

# **Cycling infrastructure design and urban public space**

## **A comparison of cycling design manuals**

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The use of public space is often presented in terms of conflicts: which are the desirable assignments for such or such space? The circulatory function has often been privileged at the detriment of other types of use, and in particular the social function. In the space devoted to traffic, vehicles competed between them to obtain the necessary space for moving and parking. Within this space of circulation, motorised traffic has often priority on pedestrians and cyclists. How can these users, whose modes do not have only a function of movement but also take part in the animation of public space, can find their place? Which place is granted for them? The consequences of this “adaptation of the city to the car” were only little evaluated a priori, because of the progressiveness of the phenomenon. To answer the specialisation of these spaces, increasingly dedicated to a growing motorised traffic, different mono-functional spaces were imagined, such as pedestrian areas. Urban public spaces have been affected to a particular function: to one category of user, corresponds one type of space.

In the same time, the growth of the automobile traffic has led to the quasi-disappearance of the cyclists in traffic. However, cyclists safety is quite a well known subject, as it is one of the main hindrance to bicycle use in urban areas: potential cyclists apprehend to find themselves in the middle of a dense and fast motorised traffic.

By combining these two questions, safety and specialisation of space, one raises the question of cycle facilities, space intended for a precise category of road users, cyclists, and supposed to give them a high degree of safety.

Cycle facilities makes it possible to underline the place of the cyclist on the road, therefore to legitimate its presence, while ensuring him, in theory at least, a better safety. They are often apprehended like a technical question, intended to solve the problems encountered by only one category of users. It is considered like an addition to the road network, but seldom integrated with the whole of the traffic system, just as the cyclist is not considered as a road user with whole share in the roadway system, but rather as an additional user.

In the building of roads, standards of construction occupy a prevalent place, often to the detriment of the optimal adaptation to the context, and to the inventiveness necessary to produce spaces which are not only traffic-orientated but have also to ensure urban functions. Devoted facilities should, for technicians, meet standards. There is thus a very strong demand for cycle facilities handbooks, providing standards and/or recommendations, demand all the more keen since the questions relating to cyclists traffic are often tackled only marginally in the training of the engineers and planners.

### **The corpus**

Four manuals have been analysed in-depth: Dutch, Belgium, Swiss and Quebecer, and of course a very close look has been made to the French one. However, it exists some other manuals, (German, Finnish, Australian ...). They have not been included in the main corpus for various reasons.

## **1. Cycle facilities**

### *1.1. Definition*

Very few manuals explain what they include under the term “cycle facility”, but it can be seen through the tables of contents. We have adopted the following definition: any facility (infrastructure or not, punctual or linear) specifically intended for the cyclists and not intended, by design, to be used by other road users (except if explicitly planned). It includes:

- linear infrastructure: cycle tracks, cycle lanes, shared-used lanes or pavement (with buses, pedestrians, mopeds...), partial one-way traffic streets,...
- traffic control devices: road marking, signpostings
- bicycle parking
- lighting
- other facilities

Of course, there is other facilities which are cycle-friendly, but not specifically designed for cyclists: zone 30, pedestrian areas, ... They are seldom analysed in the design manuals.

### *1.2. Why designing cycling facilities?*

All the handbooks expose different types of facilities, give recommendations for dimensioning, show examples, recall regulations. But they justify little why to do these facilities. Indeed, what is the use for cycling facilities? why have they to be done? Is the existing road network not sufficient? or inadequate for cyclists? What are the arguments developed?

The Quebecer guide pre-supposes that cycle use is limited by the lack of facilities: “The mileage of cycling facilities developed here is quite low and is not enough to answer to the increasing demand. (...) Many cyclists limit their bicycle trips only because the road network does not give enough cycling space or has obstacles difficult to bypass. (pp. 1-2) For the Quebecers, doing cycling facilities would allow to develop the use of bicycle.

The other goal is linked to road safety concerns: “With a plain increase of the popularity of the bicycle during the 80’s the number of cyclists on our streets has increased considerably leading to an increase in the number of accidents in which cyclists are involved.” (p. 3)

The Belgium guide (1996, p. 5) speaks of “stimulating a safe and comfortable use of the bicycle (...) based on:

- itineraries for bicycles: grid network of high quality links between the main destinations, outside or inside the general traffic (...),
- an adapted infrastructure (...).”

The Dutch manual underlines that “The construction of cycling facilities is no aim in itself. The aim of the customer-orientated highways authority should be to provide cyclists with the most direct, attractive, safe and comfortable route possible within a coherent cycling-network. (...) Because bicycles need to share road-space with motorised traffic, which is larger and faster than the bike, it is often necessary to construct specific cycling-facilities out of concern for safety and comfort. Apart from this it may be necessary to provide these facilities because motorways, waterways and railways have cut through numerous routes which were used in the past by slow-moving traffic.” (p. 8) So the aim of the facilities seems to be in this case to separate the motorised traffic apart from the bicycle one, with, as a consequence, arguments based on safety and restoring the continuity of itineraries.

Only the French manual underlines, that “In urban areas, the best way to integrate the five requirements (safety, coherence, directness, attractiveness and comfort) is to moderate traffic at around 30 km/h and not to do any specific cycling facility, the aim being to facilitate mixed use.” (RAC, p. 8)

But it goes further: “On all the other urban roads, where the speed can not be reduced to this minimal level, some particular treatment have to be considered. In interurban areas, the highways authority have also to question themselves on what to do to facilitate, with the highest level of safety, cycling trips. That’s why the guide list the main characteristics of all kind of facilities which can be seen.” (p. 8)

In the same way, the Swiss guide (1991) stresses that “ the number of kilometres of cycle track does not influence the desire of the cyclists for using or not their vehicle (...) The problems caused by the bicycle must be regulated on the ground; on the road itself and not aside.” (guide 1988, pp. 6-7) But the manual rather insists more on the type of facilities to make or not to make than on their justification.

This weak global argumentation of the interest that there is to make cycle facilities is in itself interesting. However, in detail of the chapters, the majority stress that cycle facilities are in general necessary only where a policy of moderation of traffic is not possible.

We chose to focus our research on urban (and periurban) areas. The handbooks in general also include rural zones and interurban areas. It is perhaps in these spaces that cycle facilities are the most necessary, on the main road in particular, because of motorised traffic high speed. But the cycle adjustments of roadway system are often easier there to integrate because of the greatest availability of space. And their presence does not have impact on public space, with the “traditional” meaning of the term, these spaces providing only a function of circulation.

## **2. The ambivalent status of the bicycle**

The bicycle is considered by all the highway codes as a vehicle. But the specificity of its mode of propulsion makes it a vehicle close to pedestrian (this being consolidated in French by the vocabulary: “v  lo” used for “v  locip  de”, which means fast pedestrian). And in all countries, a cyclist pushing its bicycle is assimilated to a pedestrian.

This ambivalence of statute makes that the solutions in technical terms are not always easy to find. Indeed, temptation is large to assimilate the bicycle to a quasi-pedestrian (who can be reflected in the case of the shared pavements for example), or on the contrary to a specific vehicle requiring to specific facilities which is the transposition of the road way for one category of users.

The problem inherent in the bicycle is that it is often not regarded as a “real” vehicle by the car drivers (differences in speed and gauge), but the cyclist is not a pedestrian. For the pedestrians, the bicycle remain a vehicle.

However one can wonder whether the problems observed in the “ cycle networks “ are not due precisely to the fact that this “specificity” of the cyclist is translated into specific facilities. It would seem to us that rather than specific cycling facilities, the solutions to improve the conditions of traffic for cyclists are no dedicated facilities, but streets opened to all the modes, flexible and adaptable enough to allow all the uses and to offer an access to all the kinds of traffic.

## **3. The three main approaches**

We think there is three main approaches for the realisation of design manual for cycle infrastructure:

- a normative and technical approach, copied on the road handbooks (at least within the conceptual framework),insistent on the building of infrastructure for a specific category of road users,
- an approach based on the specificities of the cyclist and its vehicle, and from there proposing solutions based on the problems encountered by these road users in traffic. This approach could be described as behaviourist,
- and finally a more regulatory approach of the question, which can be related to modifications in the Highway Code.

The 1990 Belgian manual is very much orientated towards the regulation. It was elaborated with an aim of allowing a good application of the modifications made in the highway code, to better take into account cyclists. The new texts are included in the 1990 edition and an explanatory synthesis is in the appendix of the 1996 guide.

The Swiss handbook insists on the other hand on the specificities of the cyclist. The determination of the cycle facilities widths, which leads the guide to propose five types, is based on the amount of space necessary to the various types of cyclists. The guide does not propose any solution in term of facilities and only show (successful) examples. The Swiss standards take again this approach based on specificities of the cyclist and his vehicle.

The Dutch manual seems to be more normative, even if in the introduction defends itself to give ready-to-made solutions. “This Design manual collates existing knowledge, introduces a number of new approaches and suggests optimum solutions as seen from the cyclist’s viewpoint. “ (p. 9).

However, in the various chapters, the level of precision of the recommendations given, the abundance of figures, the number of tables making it possible to know in which situation one is and thus the measures to be taken in this precise case, strongly moderate this introductory sentence. Cycle facilities seem to be apprehended like traditional road infrastructure, which on one side includes the bicycle in the category of vehicles, but in the same time perhaps confers it a particular statute which does not take completely into account its specificities.

The quebecer guide has a very encyclopaedic approach, and quite technique. It approaches cycle facilities like autonomous entities, with relatively little link with their environment.

While reading these handbooks, it appeared to us in a very fundamental way the fact that one could not be unaware of which were the subjacent designs of the urban road networks in the various countries. These designs have obviously implications in term of implementation of cycle networks and in the choice of the types of facilities. The urban structure and the morphology of the cities are obviously explanatory elements of these choices, but they do not seem to be sufficient to explain the designs in work.

#### **4. Cycling network**

Almost all the handbooks insist on the concept of “cycle network” like an essential element of a cycle policy. Only the Swiss handbook does not tackle in a detailed way this question.

For a cycle network to answer the general standard of a network, it would be necessary that each point of the territory is made accessible with acceptable conditions of safety and comfort by all the cyclists. The current system of urban roadway network thus does not usually answer these requirements, not in term of access, but the conditions of safety and of comfort are not always filled, thus the building of cycle facilities.

But the plans of cycle facilities, the cycle networks, seem more often to be perceived like the adjunction of an additional network, in which facilities are the visible part, to the traditional road network than like forming part of the road network itself.

In the 1996 Belgian manual, the chapter devoted to this subject (p. 19), stresses that “except exceptions, in built-up areas, all the streets constitute a network inside whom the cyclist chooses his best way, often the shortest.” The goal of the creation of a network of cycle routes is to concentrate the cyclists on these routes, where the conditions of safety and comfort are satisfactory. A network is not only constituted of cycle facilities. The black spots must be the object of a detailed attention, so that continuity and safety are guaranteed. And the chapter concludes: “One of the principal advantages of this approach is the attracting character of a coherent network, thanks to which more and more of people will use the bicycle.”

The quebecer handbook devotes a chapter to the planning of cycle facilities. “Like any project of development of infrastructures of transport, the development of cycle facilities has to go under a planning process. (...) The development of cycle facilities must go hand in hand with the concept of network.” (p. 5). The cycle network is however considered only through the use of the cycle ways (...), and can include related facilities, such as parking spaces for bicycles, rest areas or shelters for cyclists. From there, a strong importance is given thereafter to the planning of cycle facilities. The network is considered here like an autonomous entity, adding again itself to the traditional road network. As in the Belgian handbook, it is specified that “high profile cycle facilities can encourage people to use their bicycle more.” (p. 5) It should however not being forgotten that urban structure and traffic conditions in Quebec are rather different from the one that prevails in Europe.

According to the Dutch guide, the cycle network must be arranged according to a three-tier hierarchy: access, distributor and through roads. The objective is that 70% of the distances are done on through routes, which are the roads where the quality is the highest. The network must answer a certain number of criteria. The cyclists must always have the choice between two routes to go from a point to another, of which one at least is socially secure. The detours have to be minimised, just as the frequency of crossing with the motorised traffic, in order to improve safety (from where the building of cycle networks separated from the general circulation).

## **Post-routism**

In reaction to this importance attached to the cycle networks, which often results in “network of cycle facilities”, some developed another approach. This idea of cycle network like base of a cycle policy, and generally resulting in the realisation of specific installations, is called into question by some.

Post-routism can be defined as an acceptance that the most appropriate way to plan for more cycling is to adopt a more holistic approach, rather than concentrate on cycle-routes and cycle-networks.

According to Budd, “Without knowing it, we had become trapped by the concept of cycle-routes, cycle-networks and “routism”. (...) Cycle planners must recognise that even the largest cycle-network plans will only provide for some cycle journeys. Most trips will have an origin or destination on ordinary road, and for local journeys it is unlikely that it will coincide with a cycle-route. Plan now for a few high quality dedicated cycle-routes through our towns as a part of a national network, particularly for novice riders, or those returning to cycling after a long break. However we must recognise that the prime need is to make our existing road safer for all users groups. What cyclists really need: a post-routism approach to cycle planning – where cycling is integrated into a safer network of ordinary roads.”

The highways authorities create cycle networks according to the same conceptual framework as the road networks. But while trying to distinguish by specific facilities the cycle and road networks, a kind of dead end is reached. It is not very probable that a cycle network will be as extensive as the road network. The concentration of the means on the cycle network usually involves a deterioration of the situation everywhere else for the cyclists.

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