Attractiveness of bicycle-facilities for the users and evaluation of measures for the cycle-traffic

Wolfgang Bohle, Planner, Planungsgemeinschaft Verkehr
Große Barlinge 72 a, D - 30171 Hannover, Germany
PGV-Hannover@T-Online.de

Summary

In a recent research project for the german ministry of transports, an investigation was made on the elements of a bicycle network and on the bicycle-facilities that are most attractive for the cyclists. The elements that the interviewed cyclists regard as positive or as negative may describe criterias of subjective attractiveness. An evaluation concept based on these user-criterias, and integrating other criterias that are important for the authorities running the bicycle-infrastructure, may serve to set priorities and to assess route-variants or alternative bicycle-facilities.
In general, major-roads for the cyclists are the most unattractive element of cycle networks. Already at rather low volumes of motorized traffic, for the cyclists it gets important to be separated from the car traffic. Built cycle-tracks are, with regard to the feeling of subjective safety, for the users slightly more attractive than marked cycle-lanes on the level of the carriageway.
Minor roads offer a much higher attractiveness, but this may be impaired by elements of speed-reduction for car-traffic. The most attractive element of networks are cycle-tracks with an own alignment, as e.g. in green areas, but they may cause a lack in social safety.

1. Aim and method of the research project

In several countries, the planning of bicycle-infrastructure is based on assessment methods that e.g. serve to set priorities or to assess alternative cycle-routes or cycle-facilities. Most of these methods are concentrated on safety aspects and on the number of cyclists benefiting from a measure. Some planning authorities work with cost-benefit-investigations. Only few of the actual evaluation concepts integrate specific user-criterias.
Therefore, in a recent research-project for the german ministry of transports an investigation was made on the criterias that may describe the subjective attractiveness of bicycle-infrastructure for the cyclists in everyday-traffic. It was investigated at different cycle-routes:

- which elements of the bicycle-infrastructure and of the surrounding the cyclists perceive,
- which elements they regard as positive or as negative and
- how important these elements are for the cyclists.

About 1.500 cyclists were interviewed at different types of cycle-routes and cycle-facilities in built on-areas, such as:

- built cycle-tracks at roads with an important through-function for motorized traffic (major roads);
- marked cycle-lanes on the level of the carriageway at major roads;
- major roads with a mixed profile for cycles and cars;
- minor roads with access-function for car-traffic and a mixed profile; and
- cycle-tracks with an own alignment within green-areas.

In addition, some group-discussions pointed out:
- why built cycle-tracks and marked cycle-lanes are different in their attractiveness for the cyclists, and
- there was asked after the subjective desire to be separated from car-traffic.

2. Results

In general, major roads for cyclists are the most unattractive element of cycle-networks. Using the carriageway is much more unattractive then using cycle-lanes or cycle-tracks. The most important criteria of attractiveness is the separation from car traffic. Some cyclists wish to be separated already when the volume of motor-vehicles reaches 2.000 veh./24 hours. Most cyclists wish to be separated at a slightly higher volume of motor-vehicles.

Cycle-tracks with a dividing-verge to the carriageway and with sufficient wide foot-paths at their side, for cyclists are slightly more attractive than marked lanes. On cycle-lanes, the proximity to car traffic impairs the feeling of subjective safety. On cycle-tracks, there often are more encounters with pedestrians impairing the comfort of cycling, but as the feeling of subjective safety for most of the users is much more important than the comfort, cycle-tracks in general are more attractive than cycle-lanes.

In comparison to major roads, minor roads are much more attractive because of the lower volume of cars. But some elements to reduce the speed of cars - such as speed control humps or a narrowing position of parking vehicles - may impair very much the subjective attractiveness. These elements therefore e.g. should offer cycle-passages beside them. A network element offering a specific high attractiveness for the users are „cycle-roads“ where cyclists may ride side-by-side on the carriageway and where the speed-level of cars is reduced to the level of cyclists.

Cycle-tracks with an own alignment, e.g. in green areas, are especially for through-riding cyclists the most attractive element of cycle-networks. On the other hand, they impair the feeling of social safety. Many women and children choose other routes in the dark daytime, so there should be offered alternative routes with a higher level of social safety too.

3. Evaluation procedure

The elements of the bicycle-facilities and of the surroundings named by the interviewed cyclists were summarized and defined as user-criterias of subjective attractiveness. These user criterias were integrated in an evaluation procedere which describes the attractiveness as following:

Criteria	Measured by	Advantage of subjective attractiveness
Speed level of motorvehicles	v_{85} or speed limit	Advantage of network section with lower speed
Volume of motorvehicles	vehicles per day	Advantage of network section with lower volume
Separation from car traffic	Type of cycle-facility	At ore than 5.000 veh./day: Cycle-track > Cycle-lane >mixed profile
Width of bicycle facility or of carriageway		Advantage of network section or cycle-facility with a larger width
Encounters with other cyclists	Number of cyclists in opposite direction on one-directed cycle tracks	Advantage of network section or cycle-facility with less cyclists in opposite direction
Surface quality	Type of surface	Asphalt or concrete > sand surface > cobble surface
Encounters with parking cars	Distance to parking cars, number of occupancy-changings	Advantage of network section or cycle-facility with less encounters
Encounters with pedestrians	Width of pedestrian path beside cycle-tracks, number of pedestrians crossing cycle-facility	Advantage of network section or cycle-facility with less encounters
Number of intersections	Number of intersections	Advantage of network section with less intersections
Regulation at intersections	Number of stops at intersections	Advantage of network section with less stops
Special details		Advantage of network section or facility with less lack of comfort caused by special details
Noise	Noise immission on cycle-facility	Advantage of network section or facility with lower noise immission
Feeling of social safety	- Length of section without other people - Length of section with bad insight - Length of section with without lighting	Advantage of network section or cycle-facility with - more other people at surroundings - better insight - better lighting
Experience of surrounding	Trees, watercourses Intensity of mixed using of buildings	Advantage of network section leading along trees, watercourses or more intensive mixed using

In combination with the criterias:

- Function of an element within a cycle network and number of cyclists,
- Objective traffic safety,
- Integration or conflicts of the cycle-facilities and the facilities for pedestrians, cars, public transports etc.
- Costs

the communities or the state that run the bicycle networks may use an evaluation concept integrating user-criteria's based on an empirical investigation. The subjective demands of the cyclists in some cases may

lead to specific conflicts - as e.g. with regard to the facilities fitting best for objective traffic safety or with regard to the costs -, but on the other hand, a cycle-infrastructure of high quality for the user may invite more people to use the cycle in every-day traffic.