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Bicycle-friendly Housing Developments

Abstract of Research Report

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In a time of growing environmental awareness and rising fuel prices, eco-friendly modes of transport are gaining in importance. It was the **goal of the present study** to survey and analyse the mobility behaviour and in particular the bicycle usage of the residents of bicycle-friendly housing developments. The initial thesis assumed that project developers can make a vital contribution to cycling promotion by designing and constructing bicycle-friendly housing developments.

In the context of the research project, the following **housing developments** were analysed:

- **Bike City**: bicycle-friendly housing development in Vorgartenstrasse with a reduced number of car parking slots as compared to the legally mandatory contingent
- **Wohnen am Park**: conventional housing development in Vorgartenstrasse
- **Bike & Swim**: bicycle-friendly housing development in Vorgartenstrasse with a reduced number of car parking slots as compared to the legally mandatory contingent
- **Autofreie Mustersiedlung (Car-free Model Housing Project)**: housing development between Donaufelderstrasse and Nordmanngasse whose residents voluntarily forgo car ownership

The study was conducted by means of a **written survey** to interview all households. In addition, an expert round served to discuss the experience made by architects and project developers with the housing developments analysed and to evaluate these findings qualitatively. The survey took account of socio-demographic data, the availability of the various means of transport and the trips taken on a given reference day. Moreover, questions were asked relating to cycling, the motivations for choosing a specific housing development and housing quality satisfaction. Satisfaction with the bicycle-related infrastructure was separately determined.

A comparison of the transport-related **motivations for choosing a particular housing development** highlights the great importance of good public transport connections for all housing developments. For all housing developments, aspects relating to bicycle traffic were located in the middle range of motivations; for the housing developments Bike City and Bike & Swim, they were slightly more important than for the two other housing developments. Car-related aspects were in the lower third of motivations for all housing developments.

There were marked differences regarding **satisfaction** with bike storage and parking facilities across the housing developments. In the developments Bike City and Bike & Swim, satisfaction is very high; it is high in Autofreie Mustersiedlung and low in Wohnen am Park.

Satisfaction with the hook-up to cycleway and public transport networks is lower in Autofreie Mustersiedlung than in the housing developments in Vorgartenstrasse.

The **availability** of bicycles is highest in the housing development Bike City and lowest in the housing development Wohnen am Park. Differences in car availability among the housing developments in Vorgartenstrasse are surprisingly small.

Table 1: Availability of means of transport per household

	Bike City	Wohnen am Park	Bike & Swim	Autofreie Mustersiedlung
Bicycles per household [1)]	3.09	1.80	2.03	2.44
Cars per household [1)]	0.66	0.73	0.56	-
Rented car parking slots in housing development per household [1)]	0.53	0.54	0.48	-
Available car parking slots in housing development per household [2)]	0.56	1.00	0.45	-

[1)] In relation to occupied flats [2)] In relation to entire housing development

In the housing development Wohnen am Park, compliance with the legal requirement of providing one car parking slot for every housing unit entails oversupply and hence vacant parking slots. Conversely, the residents of the housing developments Bike City and Bike & Swim own more cars than there are available parking slots. Since some residents consequently park their cars on the street, however, the availability of slots in the underground car park largely corresponds to demand. These findings raise questions regarding truly adequate provisions for regulating the availability of parking slots.
The number of trips taken per mobile person and day are similar in all housing developments. Marked differences were identified with regard to **mode choice**.

Table 2: Trips per mobile person and workday (persons aged 18 to 64 years)

Means of transport	Bike City	Wohnen am Park	Bike & Swim	Autofreie Muster-siedlung
Trips, total	3.93	3.84	3.71	3.90
On foot	1.26	0.89	0.95	0.90
By bicycle	0.76	0.25	0.64	0.87
By motorised individual means of transport	0.53	0.96	0.51	0.19
By public transport	1.37	1.75	1.61	1.94

The residents of Autofreie Mustersiedlung make the highest number of daily trips by bicycle. Fig. 1 shows the workday mode choice of persons aged 18 to 64 years. In the housing developments Bike City, Bike & Swim and Autofreie Mustersiedlung, the bicycle traffic share is markedly higher than in Wohnen am Park. In the first three housing developments, both the objective of the Transport Master Plan (8% bicycle traffic share on workdays) and that of the Viennese coalition government agreement (10% bicycle traffic share) are clearly exceeded. In all housing developments analysed, the share of public transport is very high.

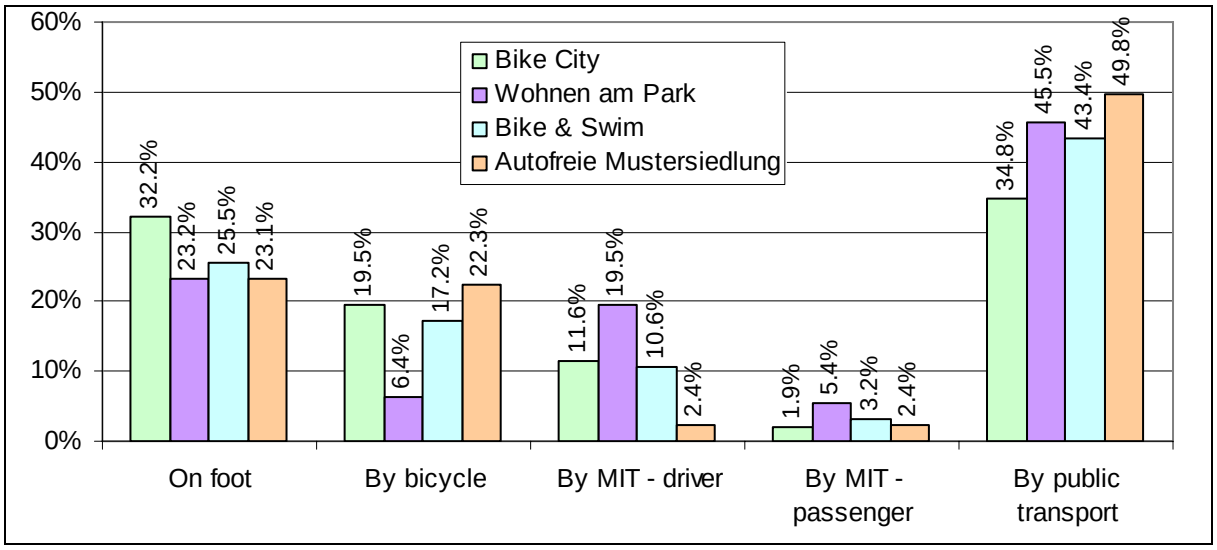

Fig. 1: Mode choice on workdays (persons aged 18 to 64 years)

With respect to private car availability, differences between housing developments are considerably less pronounced than with respect to mode choice. In the housing development Wohnen am Park, the share of motorised individual traffic is roughly twice as high as in the housing developments Bike City and Bike & Swim. This is remarkable because car availability per household is only by 11% higher than in Bike City and by 30% higher than in Bike & Swim. The low share of motorised individual traffic in the housing developments Bike City and Bike & Swim shows that the bicycle-friendly design of these housing developments entails reduced car usage despite similar car availability. Autofreie Mustersiedlung occupies a special place in this respect since its residents voluntarily forgo car ownership.

Thus the varying **intensity of bicycle usage** is essentially due to the following reasons:

- a positive attitude to cycling on the part of residents of bicycle-friendly housing developments. The possibility of bicycle usage was already taken into consideration – at least to a degree – when choosing a flat.
- availability, high quality and good accessibility of bicycle parking and storage facilities. This is also reflected in the survey findings for the housing development

Bike & Swim, where approx. 15% of residents stated that they use their bicycle more often than before moving to this development due to improved parking facilities.

Moreover, the findings permit the assumption that persons with little interest in using the bicycle before moving to bicycle-friendly housing developments were motivated to do so in their new surroundings. In addition to bicycle storage and parking facilities, the prominence of the bicycle as a means of transport in the housing development and a certain model effect created by other cyclists may play a role here.

Key aspects for mode choice also include the location within the municipal territory, the residential environment and the quality of public transport and cycleway connections. The mode choice parameters of the bicycle-friendly housing developments in Vorgartenstrasse can thus not be directly applied to **other locations**. However, it may be expected that a bicycle-friendly design of housing developments in other locations will result in a similar relative change of mode choice, i.e. increased bicycle usage as compared to conventional housing projects.

The findings of the present survey confirm the initial hypothesis that housing developers can make an important contribution to **cycling promotion** by providing for bicycle-friendly design of their projects. The residents' requirements and needs regarding bicycle-friendly design derived from this survey confirm and help to further detail the corresponding regulations and guidelines:

- **number of bicycle parking spaces:** the survey identified a demand of 2.5 to 3.0 bicycle parking spaces per household, which largely corresponds to current legal requirements under the Building Code for Vienna (1 bicycle for every 30 sq m of useful floor area). In addition, the spaces needed for bicycle trailers, scooters and other non-motorised vehicles (e.g. tricycles) must be taken into account, since experience shows that these, too, are sometimes parked in bicycle storage rooms.
- **location and accessibility of bicycle storage rooms:** bicycle storage rooms should be ideally located at ground-floor level and, if possible, should offer direct access to the streetscape. Access via only few, easy-to-operate doors with locking devices was often mentioned as a desideratum. This is particularly important for bicycle trailers. Additional storage facilities on the upper storeys and hence close to the flats are appreciated if lifts are sufficiently spacious. The size of the lifts of the housing developments Bike City (1.4 x 1.6 m) or Bike & Swim (2.15 x 1.05 m) and a clear door width of 1.0 m should be considered as minimum dimensions.
- **equipment of bicycle storage rooms:** the installation of bicycle stands that permit locking bicycle frames is recommended, as this safeguards efficient protection against theft. Wall-mounted devices should be avoided, as their level of user

convenience and theft protection does not correspond to the requirements of cyclists. To enhance theft prevention (social control), bicycle storage rooms should be clearly visible from the staircase.

- **bicycle parking spaces for visitors:** bicycle parking spaces for visitors should be easily accessible and clearly visible inside the housing development or in the street close to the entrances to the development. Residents, too, may use these for short periods.
- **service facilities** such as a pump station for bicycles, a bicycle washing bay and an adequately equipped bicycle repair shop likewise increase user convenience for cyclists.

The expert discussion moreover permitted drawing the following conclusions:

- the **interpretation of the fire regulations** for Vienna should be reconsidered with regard to bicycle parking and storage. At the moment, innovative bicycle parking options, e.g. in niches beside arcades such as in Bike City, can be implemented either not at all or only with great difficulty.
- compliance with the **legal provisions of guaranteeing a certain number of car parking slots** in some cases leads to vacancies in underground car parks. It would make sense to save the expenses or use these spaces for other facilities of the housing developments.
- other **(mobility-) themed housing projects** are unanimously considered desirable. Such flagship projects are trailblazing for housing construction and sharpen the focus on specific issues. Since such housing developments attract like-minded persons, social contacts are intensified, which strengthens community spirit.

  The further diversification of mobility aspects by including mobility management processes fine-tuned to specific housing developments and accompanied by appropriate measures is viewed as very important.

There remains a manifest **need for research** into the actual demand for car parking slots and the effects of bicycle-friendly design of housing developments in different locations across the municipal territory of Vienna.