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Conference Paper

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51st Congress of the European Regional Science Association: "New Challenges for European Regions and Urban Areas in a Globalised World", 30 August - 3 September 2011, Barcelona, Spain

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Andrade, Katia; Kagaya, Seiichi (2011) : Cycling in Japan and Great Britain: A Preliminary Discussion, 51st Congress of the European Regional Science Association: "New Challenges for European Regions and Urban Areas in a Globalised World", 30 August - 3 September 2011, Barcelona, Spain, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/120175>

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Cycling in Japan and Great Britain: A Preliminary Discussion

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1. Abstract

Around the world, cycling has mostly been used for two main purposes. Some societies view and utilize the bicycle as an integral part of the transportation system. Even if not used as the main transportation mode, it can still be used efficiently as a complementary transportation mode to public transit modes. The Netherlands and Denmark are examples of European countries where cycling accounts for high daily shares. Among Asian countries, Japan and China present significant cycling rates. However, as the contemporary societies grow more auto-dependent, cycling has been merely seen as a means of recreation and rarely used for daily travel in many other countries. Examples are the United States, Australia and Great Britain where nationwide statistics suggest insignificant bicycle shares.

As part of a larger research project, this paper presents a preliminary discussion on the use of bicycle in two countries with significantly different cycling characteristics, Great Britain and Japan. In most British cities, cycling is not an integral part of the transportation system, despite considerable efforts from government. Conversely, cycling is a widely accepted transportation mode throughout Japan, even though Japanese cities do not yet present extensive cycling networks. Traditionally, Japanese urban plans are limited to two main actions with regards to cycling; either implementing bicycle parking facilities around railway/subway stations, or establishing bicycle zones within road intersections. The main objective of this paper is to present an overview of each country's cycling system, with a focus on travel patterns and bicycle facilities. Initially, benefits from cycling are pointed out. Cycling trends are then compared, whilst bicycle infrastructure and service are summarized. The paper concludes by comparing transport policies and strategies towards cycling in these countries and discussing the relative merits of each approach.

2. Benefits from Cycling

The increasing awareness of problems encountered within contemporary urban societies has led to an interest in promoting the bicycle, as numerous benefits are accounted to its use. Cycling is addressed as one of the most sustainable and efficient transportation modes for short to medium distance trips [Whitt and Wilson, 1982; Exploratorium, 2007]. The only energy required for cycling is provided by the traveler, who is directly benefited by the cycling activity [Pucher and Dijkstra, 2003]. Arguably, physical and mental health standards improve by adopting cycling as a regular transportation mode [Toor and Spenser, 2004]. A few diseases, such as obesity and respiratory disturbs, are found to be correlated to auto-dependency [ALA, 2006]. These diseases can be addressed by using healthier transportation modes, such as the bicycle [ALA, 2010]. Moreover, a correlation has been found between frequent cycling and reduced levels of psychological problems, such as stress and depression [Burden, 2001; Morris, 2004].

In addition to individual benefits, cycling offers several society wide benefits. For example, it consumes considerably less nonrenewable natural resources than motorized transport modes [Morris, 2004]. Also, it does not emit any critical air pollutant [U.S. Environmental Protection Agency, 2006]. Noise pollution levels, particularly in central urban areas, can be significantly reduced by increasing bicycle travel in place of automobile travel [Shahan, 2007]. Furthermore, increasing the share of non-motorized modes is a potential factor in alleviating common automobile-related problems, such as traffic congestion and urban sprawls [Stinson and Bhat, 2003]. One more benefit from increasing the bicycle share is that cycling requires much less space than that required by private cars. Moreover, cycling is highly economical in comparison with other modes, both in direct user costs and indirect infrastructure costs [Pucher and Buehler, 2007]. Accordingly, making bicycle an effective transportation mode would also motivate social inclusion, particularly in developing nations. These benefits place bicycle as a potential agent to achieve more sustainable and inclusive societies.

3. Divergent Cycling Trends

In a few countries, the bicycle has left the position of a recreational equipment to become an important transportation mode. China is a significant example with some Chinese cities registering the highest cycling rates in the world. For example, in Tianjin, Xi'an and Shijiazhuang, the bicycle accounts for more than half of all trips [Gardner, 2008]. Another Asian country with distinct cycling levels is Japan, which presents efficient integrations

between cycling and public transit modes. Also, bicycle reaches impressive high shares in few European countries, such as 27 percent in the Netherlands and 18 percent in Denmark [Pucher and Buehler, 2008]. However in most other countries, the bicycle has turned to a marginal transportation mode which is rarely used for everyday travel [Pucher and Dijkstra, 2003]. Several countries have been struggling in trying to make the bicycle a more attractive transportation mode, despite considerable efforts from government. Among these countries are the United States, Australia and Great Britain where nationwide statistics suggest that only 1 percent of trips are made by bicycle [Gardner, 2008].

Japan and Great Britain, which are the focus of this paper, present considerable distinct cycling trends. Even though both countries show predominant use of motorized vehicles in central urban areas, bicycle is highly more used for daily-travel in Japan than in Great Britain. Besides accounting for a small proportion of bicycle trips (1% of all trips and 2% of trips of less than 2 miles), Great Britain has been experiencing a recent decline in cycling [DfT, 2009]. In average, national statistics show that nowadays residents make as few as 14 bicycle trips per year, while this number used to be 18 trips per year in 1995 [DfT, 2007]. This decline accounts for 22 percent less bicycle trips per year in national terms. Current cycling shares in the UK are far below the figures in early fifties when cycling used to account for 11 percent of total passenger kilometers [Clark and Page, 2000]. These current figures place the UK among the countries with the lowest national cycling rates. Exceptions are the English cities of Cambridge, Oxford and York, which account for significant bicycle shares (26%, 15% and 12%, respectively) [Ryley, 2006]. These are compact cities with flat landscape, which are beneficial factors for cycling.

Conversely, bicycle is a widely accepted transportation mode throughout Japan. It is used by a wide range of people and for a variety of purposes. Nationwide statistics suggest a rate of approximately 17 percent of bicycle trips during weekdays [MLIT, 2009]. Also, 17 percent of all trips within Tokyo Metropolitan Area are made by bicycle [TPC, 1998], whilst higher figures are observed in specific regions within Tokyo. Examples are the Tama region and Saitama prefecture, where cycling accounts for 20 percent of daily trips [TPC, 1998]. A survey showed that significant rates of elderly people in the three major metropolitan areas (Tokyo, Osaka and Nagoya) decided to give up using automobiles towards using bicycles (33% among people aged 55 to 64 years, and 29% among those aged 65 to 74 years) [MLIT, 2005]. In downtown Sapporo city, bicycle trips doubled between 1994 and 2006 in

comparison with 26 percent reduction in automobile trips and stable rates of trips by train and subway during the same period [Sapporo DfT, 2006]. In 2004, 86 million bicycles were counted in the country, which represented two bicycles for every three people [JFS, 2008].

Another feature of the Japanese transportation system is the high number of multimodal bicycle-public transit trips, particularly in large urban centers. During the last three decades, there was a significant increase in bicycle movements in the surroundings of railway stations. In Tokyo metropolitan area, the proportion of short bicycle trips to the railway stations increased from 4 percent in 1975 to 20 percent in 2005 [MLIT, 2007]. Osaka and Nagoya metropolitan areas experienced changes of 6 to 25 percent and 12 to 35 percent, respectively within the same period [MLIT, 2007]. Figure 1 summarizes the changes of bicycle trips by distance. As a result, from the 1970s, Japan faced the named illegal parking problem. Illegal parking around stations and shopping malls contribute to increasing traffic congestion and the number of accidents in surrounding areas. Besides, the number of abandoned bicycles within urban areas is high. In Japan, the costs related to fixing bicycles are high. Consequently, people often choose buying new bicycles in place of fixing used ones. Recently, government bodies have intensified actions and policies to deal with such problems. Particular attention has been given to improving parking facilities nearby public transit hubs.

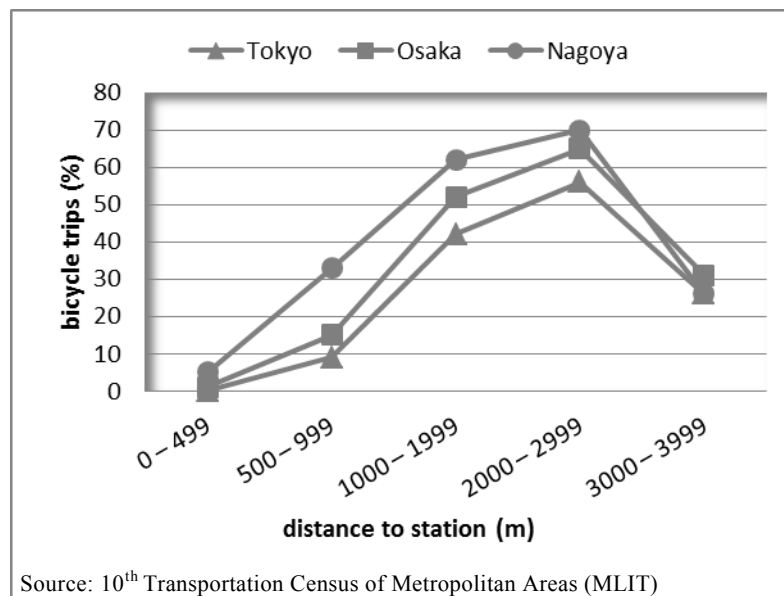


Figure 1: Bicycle trips by distance in the surroundings of railway stations in major metropolitan areas.

4. Bicycle Infrastructure and Services

Bicycle infrastructure and services have been largely accepted as important factors on cycling decision. Studies dating from the 1970s and 1980s suggest that bicycle paths and exclusive lanes strongly affect cyclists' perception of safety and consequently cycling choice [Dill and Carr, 2003]. Cities where cycling is broadly used, are often equipped with appropriate bicycle infrastructure summated to supporting land use and transport policies. In this section, characteristics of bicycle facilities (parking, lanes and paths, bicycle carriage, and working place facilities) in Japan and the UK are compared (Table 1).

Table 1: Main Characteristics of Bicycle Facilities and Services

	Japan	United Kingdom
<i>Parking</i>	<ul style="list-style-type: none">-well established throughout the country, especially nearby train and subway stations, as well as public and private institutions.-recent government efforts have been observed on renewing and improving parking facilities, especially to deal with the named "illegal parking problem".-sharing bicycle parking lots are popular since early 1990s.	<ul style="list-style-type: none">- spread throughout public and private institutions.-recent initiatives from local authorities and also from private companies include renewing parking lots, especially around railway stations.-a cycle hire scheme has been recently implemented in London city (approximately 350 stations were launched with 5,000 bicycles available).
<i>Lanes and Paths</i>	<ul style="list-style-type: none">-currently, most exclusive urban cycleways are used for recreational purposes.-yet to be further improved with specific policies starting from 2008.-most often pedestrians and cyclists share walkway space,	<ul style="list-style-type: none">-reasonable cycling network around the country. Specific cities are fulfilled with lanes and paths.-new program initiated in London to increase cycling network within the city.

	which has been the cause of increase in accidents involving cyclists and pedestrians.	
<i>Bicycle carriage</i>	-currently, bicycles can not be carried in public transit modes in Japan.	-widespread service in the UK, with most trains making bicycle space available. -foldable bicycles can be carried in all public transit modes; and non-foldable can also be carried with some timing restrictions in a variety of modes.
<i>Facilities at working place (e.g. parking, lockers, shower, changing or resting rooms)</i>	-workplace facilities are often referred to parking facilities. -it is not common practice in Japan to offer further workplace facilities, but companies started becoming more aware of this issue.	-offered by a few British companies so as to motivate employees towards cycling. -this kind of service has become more popular nowadays with schools also offering benefits to its employees and students who commute by bicycle.

5. Policies and Strategies

Interest in bicycle promotion is evident at all levels of government in both Japan and Great Britain. However, there are remarkable differences between Japanese and British policies and strategies towards cycling. In Japan, urban transportation plans often treat bicycle and walking as a single mode, despite the numerous bicycle users [Hyodo et al., 2000]. Also, Japanese transportation plans often focus on either implementing bicycle parking facilities around railway/subway stations, or establishing bicycle zones in road intersections. This may be an influent factor of bicycles being greatly used as public transport feeders. Public transport in Japan (particularly rail and subway systems) is highly efficient and offers good

alternatives for daily travel, such as cycle and transit. Under the Japanese Road Traffic Law, cyclists are required to ride on vehicle roads, but may also ride on sidewalks for safety reasons [JFS, 2008]. In practice, cycleways are yet not well established around the country, and a few of those urban cycling routes have been built to accommodate recreational and tourism uses [Hyodo et al., 2000]. In this context, the Japanese government has recently intensified its efforts towards improving bicycle infrastructure provision and achieving higher cycling levels of service. Accordingly, city plans that take bicycle use into consideration have gained popularity in recent years as a way to promote a modal shift and reduce automobile use [JFS, 2010].

In 2008, the Ministry of Land, Infrastructure, Transport and Tourism of Japan [MLIT] has launched a plan to establish an extensive bicycle lane network nationwide. The plan designated 98 cities around the country to work as Bicycle Environment Model Areas so as to achieve more bicycle-friendly environments [MLIT, 2009]. Nagoya city, in central Japan, has one of the most advanced bicycle lane networks in the country, even though its length is only a small fraction of those of some European cities, such as Amsterdam and Paris [Japan Today, 2008]. Besides infrastructure improvement, Nagoya city office, together with a few other companies, has been encouraging its employees to commute by bicycle, by for example increasing bicycle commuting allowances [JSF, 2010]. However, these are not common actions around the country. Other efforts already in practice include cycle hire schemes, which are popular in Japan since early 1990s [JFS, 2008]. Examples of successful cycle hire schemes are found in the cities of Toyama (Toyama Prefecture), Kitakyushu (Aichi Prefecture), Saitama (Saitama Prefecture) and Fujisawa (Kanagawa Prefecture).

In Britain, cycling was somewhat neglected by the national transport policy agenda until the 1990s when it reemerged as part of the Integrated Transport Strategy [Clark and Page, 2000]. During this decade, the UK government launched its National Cycling Strategy, NCS [DfT, 1996], followed by the White Paper on the future of transport [DfT, 1998]. Cycling plans in the UK tend to focus on facilities and provision, such as parking, contraflow cycle lanes and expansion of cycle networks [Ryley, 2006]. Also, specific plans have been developed to deal with localized peak time congestion, such as the “green travel plans” and “school safe schemes”. Green travel plans include specific actions by organizations and businesses towards encouraging their employees on the use of more sustainable transport modes. Popular encouraging actions include financial support for employees on purchasing bicycles and

cycling monthly allowances. School schemes focus on implementing safety measures and training programs so as to get more children to cycle to school.

In 2010, the city of London experienced significant investments in cycling with three major programs being launched. The first is the Cycle Hire scheme, which includes currently 5,000 bicycles distributed among 315 stations (with a total of 6,000 bicycles and 400 stations planned for 2011). The second, the Cycle Superhighways program, aims to improve cycling infrastructure and to implement traffic calming measures. The third, the Biking Boroughs program, includes borough level initiatives to promote stronger cycling support from bodies such as the police, healthcare providers, schools and workplaces. Through these programs, the local government aims to increase dramatically the cycling level in London (target is a 400 percent increase by 2026, compared to the 2001 level) [TfL, 2010].

6. Final Remarks

As discussed in this paper, Great Britain and Japan present distinct cycling characteristics in terms of cycling rates, bicycle facilities, and government policies and strategies. On one hand, Japan has embraced bicycle as part of its main transportation modes with bicycle showing high rates all around the country. On the other hand, it is still to be understood why cycling is not gaining comparable popularity to government efforts in Great Britain. These countries, as almost all other industrialized countries, have witnessed increasing automobile-related problems within urban areas as a result of growing more auto-dependent. Accordingly, both countries have recently intensified their efforts towards achieving more cycle-friendly urban environments. The bicycle is then recognized as a fundamental integrant of the transportation system, and a potential factor in developing more sustainable and inclusive societies in the future.

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