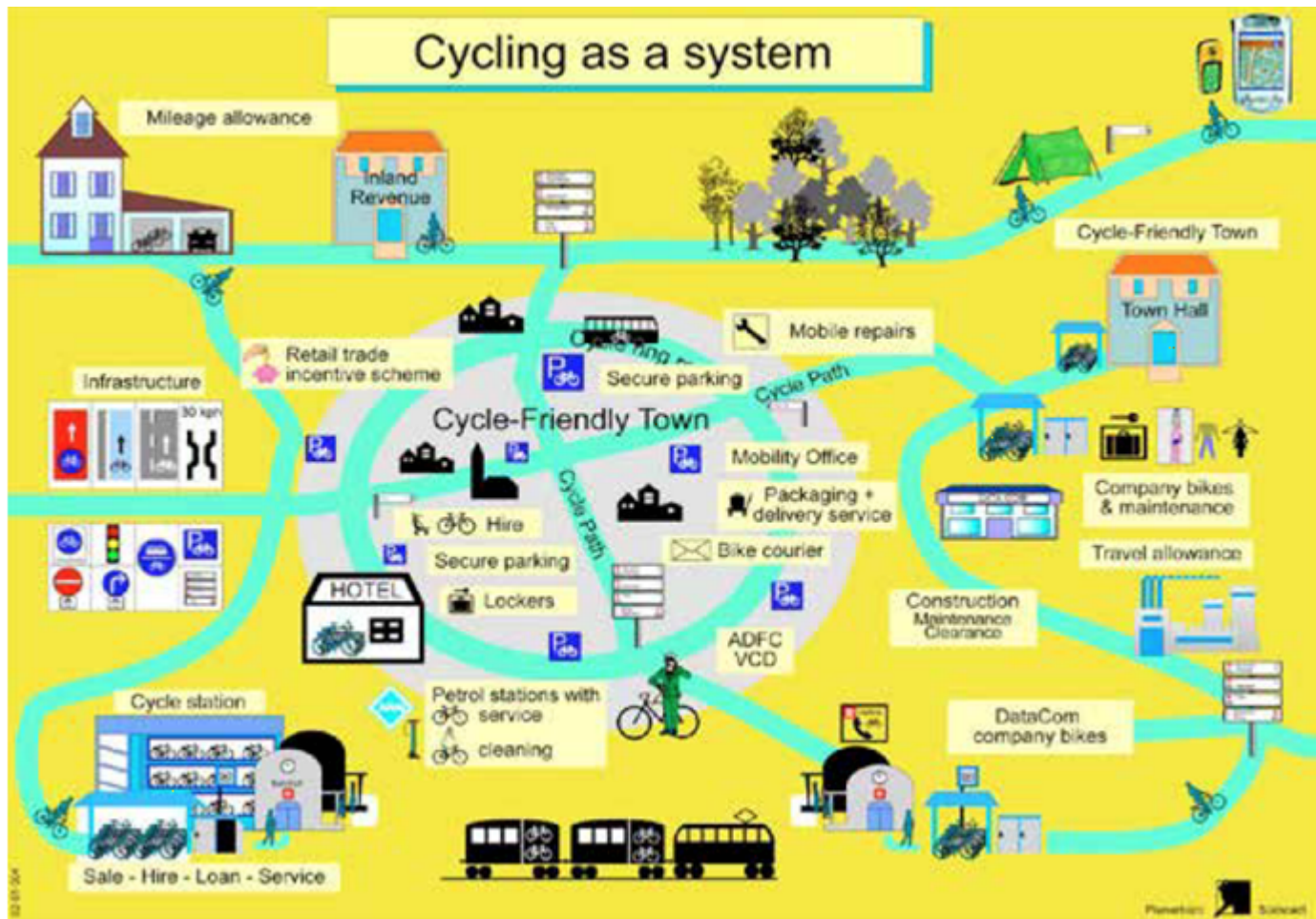
Discipline

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Activer

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Ajouter le trianglesi ce contenu est affiché dans la quinzaine

Désactivé

Auteur lié

Frédéric Héran (Transport economist and urban planner)

Thématique

Alternative mobilities

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