CMbike
Central MeetBike

Fact Sheet H-02 – Cycling Facilities on the Road

Overview

Street space is a limited resource. The process of street design must therefore take into account the demands of all street users under consideration of the surrounding land uses and the function of the street. Contrary to the historical emphasis on the flow of motor vehicles, Cycling Expertise Fact Sheet I-02, in reference to German guidlines [FGSV (2010)], emphasises that street design should be considered "from the edge of the road to the middle" [Thiemann-Linden (2010), p.2], ensuring that pedestrians and cyclists are taken into consideration even when road width is limited.

Due to space and safety considerations it is not always possible or advisable to provide separated infrastructure for each road user group. The choice of cycling facility depends to a large extent on the available street space and the speed of motorised traffic [FGSV (2010)].

Cycle provision on urban roads can be classified into:

- Mixed traffic on the carriageway
- Advisory lanes
- Bicycle lanes
- Dedicated combined bus and bicycle lane
- Bicycle streets

Main Considerations for Dividing Street Space	Additional Criteria
Road type within the transport network and predominant surrounding uses (are significant levels of pedestrians, cyclists or deliveries to be expected?)	Frequency of junctions and property access points (amount and frequency of turning vehicles) - the greater the number and higher the frequency of turning vehicles, the greater the need for keeping cyclists on the carriageway)
Presence of public transit	Proportion of heavy goods vehicles
Expected volumes of motorised and non-motorised traffic	Type of vehicles parking along the street - turnover frequency (how often are vehicles pulling in and out), double-parking, amount of delivery vehicles, etc.
Width of available street space	Street gradient

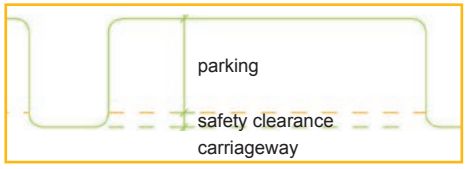
Table 1: Considerations for division of street space amongst road users (based on FGSV (2006), p.15 and FGSV (2010), p.20p)

Types of cycle provision

The initial approach when choosing a type of cycle provision in German guidelines typically depends on carriageway width, car traffic volumes and motor vehicle speeds along with the four main considerations listed in Table 1.

In general, the higher car volumes and speeds are the greater the degree of separation between cyclists and motorised traffic. However the type of cycle provision should be decided on a case-by-case basis whilst considering the four main points listed above as well as the additional criteria.

Mixed traffic is recognised in German guidelines as generally acceptable for streets with narrow carriageways and low traffic volumes (< 700 vehicles per hour (veh/h)). Some carriageway widths can be problematic when a driver tries to overtake a cyclist against oncoming traffic (see Safety Considerations on next page). If there is kerbside car parking a clearance distance needs to be maintained between cyclists and parked cars, for example by extending the kerb at certain intervals between parking spaces (see image above). In general, mixed traffic is the standard in speed 30 zones, where car volumes are low.



Whenever the attention of drivers needs to increased due to the presence of cyclists, **pictograms** might be a feasible measure since they are already often used in the Czech Republic. Even though this is not a legally reserved space for cyclists, experiences from the Czech Republic show that

pictograms are unlikely to be crossed by cars unless they have to avoid oncoming traffic.

Advisory lanes are indicated by dashed guide markings on the carriageway. They act as a suggested cycle lane and should be used on streets that are too narrow for mandatory bicycle lanes. They may be crossed by motor vehicles only when necessary, e.g. in the case of oncoming lorry traffic. For this reason advisory lanes are not recommended for streets with a high volume of heavy goods vehicles (HGV). Additionally, car speeds should not exceed 50 km/h.

Bicycle lanes are mandatory, dedicated lanes for cyclists and separated from motor vehicle lanes through a continuous lane marking. Cycle lanes can be considered for use in streets with motor vehicle speed limits ≤ 70 km/h as long as motorised traffic flow does not exceed approx. 500 veh/h. In general, however, speeds limits on urban arterials should be 50 km/h or less.

If no other type of cycle facility can be provided due to lack of space, cyclists can be allowed use of a **dedicated bus lane** in streets with bus lanes. Advantages include the relatively easy trafficability and avoidance of conflicts between cyclists and passengers at bus stops. Because this leads to new conflicts between cyclists and buses, however, a combined lane is only recommended under certain conditions. The bus lane should either be wide enough (≥ 4,75 m) to allow safe overtaking or narrow enough (≤ 3,50 m) to prevent overtaking [FGSV (2010), p.29]. However, if a bus lane is wider than 4,75 m, narrowing the bus lane and providing a cycle lane should be considered. In addition, a bus lane would fail to serve its purpose (improve reliability of bus service) if high numbers of cyclists impede bus traffic; high numbers of buses also decrease attractiveness and safety for cyclists [Ahrens et al. (2009), p.168 and Deffner et al. (2012), p.105].

Low car volumes and speed limits ≤ 30 km/h on the secondary road network provide good preconditions for cycling. However these cycle routes are often not very visible. **Bicycle streets**, dedicated roads for cyclists, can help to clarify this function and thus lead to a bundling of cycle traffic on these streets, e.g. as part of the main bicycle network. This increases visibility and thus also awareness and safety for cyclists. The speed limit is 30 km/h for all road users. Motorised vehicles may only use the street if permitted with an additional sign. Cyclists are allowed to ride side by side.

Best Practice: Making space for advisory lanes in Berlin

In many German cities, the number of cars on city streets is decreasing, providing opportunities for expanding cycling infrastructure by removing travel lanes for motor vehicles. In Berlin, for example, three different streets were each reduced from two travel lanes per direction to one as part of a noise abatement programme. As a result, an advisory lane was able to be added to the carriageway. Because bottlenecks occur mostly at intersections and not on open road segments, the roads retained turning lanes in the approaches to intersections.

Safety considerations

Two of the main safety issues for cyclists on the carriageway are visibility and clearance distances. Cyclists must be visible to drivers with clear lines of sight between cyclists and motorists. In general, on-carriageway provision allows for good visibility and clear sightlines between cyclists and drivers. A critical situation, however, can arise at intersections due to turning motorists (see Fact Sheet H-04 – Intersections).

Citing the U.K. Department for Transport, Mobile2020 [Deffner et al. (2012), p.72] identifies three factors influencing clearance distance: cyclist stability, passing distance to fixed objects and distance from (and speed of) car traffic. For cyclists on the carriageway, safety clearance to parked cars is especially important due to opening car doors. In addition, it is important to ensure safe passing distances between cyclists and vehicles wishing to overtake. Widths should either be wide enough to allow for safe passing or narrow enough to ensure that passing is discouraged.

Sufficient safety clearance between parking lane and cycle lane (source: Tomas Cach)

Lessons learned: The type of cycling provision depends on many factors, in particular type of connection within the transport network, carriageway width and motor vehicle volumes and speeds. When implementing cycling facilities the two main safety considerations are clearance distances (to parked and moving vehicles, obstacles, etc) and visibility. Other considerations when designing cycling provision include surrounding land use, amount of HGV, street gradient and intersection frequency.

For further resources, links and best practice examples visit the Sustainable Urban Transport Project website: http://www.sutp.org/

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