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Promotion and Planning for Bicycle Transportation: An International Overview

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ABSTRACT

International bicycle use, promotion, and planning were studied within the framework of a model project, a "bicycle-friendly town," sponsored by the German Federal Environmental Agency. The results of these international reports were presented and discussed during an international planning seminar in the associated model city of Graz. The results of the reports and the seminar are summarized and an overview of bicycle promotion and planning in western and eastern Europe as well as that in Japan and Australia are given. It has been found that cycling is becoming increasingly popular in many countries, and a large number of measures to encourage cycling are described. The international comparison shows that the types of measures to promote cycling are not limited to simply improving

the bicycle infrastructure. Finally, an attempt is made to summarize those solutions and facilities that have been characteristic of bicycle-friendly cities to determine the ideal conditions for such an environment.

In 1981 a model project (a "bicycle-friendly town") commissioned by the Federal Environmental Agency was begun in the Federal Republic of Germany. The goal of this project was (1) "to create a model infrastructure for cyclists and a climate of opinion which is generally favourable toward cyclists, during a five year developmental period."

This model project centered in two main model cities, Detmold and Rosenheim. Eight subsidiary cities were directly involved in exchanging information and experiences. Foreign cities were also associated with the project.

A special planning seminar was held in Graz, Austria (one of the associated model cities) on international experiences with bicycle promotion and planning. A total of 180 participated in this seminar. Twenty-three lectures were held in which 16 different countries were represented, including 5 eastern European countries and 3 countries from overseas. A three-volume proceedings of the seminar was prepared; it is available from the Federal Environmental Agency (2).

Because this was the first time that bicycle promotion had been discussed by a committee of experts from so many different countries, it appeared to be important to summarize a few of the most important points of the seminar in this paper.

PROMOTION AND PLANNING OF CYCLING

Western Europe

Austria

In Austria, as in many other European countries, not only was cycling not promoted until the mid-1970s, but the little cycling infrastructure that existed had been systematically eliminated. The growing ecological consciousness and the energy crisis caused cycling to be viewed as a potential way of dealing with problems caused by commuter peaks and was incorporated in the transport planning goals and measures by several cities (Graz, Klagenfurt, Salzburg). In Graz in particular, which is a university town with a population of 250,000, special emphasis was placed on cycling. Based on politically determined transport goals, a program to promote cycling was developed. This program, currently in its third year, is not limited to measures to improve the bicycle infrastructure but also includes a broad spectrum of other measures.

Political Transport Goals

Within the framework of the transport concept as a whole (3,4), the share of cyclists (1959, 10 percent; 1973, 7 percent; 1982, 8 percent) in relation to the 1973 statistics will double and the public transit share will increase marginally. These changes will result primarily from a reduction in car use. Besides intensive and coordinated programs to promote walking, cycling, and the use of public transit, car traffic will be greatly restricted. (The first steps in this direction have already been completed.) Thus, parking will be restricted throughout the built-up areas of Graz. In the future, public streets will only be used for short-term parking and as loading zones and permanent parking zones for residents, for all of which fees will be charged (5). Traffic tranquilization, a planning concept found especially in the Netherlands (for example, the "woonerf" concept), Germany, and Scandinavia to restrict and reduce car travel to improve urban environment and road safety, will further limit car travel in the city of Graz. Different aspects of the bicycle promotion program in Graz are discussed in the following.

Bicycle Infrastructure

The bicycle hierarchy consists of main, link, and feeder routes as well as access to residential

areas. Especially in the old city, unconventional solutions to problems of bicycle access have been used; for example, allowing bicycles to use one-way streets in the contraflow direction, allowing cycling in pedestrian areas and on streetcar lanes, and painting bicycle paths red at strategic points. Parking facilities for bicycles are available at designated sections of the bicycle network. Bicycles may be borrowed at all of the branch offices of one bank in Graz. Some businesses have been so encouraged by the cyclist-friendly climate that they have acquired business bicycles.

Traffic Safety Education

In order to encourage the most important target group, school children, to ride bicycles safely, the police and schools offer courses that also test the children after they have completed the instruction. Furthermore, information leaflets on new bicycle routes and safe traffic behavior are distributed.

Bicycle Promotion

Public relations is strongly emphasized as a marketing strategy to encourage cycling. Citizens are kept informed on what is being done, pamphlets are distributed, bicycle maps for the city and surrounding area are available, and the press covers the activities aimed at promoting cycling. Politicians use the bicycle as a means of communication during community information rides (excursions to study local problems and to talk with the citizens). The Idea Market for the Bicycle-Friendly Town was a meeting of experts and other citizens to discuss bicycle promotion. A comprehensive report lists all measures and the institutions that were involved (6).

Planning and Feasibility Study

The effectiveness of the promotional program has been investigated in a feasibility study, which includes surveys of travel behavior and traffic safety and conflict studies of possible problems that might result from the new solutions to bicycle access; the impact of certain measures on the environment has also been studied. Within the framework of the planning and implementation of measures to promote cycling, a method of identifying the priority level of different bicycle networks and quickly carrying out the plans was developed (7, pp.183-190;8).

Switzerland

In Zurich, Switzerland, "new elbow room for the old travel mode" (the bicycle) was developed. As in other Swiss cities, the bicycle (velo) routes are designed to supply cyclists with comfortable and safe travel connections. These bicycle routes are constructed away from the main streets so that the cyclists are not exposed to the exhaust from automobiles. The goal of bicycle planning in Zurich is the construction of an interrelated cycling network 200 km long consisting of bicycle paths, bicycle lanes, residential streets, automobile-restricted zones, and combined facilities for pedestrians and cyclists. Within the network, cycling without detours is to be made possible. Short-term feasibility has been given priority over perfect long-term solutions (9) in the construction of this network.

France

The city of Chambéry in France is impressive because of its community policies toward pedestrians and bicycle traffic. By European standards, Chambéry can be viewed as a model city for cyclists. Traffic tranquilization to reduce car travel in specific areas and the reduction of speed limits within the city limits have led to a one-third decrease in the number of accidents over a 3-year period. Along the main arteries, two-way bicycle paths were constructed by limiting the amount of space available to motor vehicles. Many further improvements for cyclists have been made in Chambéry, for example, permitting bicycle travel on a street in the old city that had been restricted to bus travel, enlarging bicycle lanes at intersections to allow cyclists to line up in front of the cars, and instituting special traffic lights for cyclists. Transport plans in Chambéry are based on the theory that those who travel with the weaker transport mode should have the right of way. If pedestrian traffic is heavy enough, bicycle traffic will be slowed down by constructing bumpy surfaces or creating artificial bottlenecks for bicycles. The manner in which the planning goals are to be achieved is also noteworthy. From the start, the city administration and office of street construction worked closely with environmentalist groups and cyclist organizations. A Dutch planner worked in the city for a week as a consultant on questions related to cycling, so Chambéry could profit by the Dutch experience and avoid planning errors (10).

Netherlands

In the Netherlands, the bicycle is a traditional, frequently used mode of transport for daily use. However, here too, bicycle use decreased in the late 1960s. Thus, in 1975 the government published the first multiyear plan for passenger transport. This plan put special emphasis on the bicycle in order to counteract the negative effects (especially pollution and accidents) of heavy use of automobiles. Within the framework of this plan, two test models were instituted that found worldwide recognition. These were the bicycle paths in The Hague and Tilburg (demonstratie fietsroute). In The Hague (the capital of the Netherlands with a population of 450,000), a bicycle path 4.9 km long crosses the city from west to east. This was built in 1977 and has since been extended 8 km. These bicycle paths are constructed away from the streets, and two-way bicycle travel is usually possible. Planning and construction included various special details to make these bicycle paths comfortable and attractive (11).

In the Netherlands, integrating bicycle and train travel is emphasized. The railway authority in the Netherlands views the combination of train and bicycle as ideal: They complement each other perfectly. In order to increase ridership, subsidized bicycle parking and rentals are offered, and getting to and from the train by bicycle is encouraged. The routes and quality of bicycle paths leading to train stations are being improved; riders are encouraged to leave their bicycles at the new, attractive, and safe parking facilities (which include bicycle parking lots with attendants and bicycle stands that have locks); and rental facilities at the train stations make it possible for passengers to continue their trips by bicycle when they arrive at their destination (12). However, even if the Netherlands is always cited as being the most cyclist-oriented

country or even the country with the most human-transport planning, one should not forget that even in the Netherlands, planning of this sort first has to overcome considerable resistance before it can be implemented (13).

A new passenger transport plan includes, among other things, the Delft demonstration project. This project favors the concept of a hierarchically structured network rather than a bicycle path. This network consists of high-quality bicycle routes for through traffic, bicycle lanes for specific sections of the city, and a neighborhood bicycle network (14). A feasibility study is investigating the impact of the construction of the bicycle network on bicycle use with respect to

1. Number of cyclists in relation to the bicycle network,
2. Willingness to use the bicycle as a means of transport, and
3. Use of the infrastructure (route choice in relation to place of origin and destination) (15).

Great Britain

Until the early 1970s, the use of bicycles had drastically decreased in Great Britain. Since then, however, a new interest in cycling has been observed and the use of bicycles has steadily increased. There are a number of reasons for this: the energy crisis in 1973, the difficulty in finding parking spaces in built-up areas, the increasing concern with physical fitness, the desire to return to nature, and the slowing down in the growth of car ownership.

The government's main responsibilities concern the legal status of cyclists, the legislation under which local authorities provide and maintain facilities and general advice on the design and implementation of such facilities, vehicle performance, national road safety aspects, and supportive research.

In England the three new towns of Stevenage, Milton Keynes, and Peterborough are known as the model towns for cycling; when these towns were planned, separate bicycle networks were included. The Ministry of Transport supports experimental planning concerned with the solution of problems related to bicycle paths and junctions and with possible conflicts between pedestrians and cyclists (16).

Scandinavia

In Scandinavia also, the bicycle is a frequently used mode of transportation. Vasteras and Oxelösund in Sweden are known to be especially bicycle friendly. Vasteras has four bicycle paths leading through the inner city. These paths, additional pedestrian malls, and separate bus lanes are the basic elements of the accessibility of the inner city. Oxelösund (with a population of 14,000) has a network of segregated bicycle paths covering the entire town. Swedish cities are frequently characterized by plans to reduce the amount of car travel, and this naturally encourages cycling. A particularly good example of this is the city of Uppsala. Bicycle travel planning in Scandinavia emphasizes the separation of car and bicycle traffic (segregated bicycle paths are given preference over bicycle paths built along the sides of streets) as well as policies to limit car traffic by keeping through traffic out of certain streets and the widespread introduction of low speed limits (17).

Italy

In Italy Parma and Lucca are noteworthy as planning models. In Parma most private cars are excluded from the old city and the central business district. The bicycle and public buses serve most of the transportation needs of the city. On each of the four routes leading through the inner city, 10,000 bicycle trips versus 4,000 car trips are made per day. In Lucca in the center of the densely built-up old city, there is a large pedestrian mall that can be used by cyclists as well. In spite of this mixed traffic, no major conflicts have resulted (18).

Eastern Europe

First-hand accounts of bicycle travel in eastern European countries provided some of the highlights of the seminar in Graz.

Hungary

In Hungary cycling has recently once again become important. The primary tasks in Hungary are considered to be increasing the safety of cycling and promoting bicycle use in general. In 1980 empirical studies showed that there were some 370 bicycles per 1,000 inhabitants. According to representative studies, the share of cyclists is greatest in small cities (with populations ranging from 20,000 to 40,000) and the smallest bicycle share is in large cities. In small cities 50 percent of all commuter trips are made by bicycle versus 5 to 8 percent in large cities. The annual sales figures for bicycles doubled within the last 15 years. The renewed importance of cycling will be reflected in planning guidelines and in national bicycle promotion programs (19).

Yugoslavia

The importance of cycling is especially emphasized in Slovenia. The city of Ljubljana has not only the longest cycling tradition, but also the most advanced bicycle transport planning. It is the Yugoslavian model city for cyclists. In 1976 bicycle lanes were begun to be marked on the city streets. In 1980 a study dealing with bicycle travel was concluded. The goal of bicycle planning in Ljubljana is the development and extension of bicycle lanes and bicycle paths to make it possible to travel throughout the entire city by bicycle without being forced to make detours. However, parking facilities for bicycles, bicycle rentals, and bike-and-ride facilities are also being emphasized (20).

Czechoslovakia

The previously heavy use of bicycles in Czechoslovakia greatly decreased when the public bus network was extended and the use of cars increased, during the 1950s and 1960s. However, there are signs that the use of bicycles is currently on the rise again. It is estimated that in 1979 there were 364 bicycles per 1,000 inhabitants. Hardly any data on cycling are available, however. A special traffic count in Prague showed a bicycle share of less than 1 percent in 1982, but the bicycle share in the east Bohemian city of Hradec Kralove (with a population of 100,000) is considerably higher. In this city the street circling the city and the main streets of the city have separate bicycle paths and bicycle lanes

with traffic lights that have a special sign for cyclists (21).

Poland

In Poland the ratio of travel by car versus that by bicycle is again beginning to shift in favor of the bicycle. It has been estimated that there are approximately 194 bicycles per 1,000 inhabitants. Although bicycle production has more than doubled in the last 20 years, the demand for bicycles is still greater than the supply. For commuter trips in large cities, the bicycle is the least frequently used travel mode, accounting for only 1.6 percent of all of these trips. In the country, however, it is used much more frequently, especially for shopping trips. Three research centers in Poland have been doing studies on cycling over the past 5 years. Among other things, these studies resulted in a planning concept for a bicycle system for the city of Poznan (560,000 inhabitants). The plan calls for a step-by-step completion of the existing bicycle network until a total length of 200 km has been reached by the year 1990. The goal of this plan is to increase the share of trips made by bicycle to 15 percent of the entire traffic volume (22).

USSR

In the cities of Lithuania, several steps are being taken to increase bicycle use (23). Increasing gasoline costs, health consciousness, and the desire to save time have resulted in an increase in the proportion of trips made by bicycle in recent years. Transport policies support this trend and are aimed at promoting cycling. Siauliai, the fourth largest city in Lithuania with a population of 130,000, is the model city in the USSR. In 1979 the administration of the city started a comprehensive program to encourage cycling as a competitive transportation mode, the first program of this sort in the USSR. The program includes a bicycle network covering the entire city and a recreational area not far from the city, parking facilities for bicycles, areas to practice riding bicycles, service facilities and recreational facilities along the bicycle paths, as well as public relations work. A bicycle factory located in the city organizes annual bicycle festivals. The first bicycle museum is soon to be opened in Siauliai. In recent years, the annual increase in bicycle use has ranged from 15 to 20 percent (24).

Overseas

Japan

Japanese urbanization was accompanied by an improved urban transportation infrastructure, most notably subways and commuter railroads. The majority of daily commuter trips are made with these two transit modes. However, increasing suburbanization made public transit increasingly inaccessible. Therefore, the use of the bicycle as an access mode to the commuter railroads quickly increased, as did the number of bicycles left at the train stations. The phrase "bicycle pollution" was coined and soon turned into a kind of slogan. Comprehensive improvements were made in the space available for parking bicycles. Solutions using new technology have been used.

Until 1978 the majority of the parking facilities for bicycles were owned by private companies. When the parking facilities were expanded, more of the bicycle parking areas were publicly owned but pri-

vately operated. With the new facilities, user fees have become more common. The scarcity of land in Japanese cities has led to the development of high-density parking facilities for bicycles. Two revolutionary technological developments are described as follows.

In the satellite city of Kasukabe near Tokyo, the first fully automated and computerized bicycle parking facility in the world was opened in 1980. More than 1,500 bicycles can be stored in 12 stories; cranes are used to park the bicycles.

In Miratsuka, another satellite city of Tokyo, a new bicycle rental system was introduced in 1980. A 10-story bicycle parking lot offers 500 rental bicycles that can be borrowed by commuters for their daily trips from their homes to the train station and by others for their trips from the train station to suburban workplaces (25).

A systematic city cycle scheme is currently being tested in Sendai (670,000 inhabitants). Bicycles are offered free of charge for an unlimited period of time. These can be borrowed at designated areas and can be returned at a number of different locations (Figure 1).

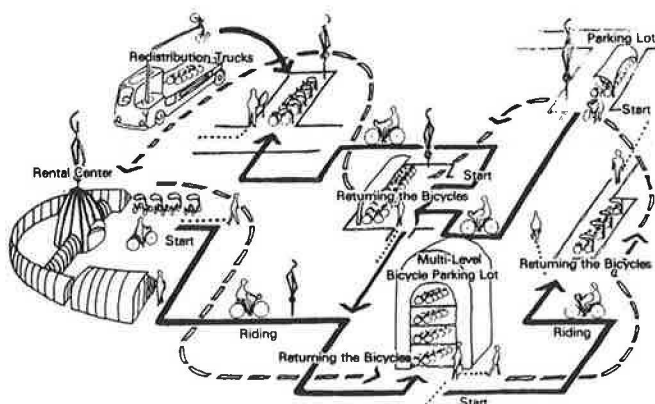


FIGURE 1 City cycle system in Sendai, Japan.

The Japanese experience in combining bicycle and public transit use shows that

1. The bicycle can be used as a popular and effective access and egress mode to the commuter rail system;
2. Bicycle use increases the accessibility radius of the commuter rail system by at least 2 km; this can be a countermeasure to the decrease in the use of public transit caused by suburbanization and the reduction in the population density; and
3. The lack of bicycle paths leading to train stations probably has little negative impact on bicycle use. Cyclists find it more important that their bicycles be protected against theft when they are left at the station.

Australia

With a regionally varying share of 1 to 3 percent, the bicycle plays a subordinate role as a transport mode in Australia. Low gasoline prices and low population densities favor the use of cars. Nonetheless, as a result of increasing ecological awareness, the bicycle has experienced a renaissance in recent years. This has led to an institutionalization of bicycle planning as well as an increased emphasis on bicycle plans in Australia.

Australian bicycle plans are primarily a reaction to the increase in the use of bicycles rather than part of a total transport plan (e.g., to reduce travel with motor vehicles or save energy). This partly explains the shortcomings of these plans, which usually aim at increasing the safety of cycling, analyzing accident statistics, identifying the most commonly used bicycle routes, recommending construction measures, and preparing bicycle maps.

The Geelong bicycle plan, Australia's model bicycle plan, was published in 1977; in 1978 the 5-year implementation period began, which is to cost a total of 4 million German marks. The concept introduced was a four-point bicycle plan:

1. Engineering (technical planning),
2. Education (traffic education),
3. Enforcement (implementation of legislation), and
4. Encouragement (bicycle promotion).

The technical aspects (in which economical solutions were emphasized) began with the design of a bicycle network including bicycle paths, bicycle lanes, speed limits in some residential areas, and much pro-bicycle traffic legislation. In order to educate people to use bicycles safely, a model bicycle education course was developed and introduced in 70 schools. Bicycle promotion is done by using posters, information pamphlets, and contests in order to familiarize people with the improved facilities, traffic education, and special programs (27).

The Geelong bicycle plan has two characteristics in common with a number of other bicycle plans:

1. It is mainly concerned with and designed for existing cyclists; potential cyclists are not emphasized; and
2. No precise data on modal split are being collected or evaluated either before or after the implementation of the bicycle plan. Thus, increase of cycling cannot be precisely measured.

The concept of a bicycle plan as a planning method poses certain problems, which sometimes cause planning failures. Often there is no active and future-oriented planning but only a reaction to a changed situation, that in which there are more cyclists on the road. So the bicycle plan sometimes turns into an end in itself; its implementation comes to be of secondary concern. The emphasis is also frequently on construction without preceding analysis. Thus, some useless bicycle paths are constructed and this naturally results in public criticism of the plan. Furthermore, the four-point principle (engineering, education, enforcement, and encouragement) limits bicycle planning to four factors, which in themselves are not sufficient to create bicycle-friendly cities. The bicycle is not seen as an integral part of the transportation system: the integration of the bicycle and public transport and its interdependence with car traffic are neglected. Bicycle planning is not part of an integrated strategy to reduce the environmental impacts of car traffic. The emphasis is too much on existing cyclists rather than on the population as a whole. Little is done to encourage potential cyclists or to emphasize the social value of cycling.

IMPORTANT INSIGHTS FOR BICYCLE PROMOTION

Current bicycle planning is characterized by three interrelated developments:

1. An increase in the bicycle share during recent years (28);
2. A substantial reserve of potential cyclists, which makes it possible that bicycle use will continue to increase while some use of individual motor vehicles will be diverted (29); and
3. An increasing interest in cycling by transport specialists as well as by ordinary citizens (30).

The planning seminar showed that developments in the field of bicycle planning are international. This supports the thesis that revived interest in the bicycle as a transport mode is not a passing fad but rather part of an international reevaluation of mode choice.

This trend toward increased bicycle use should be supported by transport planners and politicians. Local efforts to promote cycling and unconventional measures seem to have a great impact on increasing the bicycle share. Thus, there is a broad spectrum of effective and economic means of encouraging the use of bicycles. A comparison of international bicycle promotion efforts shows that combining different types of measures is more effective than simply improving the infrastructure for cyclists.

THE BICYCLE-FRIENDLY TOWN

The bicycle-friendly towns show that it should be the main goal of planners to create cities in which the bicycle is accepted as an integral part of the transportation system. To this end, it is also necessary that the transportation infrastructure of the cities be so designed that cycling is safe and pleasant. The following aspects of bicycle promotion are possible and necessary.

Bicycles should be made available to as many as possible. Only if enough people have access to bicycles can the bicycle become a standard transportation mode for all travel purposes. Bicycle availability can be increased by offering rental bicycles and repair facilities for bicycles and by encouraging city offices and businesses to buy business bicycles.

A citywide network of bicycle facilities is needed in order to ensure safe, comfortable, and direct access to all destinations in the city. Intersections should be designed to be safe for cyclists. It should be possible to use the bicycle paths at any hour of the day and night throughout the entire year. On the main bicycle routes, directional signs should be posted just as they are on other streets. The city bicycle network should be connected to bicycle paths leading into outlying areas. Whenever possible, the bicycle paths should be designed so that two people can ride abreast. Adequate parking facilities for bicycles should also be provided to protect the bicycles against theft; lockers for baggage should also be made available.

The bicycle can help support and integrate the use of public transit. Public transportation and the bicycle supplement each other perfectly (31).

In bicycle-friendly cities, the community climate is generally favorable for cyclists. Local conditions, citizens, community politics, and city planning encourage cycling. In these cities, cyclists feel that they are respected and that their needs are taken seriously. In order to achieve a state

that is bicycle-friendly, special efforts should be made to motivate the public, for example,

1. Leading figures in the community should be encouraged to ride bicycles,
2. Private-sector cycle ventures should be supported,
3. Courses should be offered on traffic safety and bicycle skills, and
4. A central office should be set up to distribute information on cycling and act as a consultant in questions concerning cycling.

Local governments can effectively promote cycling if there is the political will and the organizational framework. Local-government transportation programs should include

1. A bicycle promotion program that analyzes the current cycling situation and outlines short-, medium-, and long-term plans;
2. Separate funding for bicycle-related programs;
3. An administrative work group on the bicycle;
4. Citizen involvement in bicycle planning and input from representatives of bicycle groups when bicycle plans are being made; and
5. A central office for bicycle promotion responsible for bicycle ventures and bicycle coordination.

Bicycle planning should also take the general planning needs into consideration; it should be community and citizen oriented and flexible. Economical solutions should be given priority. Such planning should be ecologically sensitive.

A bicycle-friendly city is not a utopian vision; it can actually be realized. However, administrative and financial backing is needed if this goal is to be attained.

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