

FEASIBILITY STUDY

Radschnellweg Ruhr
RS1

Abstract

RS1
DER SCHNELLSTE WEG
DURCHS REVIER



Gefördert durch:



Bundesministerium
für Verkehr und
digitale Infrastruktur

aufgrund eines Beschlusses
des Deutschen Bundestages



Regionalverband Ruhr

IMPRINT

Promotor:

Ruhr Regional Association (Regionalverband Ruhr)

In cooperation with the following cities:

Duisburg
Mülheim an der Ruhr
Essen
Gelsenkirchen
Bochum
Dortmund
Unna
Kamen
Bergkamen
Hamm
and the district of Unna

Contractor (planning consortium):

Planersocietät – Stadtplanung, Verkehrsplanung, Kommunikation
Planungsbüro DTP – Davids | Terfrüchte + Partner
Planungsbüro VIA eG
orange edge – Stadtplanung und Stadtforschung
tippingpoints GmbH
TCI Röhling Transport Consulting International

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The abstract summarizes the main aspects of the feasibility study.
The long version is available for download at www.rs1.ruhr.

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01 Main results of the feasibility study (executive summary)

The Radschnellweg Ruhr (cycle highway Ruhr) “RS1” is feasible. This is the result of a feasibility study, which defines a track of some 100 kilometers. 1.65 million people live in its catchment area. The track runs from Duisburg via the city centre of Mülheim an der Ruhr, the citycentre and university quarter of Essen, along the southern border of Gelsenkirchen – with a feeder track to its city centre –, via the city centre of Bochum, the university quarter and Kreuzviertel of Dortmund, and via Unna, Kamen and Bergkamen to

the city of Hamm. Important parts of the track run through the central parts of the cities; more than 90 percent of it uses existing streets, paths and traffic lines like former railway tracks and canal bank paths. It becomes clear that a regional track not only needs little space but also offers the opportunity to upgrade existing urban areas.

The RS1 will be an innovative element of a comprehensive mobility strategy and an important component of the bicycle tourism in the

Metropolis Ruhr. The overall benefit of RS1 will be considerably higher than the costs (benefit-cost factor of the target variant: 4.80).

Among others, the highly congested qualified and local road network of the Metropolis Ruhr will be relieved by some 52,000 car trips daily; the road traffic will thus be reduced by up to 400,000 car kilometers daily. 16,600 tons of carbon dioxide will be saved annually which equals the carbon dioxide emissions of about 900 households.



Compacted illustration of typical track sections and examples of RS1-marking elements.

In addition, the RS1 will provide numerous qualitative benefits:

- The land consumption for motor-vehicle infrastructure will be reduced
- The quality of life and amenity values will be improved in the streets
- For non-motorized persons the participation in urban life will be improved
- Car drivers will benefit from the traffic reduction
- Businessmen along the RS1 will benefit

The RS1 matches the technical quality standards of the state North Rhine-Westphalia. In a design manual the feasibility study describes how the RS1 fits into the existing cityscape and may become a milestone on the way of the urban qualification of the Metropolis Ruhr. Including all bridges and extra structures, the costs for constructing and extending the track will add up to 184 million Euros; if calculated by kilometer, these costs are similar to those of corresponding projects in the Netherlands.

In summer 2014, the Regional Association Ruhr (Regionalverband Ruhr - RVR) and the cities involved have presented the RS1 feasibility study to the public. This study defines a cycle highway of 100 kilometers running east-west through the largest conurbation in Germany, widely without any junctions. There are 1.65 million people living in its catchment area.

02 Cause and aim of the feasibility study

The RS1 is to become the first cycle highway in Germany that runs through a metropolitan area. It raises the claim to be an example for further projects by setting national standards for a new mobility culture and being equipped with the highest quality standards. Running east-west through the Ruhr on the main axis of traffic demand, it has the potential to relieve the two congested east-west axes, the A40/B1 motorway and the Duisburg to Hamm railway line. Local and regional bicycle path networks relevant to tourism are connected to the RS1, other cities not located in the immediate vicinity of its track will be connected to it by means of high-capacity urban axes.

To create a significant potential for shifting traffic from the car to the bicycle, bicycle traffic has to be provided throughout with an infrastructure of high quality. This is particularly true for the commuter traffic between cities in which bicycle traffic is currently of minor importance. Due to the high quality of the cycle highway, the travel time by bike can be reduced by one third on the various interurban connections of the Metropolis Ruhr. Given the development of e-mobility and the increasing sales figures of pedelecs, it can be expected that using a bike will remarkably increase for distances of 5 to 15 kilometers in the future.

The feasibility study is an important step on the way to implement the RS1.

Chronicle:

- 2010: Idea to develop a cycle highway through the Ruhr as an element of an innovative regional mobility strategy (in the course of the transportation conference “Mobilität Ruhr” (“Mobility Ruhr”) organized by Wirtschaftsförderung Metropole Ruhr, wmr)
- 2011: Steering committee Ruhr 2030 resolution to pursue the Radschnellweg Ruhr as a Ruhr 2030 lead project
- June 2011: General Assembly resolution to undertake a feasibility study
- July 2011: First inter-municipal steering committee session
- August to December 2011: Development of a concept study
- December 2011: Letter of Intent signed by the local authorities involved, by the Regionalverband Ruhr and by the state North Rhine-Westphalia for a federal traffic ministry (BMVBS) grant application
- September 2012: Funding approval
- October 2012: Commissioning of the feasibility study
- September 2014: Completion and publishing

03 Planning process and participants

The planning consortium comprising the planning offices

- Planersocietät - Stadtplanung, Verkehrsplanung, Kommunikation (Dortmund)
- Planungsbüro DTP Landschaftsarchitekten GmbH (Essen)
- Planungsbüro VIA eG (Cologne)
- orange edge GbR (Hamburg)

has been commissioned to carry out the feasibility study and to develop the design manual. Parallel to the main study and in close coordination with it tippingpoints GmbH (Bonn) and Tinkerbelle GmbH (Berlin) have developed a communication concept for the RS1. In February 2014, a benefit-cost analysis (BCA) for the RS1 has been commissioned to TCI Röhling Transport Consulting International (Waldkirch near Freiburg) and the economy of the project was proven.

The RS1 feasibility study has been developed in cooperation with a variety of stakeholders; a steering working group which, managed by the RVR, met every two months from the end of 2012 and comprises the following participants:

- Regionalverband Ruhr (Regional Association Ruhr)
- Representatives of the local authorities of the cities of Duisburg, Mülheim an der Ruhr, Essen, Gelsenkirchen, Bochum, Dortmund, Unna, Kamen, Bergkamen, Hamm and the district Unna.
- Further regular members of the steering working group are representatives of the following organisations:
 - › Ministerium für Bauen, Wohnen, Stadtentwicklung und Verkehrs des Landes Nordrhein-Westfalen, MBWSV (Ministry for Building, Housing, Urban Development and Traffic of the state North Rhine-Westphalia)
 - › Landesbetrieb Straßenbau Nordrhein-Westfalen, Straßen.NRW (State enterprise roadworks)
 - › NABU – Naturschutzbund Deutschland e.V. (Nature and Biodiversity Conservation Union)
 - › Bund für Umwelt und Naturschutz Deutschland e.V. , BUND (Friends of the Earth Germany)
 - › Allgemeiner Deutscher Fahrrad-Club e.V., ADFC (German Cyclist's Association)
- Jens Stachowitz, moderator and organizer of the national working committee Cycle highways

In further coordination meetings as e.g. with Untere Landschaftsbehörde (Lower Landscape Protection Authority) in Mülheim an der Ruhr, the National Waterways Authority and the representatives of the local authorities west of the river Rhine, in bilateral meetings of the contractors, the local authorities and the RVR and in internal meetings of the planning consortium the foundation of the feasibility study was laid.

04 Elements of the feasibility study

The feasibility study is a detailed RS1 [track planning](#) ensuing from intensive exploratory and coordinating talks with the local authorities as well as from inter-municipal workshops and joint track inspections. In detailed [track profiles](#) the course of the track and the building measures necessary for the construction of the RS1 are described.

The planning of the track is supplemented by the [design manual](#), which comprises innovative and high-quality sketches of principles and design in order to develop an infrastructure which complies with both the urban and landscape areas involved and with the requirements of the German road traffic regulations. Next to the users' demands, the trends in e-mobility and the special needs of the regional settlement structure, the [quality criteria](#) for cycle highways issued by the state North Rhine-Westphalia have been a fundamental pre-condition for developing the design manual. Thus the integration into the urban landscape which is characterized by a high functionality and by an ambitious design could be aligned with the demands of user groups, the spatial and land-use conflicts and a maximum level of traffic safety.

Next to presenting the transport, building and design aspects, the costs are calculated for each section of the track; on this basis and by means of a potential analysis a [benefit-cost analysis](#) has been undertaken. This analysis provides reliability to the feasibility study and – for the first time for a large-scale bicycle traffic project in Germany – presents the overall benefit of the project for the Metropolis Ruhr.

Another element of the feasibility study is the [communication concept](#). The function of this is to develop a strategy, a corporate design and a flexible action plan for the decision-making bodies, for the local and regional actors, for the press as well as for the citizens of the Metropolis Ruhr. Ideally, this communicative timetable of the different project phases can nationwide be adapted to and used for any other cycle highway project.

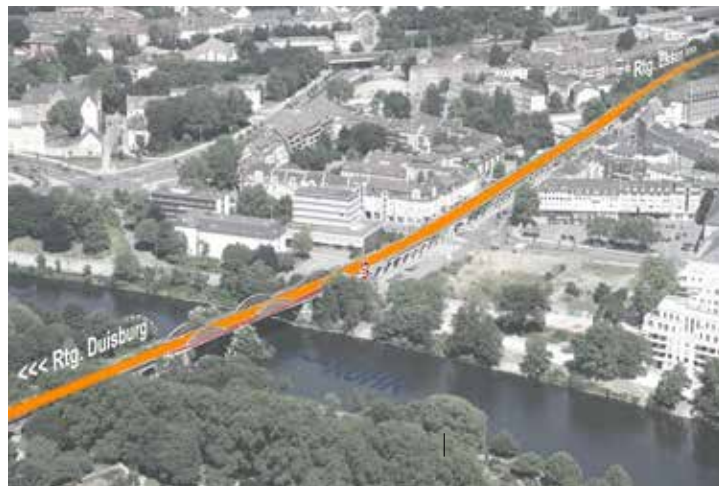
The results of the feasibility study including the planning and design manual, the communication concept and the benefit-cost analysis can give a development impetus to cycle highways, both in North Rhine-Westphalia and nationwide. Furthermore, they allow reliable statements concerning its financial viability and possible sponsoring institutions.

04a Course of the track – from Duisburg to Bochum

The track in Essen is a particularly attractive and important section of the RS1. Along Rheinische Bahn (Rhenish railway line) it connects the Lake Niederfeld, the Krupp belt, the university quarter and the city centre of Essen; there are direct connections to the Gruga park, into the Ruhr valley and to the World Heritage Zollverein Coal Mine Industrial Complex.



In the city of Mülheim an der Ruhr the listed bridge over the Ruhr and the viaduct shape the city-view in particular; the main station is a multimodal node to which the urban development project “Ruhrbania”, the University of Applied Sciences Ruhr West campus, the MÜGA garden exhibition and the RuhrtalRadweg (Ruhr valley bicycle path) will directly be connected.



E

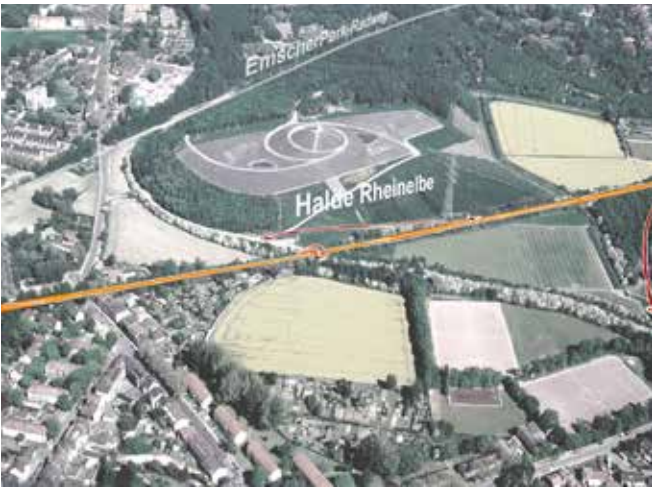
MH

At the beginning the Hochfeld railway bridge links the towns and cities west of the river Rhine to the Radschnellweg Ruhr i.e. the direct urban connection between Duisburg and Hamm. In Duisburg the RS1 follows the track of the Rhenish railway connecting the central station, the university campus and the Dell quarter.

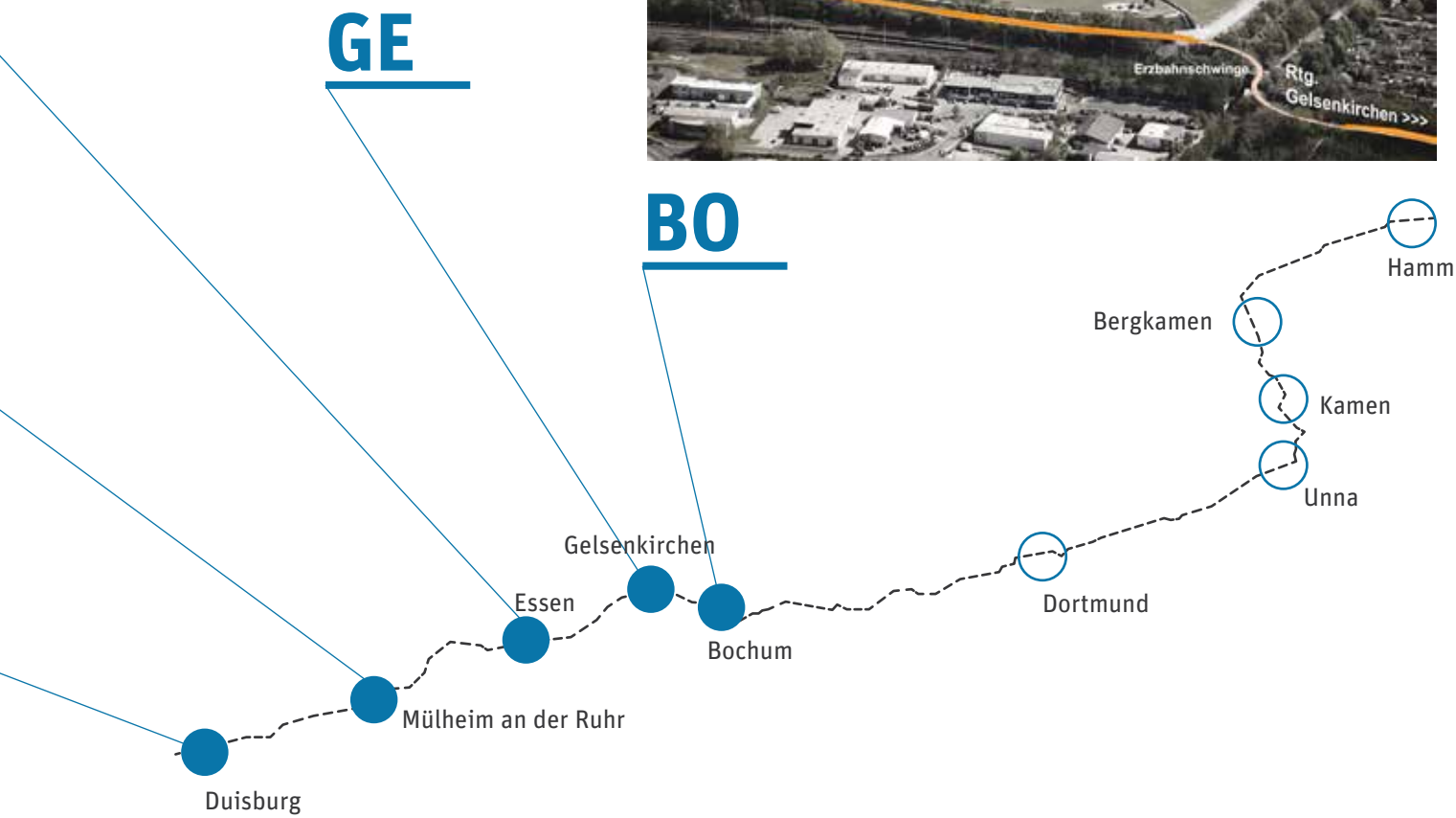


DU

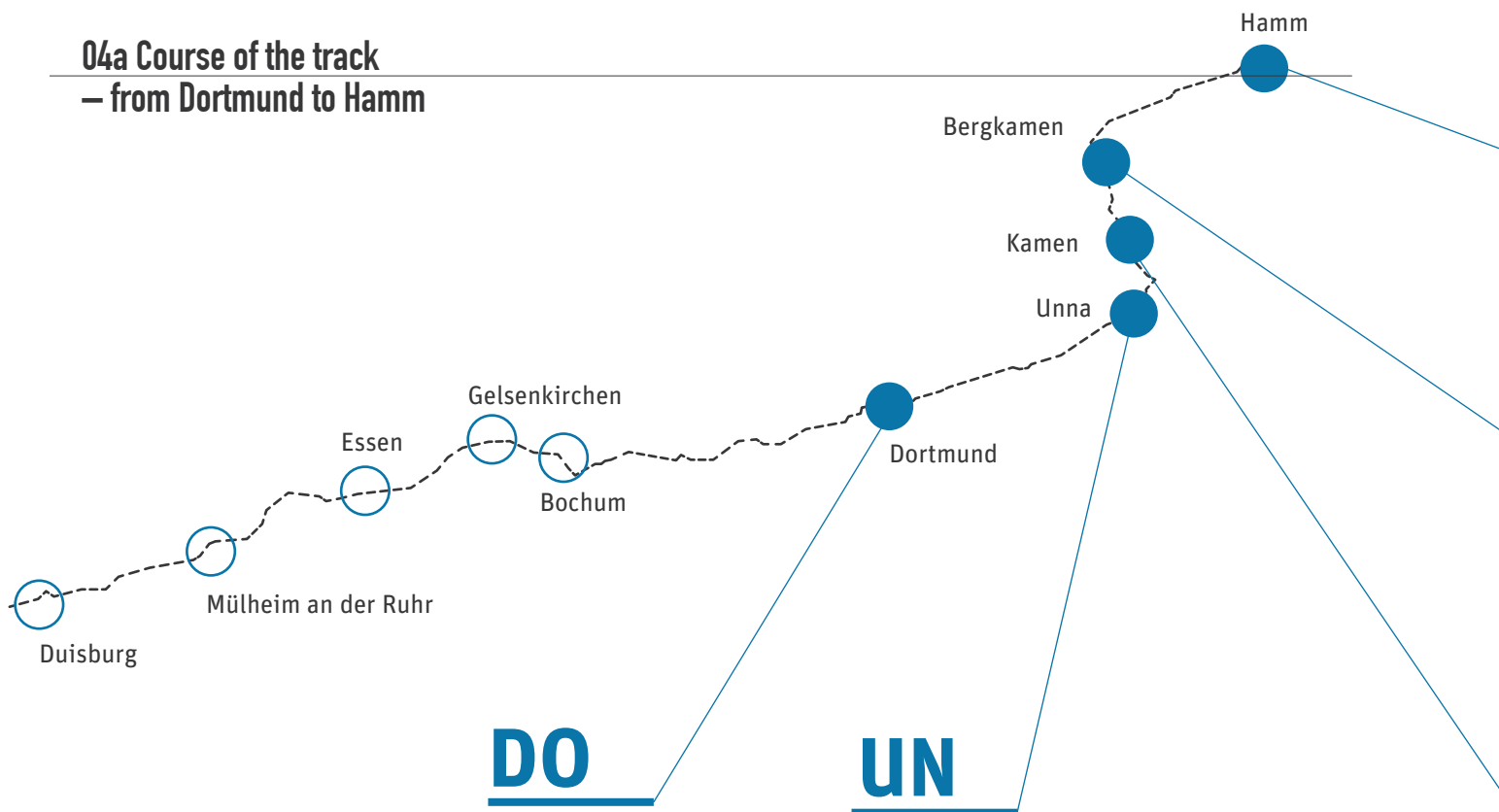
In Gelsenkirchen, the RS1 will be linked to the established high-quality network of the Erzbahntrasse (mine railway), Kray-Wanne rail trail and Zollverein trail, thus providing a quick access to the Gelsenkirchen city centre, to the science park, to the eastern urban districts and further on to Herne.



West of the city centre of Bochum the RS1 track is again influenced by the Rhenish railway track as well as by the West Park, including the Jahrhunderthalle. To the east it runs through the housing quarters between the station Ehrenfeld and the central station; the university campus Bochum is linked by the Universitätsstraße. In the further course, the RS1 is connected to the Springorum bicycle track, and in Langendreer it is linked to the Rheinischer Esel bicycle track leading to Witten.



04a Course of the track – from Dortmund to Hamm



The RS1 links the campus of the Technical University Dortmund and the Kreuzviertel via the Schnettker bridge. The cycle highway will change Stadthaus station into a multimodal node; a direct link to the “garden city bicycle track” is planned. Arterial roads will be crossed by means of bridges, underpasses or bicycle-friendly junctions.



These measures will contribute to develop a high-quality direct connection between Dortmund and Unna, which will be particularly attractive to commuters; at the same time the highly frequented bicycle track between Unna and Kamen will be optimized.

HAM



In its further course, the RS1 will follow the well laid-out canal bank paths to Hamm; a new bicycle bridge links the city centre and the railway station.

KAM



Between Kamen and Bergkamen the RS1 uses the Klöckner rail trail which already today is an important element in the mobility system between the two towns. High-quality tracks as the Seseke track and the Kuhbach track connect the city centre and the adjacent housing quarters to the RS1. Kamen railway station is a particularly important transport node for the commuter traffic. In Bergkamen-Rünthe a new bridge over the Datteln-Hamm canal is being planned.

BK



04b Quality standards

In North Rhine-Westphalia, a professional working group which has also been attended by the RVR developed the quality standards for cycle highways; they were published in 2013. In addition, the Forschungsgesellschaft für Straßen- und Verkehrswesen (FGSV, Road and Transport Research Association) has published a corresponding working paper in 2014. Both papers represent the current state of the art, from which the following basic requirements for the RS1 have been derived.

- The cycle highway default width is 4.00 meters for two-way traffic and 3.00 meters for one-way traffic.
- On cycle highways the pedestrian and bicycle traffic should be separated (4.00 meters plus minimum 2.00 meters)
- If the cycle highway crosses other traffic infrastructure it should be privileged or grade-free crossing should be established, if possible.
- In urban areas cycle highways should be lighted, out of town lighting is desired.
- If possible, cycle highways should be signposted as bicycle roads according to German road traffic regulations.
- Cycle highways should be paved with bitumen; generally, a middle marking and side markings should be applied.
- Because cycle highways have to be laid out in a way that they can be fully used in the rain or when wet as well, regular cleaning and winter clearance have to be provided.
- Service stations providing pumps, picnic areas, canopies and other options.
- A slope gradient of less than 6 percent.
- A direct course mainly without diversions.
- Bottlenecks, i.e. deviations from the quality standards, have to be limited to short sections and to a maximum of 10 percent of the total cycle highway length.

In the course of the RS1 conflicts with other road users (pedestrians, inlineskaters, motorized personal transport) and with conflicting land-uses (railway infrastructure, ecologically important spaces) have to be solved. The quality standards with their safety, legal, ecological and innovative implications aim at and provide a clearly defined frame for the design approaches of cycle highways.

04c Design manual

The design of the cycle highway combines different requirements and functions. It has to stress the RS1 as a new type of infrastructure, has to fulfill the quality standards, has to be adjusted to the surrounding and the needs of places and users and has to minimize usage conflicts. The basic concept has been defined by five design guidelines:

Recognisability: Cycle highways need standard criteria of design, as e.g. a standard sign-posting with a dominant colour and a dominant typography. This requires a corporate design, which is standardized nationwide.

Regional brand: At the same time, geographical references should be recognizable; therefore, the design must be open for regional differences, e.g. for special road markings.

Genius Loci: Urban design has to respect the genius loci, i.e. the building culture of a place; this is particularly true for areas like the Krupp Park in Essen, the West Park in Bochum and the viaduct in Mülheim an der Ruhr.

Flow Design: The design has to consider the drivers' spatial perception e.g. due to different speeds and the resulting effects as reduced attentiveness in monotonous areas or distractions in urban areas; changing view axes, clear sign-posts or dynamic road marking are tools that can be applied.

Acceptance: Combining functional and aesthetic aspects, a well-designed traffic infrastructure is to enrich the space and creates an additional value in urban areas. Well-designed traffic constructions are more easily accepted and better used by the people.

To design the RS1 track six design elements have been defined.

Lane: The road surface should provide a high cycling quality. Generally asphalt is used.

Markings: Road markings will be used as a design element which is striking, communicative, aesthetic, and safety-supporting.

Steles: Next to road-markings and signposts, steles and distance panels will be erected along the RS1 according to the "Instructions for orientation signs for the bicycle traffic in North Rhine-Westphalia" (HBR NRW). Steles and distance panels comply visually with the corporate identity and can thus be identified as part of the RS1.

Light: Lighting is seen as a dynamic element of qualification which should be adapted to the different spatial situations and, at the same time, should stage prominent places.

Picnic areas and service stations: Picnic areas and service stations along the route can enhance the travel comfort. Their standard design will comply with the corporate identity and can be used for the recognition of the RS1. As far as design and size, the stations should fit into their locations.

Digital networks/E-equipment: A basic e-equipment is a medium-term aim; it might include

- A cycle highway app which allows the users to analyze their travels
- Interactive displays in the service stations; by means of tracking the total number of cyclists, the distance travelled and the amount of carbon dioxide saved can be shown
- Wi-Fi hotspots in the service station

Visualisation of the track design



Dortmund – Hohe Straße

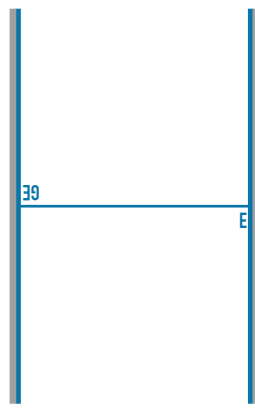


Mülheim an der Ruhr – entry to main station

Examples for track design: Markings



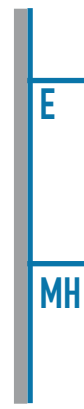
Attention-grabbing usage of lateral markings in front of conflict-zones and as marker for prominent places.



Marker for city-boundary crossing



Marker for long-distance destinations at the wayside

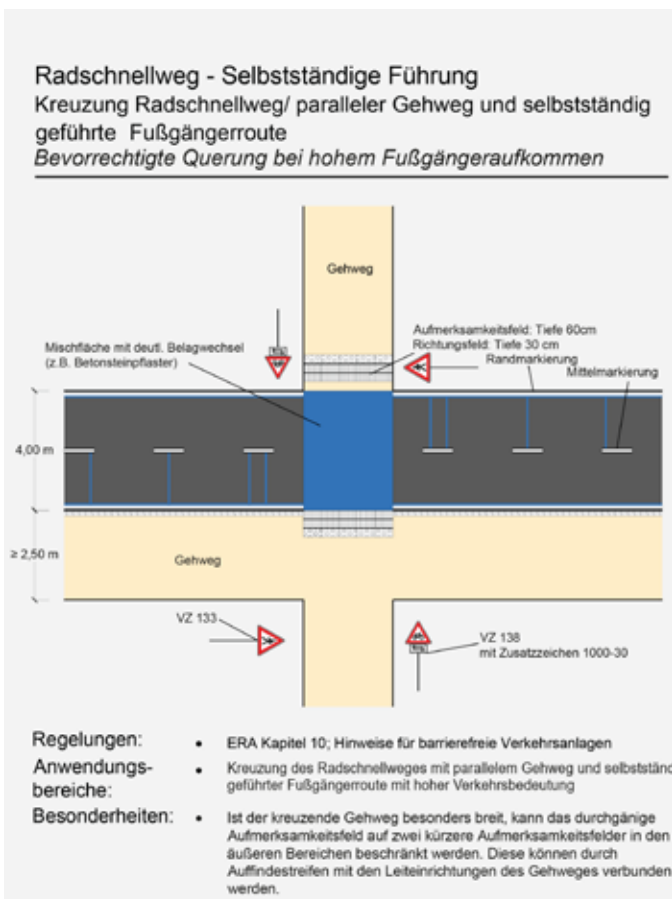
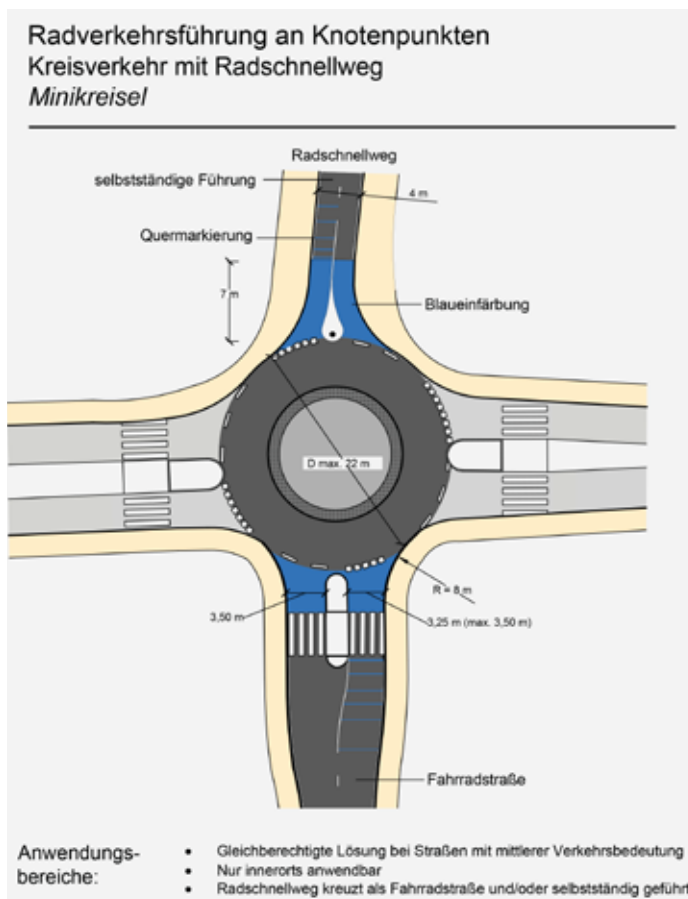
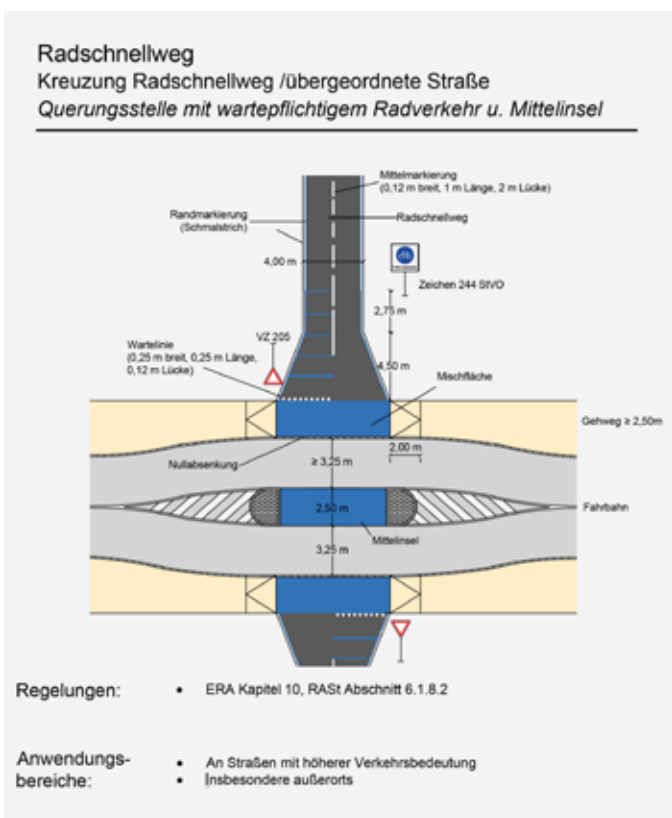
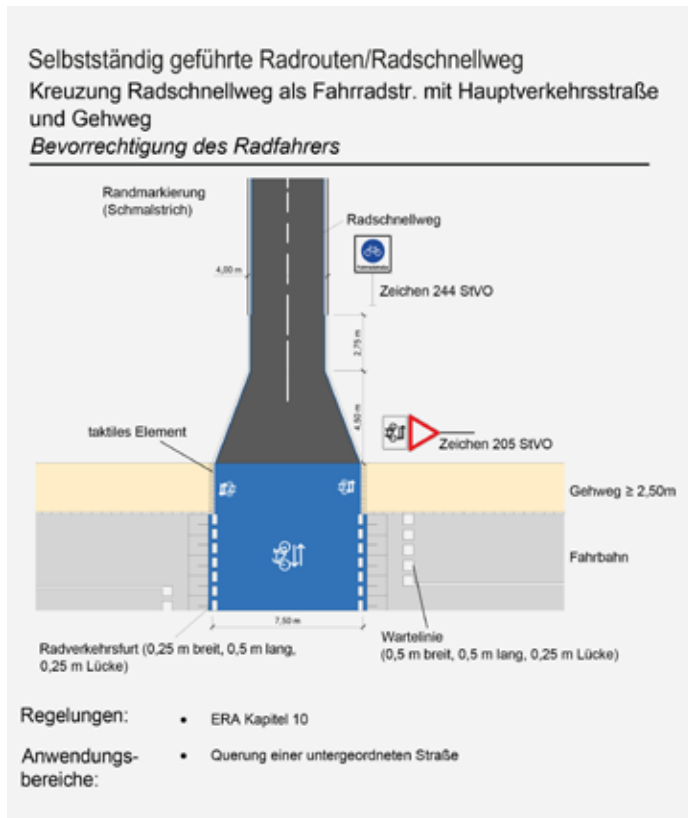


Marker for short-distance destinations at the wayside



Kilometrage at the wayside

Examples of suggested solutions for crossings and nodes



04d Communication concept

Communicating a major project of that heterogeneity is a complex task. The product itself is difficult to grasp yet. Whereas in Essen parts of the former Rhenish railway line track have already been converted and are in use as the RS1, the optimal course of the track is still being discussed in other districts. That is why communication has to support the planning phase on many sites, i.e. a product, which does not exist yet, has to be marketed. On other sites, the problems of the building phase have to be smoothed away by the benefits the finished expressway will provide. And finally, if the expressway will be finished completely or in parts as many people as possible have to be convinced that it is a good idea to use the track for daily travels. That is why the RVR has rightly integrated a communication concept into the feasibility study. Achieving consensus on the pilot character, the necessity and the advantages of the project is the main task. This consensus shall last for years and is for decision-makers, citizens and the press alike, irrespective of their political preferences. At first, the focus is on the regional decision-makers; they get first-hand information, are involved in the project and their function as multiplier of the project is strengthened thereby. In each phase, this concentric communication strategy is to guarantee that the project maintains internal planning strength by a group of competent and authentic multipliers. As soon as the context is defined the main message and features that shall be attributed to the Radschnellweg Ruhr have to be named. Which aspects are so important that they should be put in front of the communication because they convince the target groups? From the central aspects that characterize the cycle highway through the Ruhr the following guiding ideas can be derived:

1. We appeal to the regional pride: The Ruhr – the “Revier” – is again Number One.

- We in the “Revier” are Number One
- Here the future is built and lived
- We are proud of fast cycles in the “Revier”
- In the “Revier” new cycles are rotating

2. We appeal to the pragmatic life-style and the personal benefit. The cycle highway will become the fastest connection in the region. We present a new way of speed which does not stand for “rushing” but for “uncomplicated”, “relaxed” and “congestion-free”. This new way of speed is communicated by imagery:

- The fastest way from Dortmund to Schalke
- The fastest way to your job, your darling ...
- The fastest way through the “Revier”





RS1

DER SCHNELLSTE WEG DURCHS REVIER

The logo emphasizes the positioning of the RS1 as the fastest way through the Ruhr. It is based on a well-known traffic sign illustrating speed and direct connections: the motorway traffic sign. It is alienated by the use of a bicycle and thus communicates the central message at a glance. In connection with the claim “The fastest way through the Revier” the regional affiliation of the RS1 is pointed out.

The fastest way to bypass the traffic jam

One name: RS1. “Radschnellweg Ruhr” is a long, a bit wieldy and mainly a descriptive name. We can assume that abbreviations quickly will become established in the public. That is why right from the start a name that is short and easy to remember has been introduced and communicated: RS1.

- R and S stand for the two most important elements: “Rad” (bicycle) and “Schnell” (fast)
- 1 stands for the fact that the Radschnellweg is the first of its kind in Germany and therefore is unique; it is something the Ruhr can rightly be proud of.

The claim: “The fastest way through the Revier”. The speed, the direct connection, no traffic jams, no traffic lights, these individual benefits lead to the first claim idea: “The fastest way through the Revier”. What are the messages that we want to convey? The RS1 brings benefit to everyone of us. All of us benefit from it:

- The RS1 is a way for everyday ways
- Self-confidence: The RS1 is not simply a bicycle lane but the way through the Revier.

Communication in three steps

The communication of the project has the ambitious task to keep the awareness alive in the public for a longlasting project which is abstract at first (planning phase), then uncomfortable (building phase) and only at the end attractive (completion phase). The communication strategy is therefore divided into three phases:

1. It is your way – planning phase: Informing, participating, adjusting; to talk to the local and national press, to the local and regional politics, to the authorities, to institutions, companies and people; participation of the people leads to a re-adjusting of the planning; citizens involved become multipliers of the project.

2. Build your new way – building phase: Informing, inspiring, moderating; make successes emotionally tangible for the local press, for associations, institutions and residents: continued participation of the residents, events on the construction sites, countdown till completion.

3. More than a bicycle lane – experience phase: Activating, motivating, experiencing; to create opportunities to connect residents, companies and schools; to develop everyday events; the way becomes a stage for events and stories; the way becomes an everyday way which everybody can get personal benefit from.



04e Cost estimate

To estimate the costs the entire track (including some track variants) has been divided into more than 500 sections, widely homogeneous in terms of constructive demands. For these sections the costs have been calculated by summing up more than 50 cost unit rates, as e.g. for road construction, markings or lighting. The cost unit rates have been adjusted to experiences from other RVR projects. The costs for extraordinary constructions as bridges, nodes or underpasses have not been included in the road construction costs but will separately be calculated; costs for planning, taxes and fees have to be added to the construction costs as well. Costs for other services and public relations have not been considered.

The RS1 adds up to 183.7 million Euros; nearly half of the costs are produced by extraordinary constructions such as bridges and underpasses, whereas the road construction itself only amounts to 20 percent of the total costs. These costs are relatively low because wide parts of the RS1 can use already existing infrastructure. The planning costs add up to 10 percent of the total costs. In the highly urbanized metropolitan area the RS1 costs are 1.81 million Euros per kilometer, compared to 0.5-2.0 million Euros for cycle highways in the Netherlands. The high-end costs of the RS1 are mainly due to the large number of extraordinary constructions necessary.

Measures along the track (length/proportion)

New construction: 7,7 km/7,6 %

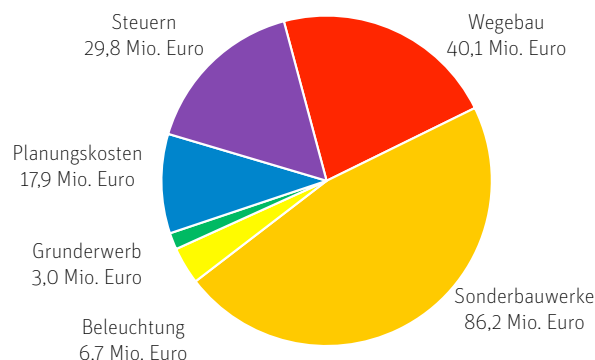
New construction on disused railway: 32,2 km/31,6 %

Reconstruction of roads: 17,6 km/17,3 %

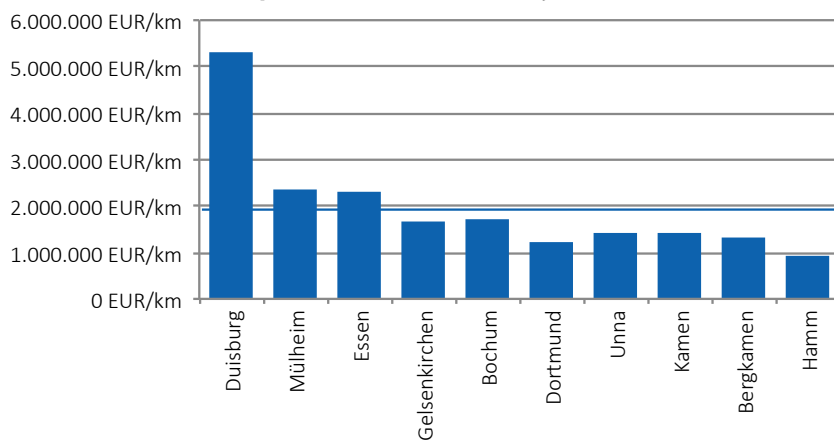
Extension of existing roads: 44,3 km/43,5 %

Overall: 101,8 km

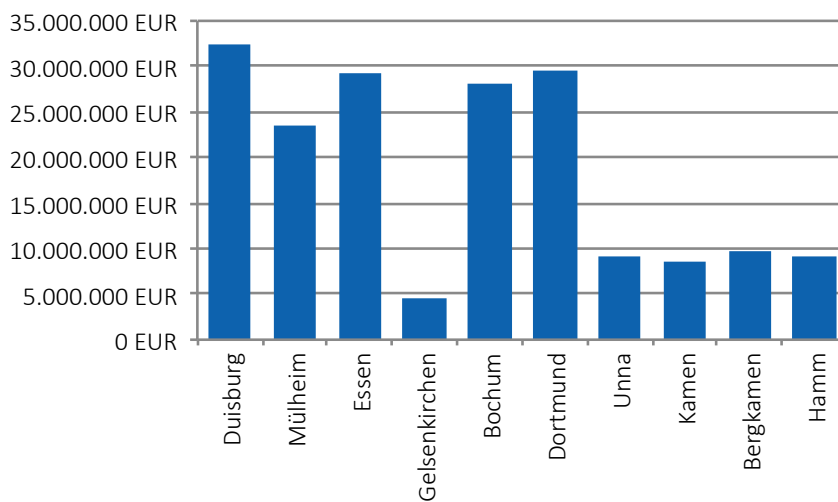
Composition of costs



Costs per kilometer for each city



Overall cost for each city



04f Benefit-cost analysis

The Radschnellweg Ruhr (RS1) is not only an attractive and scenic bicycle traffic connection on the track Duisburg – Mülheim an der Ruhr – Essen – Gelsenkirchen – Bochum – Dortmund – Unna – Kamen – Bergkamen – Hamm, but it exhibits positive overall cost-effectiveness as well. This is the result of the benefit-cost analysis for the RS1. The benefits generated by the RS1 are remarkably higher than the costs. Even though conservative assumptions have been made for the parameters, inputs and transport demands, the BCA still produces a very robust positive result above 1. The robustness has been proved by a sensitivity analysis that varies the inputs and the demand parameters.

Executing a benefit-cost analysis is a prescribed standard for railway and road construction projects. Bicycle traffic planning is tender planning, i.e. bicycle lanes are being planned without taking the demand into consideration. In the course of the feasibility study for the Radschnellweg Ruhr the BCA is a feasibility criterion: A cycle highway with net costs of some 160 million Euros should also exhibit a convincing economic efficiency; it is analyzed by a valuation method that has been developed in the course of a research project to assess the efficiency of bicycle traffic measures.¹

Shifting traffic from the car to the bicycle is an important factor in this evaluation. In the course of the RS1 evaluation this shift has been considered by using detailed estimates of car, public transport and bicycle traffic flows in the catchment area of the Radschnellweg Ruhr. Two demand alternatives have been calculated; being influenced by the RS1, and other supporting measures such as information, public relation activities and public persons using the RS1. In the first variant the modal share of bicycle traffic² rises from 10% to 14% due to the RS1, in the second variant the modal share rises to 20%. As no additional trips are made, these trips are mainly shifted from motorized personal transport to cycling and thereby cause the positive effects. The result is summarized in the following table. It displays the daily trips that are shifted to cycling due to the RS1.

Tägliche Radwege über den RS1, die vom Pkw verlagert werden	Anzahl Wege	Personenkilometer
Planfallvariante V1	22.483	177.719
Planfallvariante V2	52.460	401.122

Shifting for the variants

Linking the trips with the distances results in the parameter passenger-kilometers per day. That is the decisive input for calculating the benefits caused by the RS1 for both variant 1 and 2.

1

Röhling, Wolfgang; Burg, Robert; Schäfer, Tanja; Walther, Christoph: Kosten-Nutzen-Analyse: Bewertung der Effizienz von Radverkehrsmaßnahmen, FoPS Projekt 70.785/2006, im Auftrag des Bundesministerium für Verkehr, Bau und Stadtentwicklung 70.785/2006, im Auftrag des Bundesministerium für Verkehr, Bau und Stadtentwicklung.

2

Calculated as modal share of bicycle, car, regional rail transport and busses. Pedestrian traffic has not been considered.

The economic benefit is determined by partial indicators that measure

- the pollutant emission reduction and
 - the improved road safety due to reduced vehicle trips,
 - the contribution to health care, as e.g. saved expenditures caused by an increase of cycling,
- the reduced consumption of resources.

These benefits are contrasted with the costs which are the construction costs and the maintenance costs. For this comparison the benefits are transformed to monetary units using proper statistics and parameters and referred to a time period of one year.³ In the course of the comparison standard parameters have been used that are being applied in official evaluation processes as well. Summarizing the two alternatives the Radschnellweg Ruhr has been evaluated as follows.

3

The investment costs are transformed to annual payments by taking the service life into account.

Under the given conditions the benefit-cost factor 4.8 proves a clearly positive evaluation of the economic efficiency of the cycle highway. In addition, RS1 produces positive qualitative aspects as well:

Nutzen / Kosten / NKV	Variante 1: 14% Rad	Variante 2: 20% Rad
Nutzenbeiträge pro Jahr	rd. 14,8 Mio Euro	rd. 33,1 Mio Euro
Unterhaltskosten pro Jahr als negative Nutzen	rd. -3,3 Mio Euro	rd. -3,3 Mio Euro
Annuität der Baukosten	rd. 6,2 Mio Euro	rd. 6,2 Mio Euro
Nutzen / Kosten Verhältnis	1,86	4,80

Rating results Radschnellweg Ruhr

- As the RS1 widely re-uses abandoned goods train tracks, their spaces are remarkably upgraded.
- The course of the RS1 significantly raises the quality of life in the various cities.
- New mobility opportunities and destinations are made accessible to
- persons that have no car available.
- Shifting traffic from car to bicycle opens up urban traffic space, it reduces both the risk of traffic jams and the environmental impact and thus causes third party benefits.

To sum up, in terms of an integrated traffic planning that considers the various groups of users, the areas affected and the effects on the traffic infrastructure the implementation of the Radschnellweg Ruhr is evaluated as positive.

05 Further steps

05a Organizing institution and realization of RS1

The RS1 runs through three Regierungsbezirke (administrative regions) of North Rhine-Westphalia, connects various major cities of the Metropolis Ruhr and thereby is, next to its importance as an inner-urban connection between the outer districts and the city centre, of high regional importance within North Rhine-Westphalia. As its track runs parallel to the A40/B1 motorway and will take high shares of the internal regional traffic the RS1 offers a considerable potential to relieve national long distance roads. Construction and maintenance obligations of superior planning levels might be derived due to its function as an interurban connection, its nationwide model character as an innovative traffic infrastructure and its relief potential for federal roads. Therefore it should be discussed with the federal government if and to what extent it will take over the investment costs for cycle highways provided it can be proved that they contribute to relieve federal roads and/or – as is the case with the RS1 – that they have an outstanding model character and can serve as reference to similar projects.

It is the aim to transfer the construction and maintenance costs of the RS1 to the federal government or to the state North Rhine-Westphalia; several stakeholders regard this aim as indispensable; otherwise, the RS1 as a guiding project and a model for further cycle highways cannot be implemented. However, this aim contradicts the existing and constitutionally regulated division of the task-related and financing responsibilities in Germany. A central sponsorship will guarantee both comprehensive and consistent qualities according to the state's criteria for cycle highways as well as the maintenance, cleaning and winter services.

Given the present conditions for bicycle traffic infrastructure grants, the RS1 cost estimate has shown that its implementation is not possible if it has to rely on the RVR and the municipalities of the region alone. The discussions within the project working group, the steering group of the heads of departments, and the policy-makers of the municipalities involved have shown that the equity ratio of the high costs which ensue from the high qualities for constructing and maintaining the cycle highway cannot be financed. Particularly due to the construction of the bridges, tunnels and underpasses, which create a great part of the costs, the local authorities depend on comprehensive financial support. However just these parts of the track are fundamental for the success of a cycle highway, as it is the straight and continuous course of the track that provides the benefits for the users. New modes of grants - e.g. for model projects - have to be created. The allocation

of subsidies should closely be connected to the plausibility of the network, its integration in the local networks, its legal foundation – as e.g. in the Regional Plan – to the qualitative criteria of the cycle highway and to the independent traffic usefulness of the section of the cycle highway which subsidies are applied for.

In the course of revising the Straßen- und Wegegesetz (Road law), it might be conceivable to operate the RS1 under the sponsorship of the state North Rhine-Westphalia which would then provide the means to construct, extend and maintain the cycle highway. The state budget will have to be extended by the item “Construction and maintenance of cycle highways”; in addition, the state government and the local authorities will have to agree on criteria for the terms “urban” and “non-urban” in order to reduce the lengths of the RS1 sections which the local authorities bear the financial obligations for.

It is recommended to establish a joint working group comprising the RVR and representatives of the local, state and federal levels; this group should evaluate the chances of funding considering the different administrative levels and different approaches. The responsibilities for and the financing of the winter services and the traffic sign system should be discussed as well. The building authority has to pay the construction costs, services can be delegated to third party contractors. It is worth discussing as well if, when RS1 has been completed, an operating company shall be established to coordinate the further activities. The RVR could undertake the job if financial means and staff are provided; alternatively, a limited liability company or a co-operative could be founded. The partners could be the RVR, the local authorities and the state enterprise “Straßen.NRW”.

In general, a funding by the federal government is very much appreciated because the RS1 can be regarded as a national and international model and reference project of a cycle highway in a polycentric metropolitan area. With its nationwide and international impact to promote the bicycle traffic infrastructure it requires special and creative solutions of financing.

05b Steps of implementation

The implementation horizon of the RS1 depends on the settling of the questions considering finances and maintenance. It is aspired to complete the RS1 as a continuous expressway by the end of the decade. Until then, separate sections shall be constructed or developed to the quality standards defined. The efforts that are to be taken influence the speed of implementation in the various sections; special constructions, special uses or sections which need a special co-ordination, as e.g. the Duisburg Stadtwald (urban forest), require more efforts and thus effect the time-period of implementing the RS1. Moreover, the sections themselves can be prioritized:

- The higher the number of potential users in a section, the earlier it should be completed.
- Does a good track already exist that merely needs developing, or is there not even an adequate parallel track so that diversions are inevitable as long as the section has not been constructed?
- A cycle highway with high quality standards is not a solitary construction but needs an integration into the urban network.
- Connecting constructions provide high signaling effects and should be erected as early as possible.

The priorities and the efforts necessary may change in the course of implementation, e.g. if solutions for certain track sections prove to be more complex than expected. On the other hand, the RS1 can be an immediate success and, provided there is a good capacity utilization in the sections already implemented and an increasing demand as well, the implementation of various sections could be promoted.

05c Chances and synergies of RS1

The planned RS1 is the first cycle highway crossing a conurbation. Premium standards as a course widely free of intersections, broad lanes in each direction as well as lighting and winter services make it a model of further cycle highway projects in Germany.

But RS1 is not only a way; it will strengthen the central development axis of the Ruhr by connecting the municipalities of the Ruhr for cyclists directly and without diversions. Distances will become shorter, municipalities will move closer together. Commuters will take the benefit when biking relaxed to their jobs instead of being stuck in traffic jams.

But car-drivers will benefit from the RS1 as well. Three quarters of all hours spent in traffic jams are caused by congested roads. An attractive Radschnellweg Ruhr will help – cyclists don't sit in cars; every cyclist relieves sections and nodes susceptible to traffic jams.

Many interfaces between the RS1 and the public transport promote multimodal transport. By connecting city centres and important development sites as e.g. the Dortmund Technology Park and Ruhrbania in Mülheim an der Ruhr, the RS1 is to become a driving force of urban development as well.



www.rs1.ruhr

