



## Cycling in Urban Main Streets

### Wide-ranging demands on street space

Main inner-city streets must meet the demands of bicycle and pedestrian traffic as well as cars – through traffic and service transport – and provide for loading areas, parking and bus traffic. The competition for space can be very high, depending on how areas around the streets are used and the width of the street.

This is why some cyclists tend to avoid cramped streets and take less busy side streets. Yet taking such detours is not a satisfactory long-term solution. Many of the destinations of bike traffic are located on main or on main through roads. Main streets must be available to cyclists to ensure the quickest and most direct travel routes. Cycling on main streets is paramount to the well-being of retailers and to creating vibrant city centres.

In view of this, space for cyclists must be made available somewhere among the fast-moving cars and slow-moving pedestrians. Cyclists sometimes have their own path, however, at some point, when traffic converges, they will always cross a section where they have to deal with turning cars. Due to space restrictions mixing bicycle traffic either with automobile or pedestrian traffic is unavoidable in practice. Ensuring interference-free and safe cycling is a challenging planning task which depends on two factors in particular:

- the amount of space available for transport in limited street space;
- driven car speed.

### New state of the art in urban street design for Germany (RASt and ERA)

A few years ago a new generation of technical guidelines and manuals established new planning approaches to street design in Germany. The guidelines were edited by the Road and Transport Research Association (FGSV) in Germany.

Up to now it has been common practice to give sole priority to ensuring optimal flow of car traffic on main streets. The cross section of the street was divided up from the centre of the carriageway, i. e. "from the inside outwards",

*Cover images: Street space reserved for cycling*

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and space was first reserved for vehicular traffic. Pedestrians and cyclists were left with the space remaining on the sides, which is often neither safe nor user-friendly, leaving cyclists with no choice but to ride on pedestrian walkways.

The basic idea behind the basic guideline for street design (RASt 06) is that the new procedural approach to planning practice is executed from the opposite viewpoint, i.e. "from the edge of the road to the middle". The first step here is to reserve ample space for pedestrians on the edge of the road. Bike and vehicular traffic, parking and loading space and designated green spaces are considered to equal degrees so that no single form of transport is fully neglected. If there is not enough space for a separate area for each type of traffic, safe mixed-usage of traffic surfaces is instituted. The guideline recommends first eliminating parking spaces for cars when space is limited – i.e. giving priority to moving, not static, traffic. Particularly in the case of new roads,

it recommends to reshape the street following aesthetic criteria of urban planning e.g. regarding the street's spatial proportions.

The guideline provides an extensive catalogue of suitable cross-section templates based on street width. Four questions must be answered to ascertain the recommended cross section in a step-by-step process:

1. What type of road in the transport network is being planned and what are the main usage demands given development on and near the road? Is heavy pedestrian traffic, a lot of delivery and loading stops and significant or insignificant bike traffic expected?
2. Will bus or tram transport be relevant?
3. How much vehicular traffic can be expected?
4. And finally: How wide is the street space that requires optimal cross-section planning?

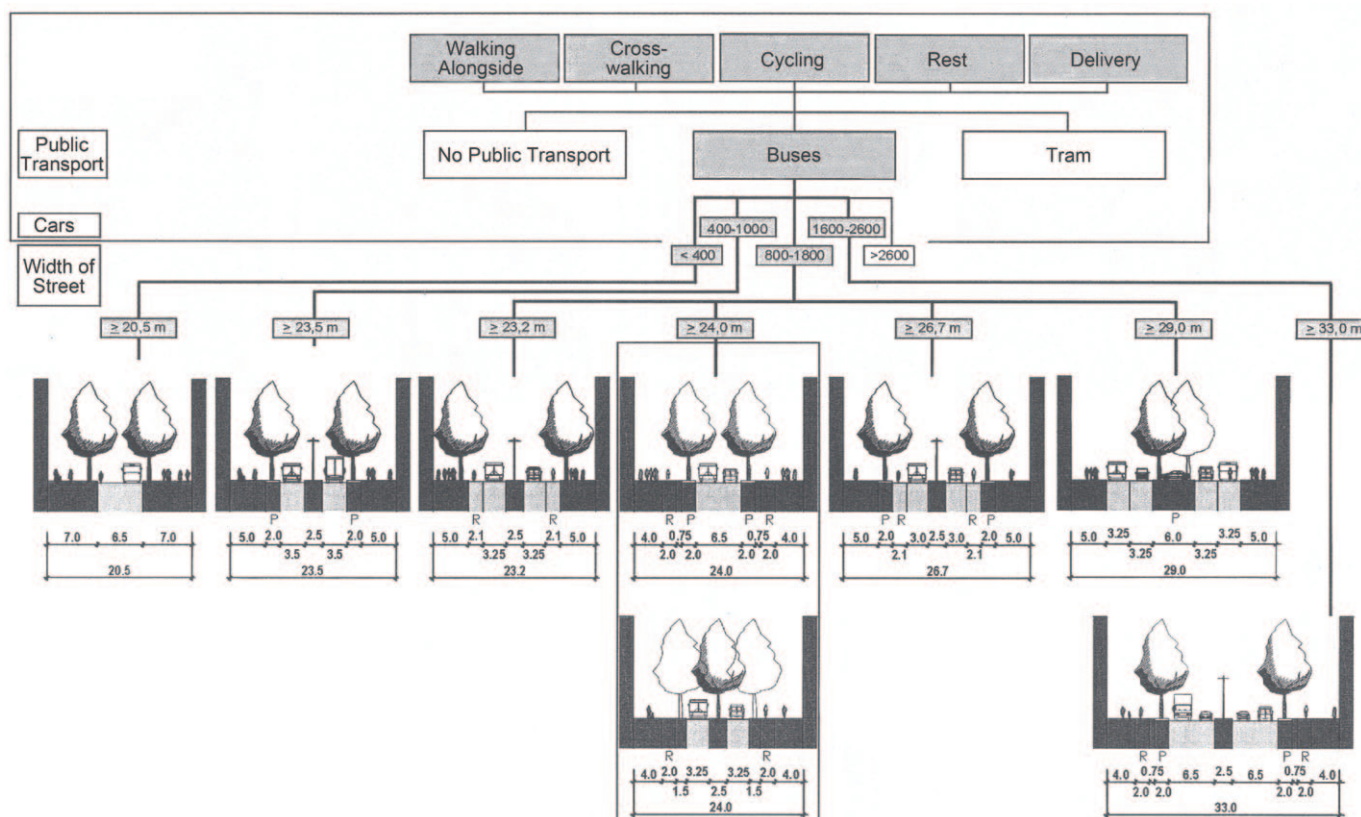


Fig. 1: Ascertaining the best possible street cross-section for all users



## A combination of measures to ensure safe cycling

The ERA Recommendations for Cycling Facilities specify the new state of the art from the RASt regarding cycling infrastructure. ERA records the suitable forms for cycling facilities, i. e. whether to keep cyclists by structural/marked separation or better leave the separation of bicycles out in order to share the space for cyclists and car drivers (see Cycling Expertise No. I-1 on the ERA).

One of the findings is that a carriage width of between six and seven metres does not provide an ample safety area for bikes when being overtaken by cars that are confronted with oncoming traffic. Moreover, cycling is not compatible with mixed traffic on roads with traffic densities of more than 2,200 vehicles an hour.

Bikes are only compatible on the same surface as pedestrians if the pavement is at least 2.5 metres wide and the volume of pedestrian and bike traffic is low. Directing bike traffic onto bus lanes has proven promising on carriageways that are 4.75 metres in width or wider.

An asymmetrical cross-sectional division of the roadway is well suited to inclines and slopes. When travelling uphill cyclists require more space, either on the roadway or on a separate path. When riding downhill cyclists are “carried by the flow of car traffic”.

When cyclists cross the carriageway and find themselves at fast-moving junctions, fast-moving car traffic poses an accident hazard, even if the cyclists are not sharing the roadway. Therefore ensuring cycling safety should start with the overall layout of the streetscape, which can either facilitate safe driving or invite drivers to travel at high speeds.

Traffic islands to facilitate street crossing and allow both pedestrians and cyclists to cross the street in two actions.

There are two traffic situations in which cyclists are prone to particularly serious accidents:

- When continuing to cycle straight at an intersection and colliding with a car that is turning right: Creating optimal visual contact and narrow turning radii are the most effective measures for avoiding accidents.
- When cycling on bike paths on the left side of traffic and colliding with turning cars: In this case either



*Traffic island*

better crossings for cyclists riding on the right side must be created to avoid use of the left-hand cycle path or structural safety measures for left hand cycling should be taken at intersections to drive safely there (more attentive driving, slower speeds).

Intersections – whether roundabouts or traffic light regulated intersections – present an ambitious task for designing the roads for safe cycling (subject of further Cycling Expertise editions in progress). At intersections, the most important task is merging cycle and car traffic at the right place. The best solution is to create a stopping place for cyclists as far forward in relation to the traffic light as possible to allow them to cross the intersection first when the light turns green.

Road Safety Audit methodology was developed to check the quality of the conceptual design on the basis of colleagues' collaboration. In some Länder this is a mandatory step in the planning procedures. The audit is a systematic and informed examination of the safety risks to all users and makes it possible to correct initial planning flaws. Experience shows that a considerable portion of the corrections are matters of cycling traffic management.

## Procedures for quality integration and local acceptance

Redesign of a main road – especially commercial streets – has widespread effects on the appeal of visiting an area and the shopping atmosphere, and on general safety and the state of the environment. Conflicts regarding various planning aims and the needs of the people affected must always be weighed against one another. Well-devised planning

and decision-making procedures are especially important when a new or heavily restructured road is being financed with state funds. In Germany there are two formal ways of doing this:

- Attaining a planning permit from a neutral state office that has had all aspects of the project investigated and has heard the arguments of the institutions affected and those raising objections.
- A planning procedure (development plan) that gives weight to the suggestions and concerns of a large spectrum of the public. Local councils make the final decision on the specific uses of areas around street spaces.

## Outlook: More integration of the modes in the street space?

Especially in view of restricted space conditions, not necessarily each traffic mode can claim its own strip in the street. Intelligently devised mixed-usage transport planning combined with considerate coexistence is being pursued in many cities. This mixed-usage approach (shared space) is founded on eye contact, low car speeds and near total freedom of movement for pedestrians. The principle of coexistence in commercial streets with low and moderate traffic densities (up to approx. 10,000 cars/day) has become a fundamental part of traffic law in Switzerland, where creating shared space has become an established and proven practice. It includes a speed limit of 20 km/h, limited parking on specified spaces and an obligation not to obstruct

fellow traffic participants. Cyclists too enjoy almost unlimited freedom of movement, as all car traffic moves at about the speed of a bike. Current practical experiences in integrated street design following Shared Space principles is becoming theme of a supplemental RASt draft paper.

## Conclusion

The new state of the art for cycling facilities offers more options – most of which have already undergone safety tests – to manage cycling traffic easily and safely, even when neighbouring street space must accommodate several types of usage. The measures go beyond those conceived specifically to address cycling issues. Instead, several elements are employed in a street space concept that integrates all users to create a balance of space for all traffic participants.

## Guidelines

FGSV: RASt 06 – Richtlinien für die Anlage von Stadtstraßen. Köln, 2006

FGSV: ERA – Empfehlungen für Radverkehrsanlagen. Köln, 2010

FGSV: Handreichungen zu Straßenräumen mit hohem Aufenthalts- und Überquerungsbedarf – Shared Space und andere Ansätze. Köln, 2010 (Draft March 2010)



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