



Transdanube.Pearls - Network for Sustainable Mobility along the Danube

<http://www.interreg-danube.eu/approved-projects/transdanube-pearls>

Guideline for bike carriage system Transdanube.Pearls

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More information about Transdanube.Pearls project are available at
www.interreg-danube.eu/approved-projects/transdanube-pearls



Abbreviations

BSS	Bike Sharing Scheme
ECF	European Cyclists' Federation
POI	Point of Interest
PT	Public Transport



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Carriage Systems

Executive summary

The bike carriage systems manual was developed by the Bratislava Self-Governing Region in cooperation with external specialists from the Institute of Spatial Planning. The manual was compiled during June and July 2017.

The purpose of the task was to map the development potential of tourism services using sustainable and environmentally friendly transport.

Part of the document includes examples of good practice from Europe (and the world), which can be applied in the countries of the Danube region. The document also serves as the basis for fourteen international partners of the TRANSDANUBE.PEARLS project, which creates a conceptual framework for the subsequent implementation of specific activities to process their regional development studies.

The manual deals with the issue of bike carriage systems for public. The document consists of several parts: identification of best practice examples within Europe, framework conditions for implementation, identification of target group requirements, overview of the possibilities for implementation, recommendations for implementation, identification of key success factors, suggestions for transnational evaluation of pilot activities and references.



1. Best practice examples from across Europe

Railway transport

Europe

Bicycles can only be transported if this service is offered on the requested train and if this train has sufficient available capacity of spaces for transporting bicycles. When travelling abroad, you can take your bike with you as oversized luggage. Trains with space for transporting oversized luggage are marked with a bicycle symbol. You will attend to a bicycle transported as oversized luggage for the duration of your journey on the train. In this case, it is suitable to sit in the carriage near your bicycle so that you can keep an eye on it. When transferring between trains, you will transfer the bicycle yourself from one train to another.



Source: www.cd.cz

Slovakia

On a rack - simplified transport is available on almost all domestic trains except for InterCity trains in case the capacity is not exceeded. Bicycle has to be hanged on a rack in a coach marked with a bicycle symbol or it has to be placed in area near the front door of the first coach or the rear door of the last coach. It is possible to transport maximum three bikes per person (one ticket for each is needed). **Mobile left-luggage car** – there is possibility to store a bicycle in a separate luggage compartment. After loading, the railway company takes over responsibility for transport of the bicycle.



Source: www.zssk.sk



Public and regional transport

Prague

There are specific options for travelling with a bicycle within the Prague Integrated Transport system using the different types of transport free of charge (in all cases). In the event of increased demand their transportation is excluded. Bicycles (a maximum of two bicycles on each platform) can be transported in the **metro** on each of the first and the last platforms of



Source: www.dpb.cz

the individual carriages with the exception of the train's first platform. Permissible or forbidden boarding is labelled on each door of the train using pictograms. Bicycles can be transported in **trams** only in the allocated sections and in the direction away from the centre, with the exception of on working days between 2 pm and 7 pm. Bicycles may be

transported only in the areas that are designated for the transportation of strollers. Transport of bicycle in **buses** is only available on line number 147, Cyclobus and the Airport Express line, on which it is possible to transport a bicycle that is packed for air transport. Another possibility is to use the **funicular** to Petřín Hill or **ferry**.

Bratislava

Bicycles can be transported by public transport on selected bus, tram and trolleybus vehicles on free days and during working days between 9am-1pm and 6pm-6am. Permissible



Source: www.imhd.sk

boarding is labelled on each door using a pictogram and the ticket fee for one bicycle is € 0.35. There are also two 'cyclobuses' operating between the city centre and tourist locations at the edge of the city. Bicycles are carried on suspended holders on the rear face of the vehicle. One bus takes 7 bikes at once. On regional buses the bicycle transport is possible on free days at scheduled times.



Other cities

In Vienna bicycles can be transported in metro trains at the selected times free of charge. Based on security reasons bicycles cannot be transported in trams or buses. Despite this limitation Vienna has a dense network of metro and railway lines in the city as well as excellent infrastructure of bicycle routes. A nach B (anachb.at) is a very reliable route planner and online map application with various POIs included, where one may search for a route between several points using various types of transport.



Source: www.wien-konkret.at



2. Framework conditions for implementation

Before the discussion about implementing of appropriate bicycle carriage scheme in particular region it is necessary to consider several factors that are described in this chapter.

Exogenous factors

The local climate is an important influencing factor for cycle usage in different seasons. The knowledge of usage curves helps to inform cost-orientated decisions about the implementation of bicycle carriage. In times of the year when usage is lower, the operator could limit the maintenance of some of the facilities.

Endogenous factors

Suitable Rolling Stock

The main question is: how to influence the public procurement when tendering new transport vehicles/carriages friendly to cyclist? Municipality/regional authorities are often owners/co-owners of transport companies or the ones who order the transport services in the public interest – understanding municipal/regional needs. They are often owners/co-owners of public transport authorities dealing with the implementation of integrated transport system. Purchasing of vehicles/carriages friendly to cyclist can encourage the development of tourism. Authorities should have actual and quality data to decide where and how many vehicles/carriages need to be ordered.



3. Requirements of target groups

Politicians, and Planners

The main requirements of this group can be summarized into these areas:

- Improve the 'city image'
- Increase in cycling
- Reduce CO₂ emissions
- Manage (public) transport demand

Operators

Municipalities

- See Politicians and Planners above, plus:
- Financing model (ownership and operation)
- No 'bad news' regarding cycling

Carriers (Transport companies)

- Financing model (ownership and operation)
- Low investment, running, service and administration costs

End users

- Accessibility (both in the stations and outside) - if coaches are not on ground level, providing of ramps is suitable
- Bicycle carriage - enough space for bicycles in a dedicated area with possibility to lock them
- Cycling infrastructure in the city
- Safety
- Reliability
- Affordable ticket prices
- Information system
- Integration with other modes of transport – technical and practical
- Bicycle parking at railway or bus stations



4. Quick-Check of implementation

For successful implementation quick-check of following issues should be conducted:

- tourist attractions (points of interest - POIs) and destination points in particular region/destination;
- existing sustainable mobility services to get to the POIs and to move between them;
- distance to next railway station or bus terminal;
- possibilities to get from the railway station to tourist attractions, tourist services (hotels, restaurants, etc.), other services (e.g. bus services, pick up services);
- state of the cycling route infrastructure;
- possibilities to get information about carriage services (information at the railway station /bus terminal, information stands, press, web page, web application);
- safe cycle parking places, especially at PT stations and bus stops;
- identification of target group (tourist and commuters) and taking into consideration it needs (target group survey);
- sustainable financing (various sources of funding).



5. Recommendations for implementation

Attract attention

Turn bicycle carriage into a win-win situation. Many prejudices can be shifted by arguing in favour of bicycle parking in the right contexts and by presenting decision-makers with good examples:

- If the infrastructure is in place, more people will choose to travel by bicycle.
- If more people go by bicycle rather than by car, congestion in urban zones is reduced.
- People become healthier, and the impact on the environment is lessened.
- If bicycle carriage is done the right way, the flow of traffic through streets and squares will be improved.
- The money invested in bicycle infrastructure will be paid back manifold in the form of savings on health care, planning and environmental budgets.
- A well-organised system of bicycle carriage will improve using of the public transport.

Key services

ECF, in the publication *Bikes and trains: 7 basic services that give cyclists a smile* published in December 2016, has identified 7 main service fields where needs have to be addressed:

1. Bicycle carriage
2. Information
3. Accessibility to platforms
4. Price of tickets
5. Ticket reservation schemes and sales channels
6. Bicycle parking at railway stations
7. Bike-sharing system operated by railway companies

Bicycle carriage

Of all the services offered to cyclists on long distance and international trains, bicycle carriage is the most important one. There are two types of carriage: the transport of bicycles as accompanied luggage or as unaccompanied luggage.



Bicycle transport as accompanied luggage

Bicycle transport as accompanied luggage means that the bicycle travels with the customer. Ideally, there is a specific bicycle compartment where the 'complete' bicycle can be stalled and locked on bicycle racks. Among all European railway companies, Swiss railways SBB are setting the benchmark: On all train categories and services operated by SBB, bicycle carriage is possible. While the number of bicycle places may vary, there are at least 5 racks in each IC train. It is also necessary that the customer travelling with a bicycle has an easy access into the train from the platform level while carrying the bicycle in his/her hands. Modern low-floor regional trains are usually well equipped for this purpose but at least one pair of wide doors should be present also in high-speed and long-distance trains which accept bicycles on board in order to facilitate the loading and unloading.

Austria's ÖBB high-speed Railjet train with a compartment for 5 bicycles. © ÖBB/Eisenberger



Source: <http://www.oebb.at>

It is possible to transport folded or disassembled bicycles in nearly all rail services in Europe although the requirements and conditions do vary (e.g. on Thalys they must fit into a bag or box no bigger than 120 × 90cm). While this is an option for some cyclists and is supported, it should not substitute being able to transport assembled/complete cycles. Folding bikes account for a relatively small amount of the market. A large number of cyclists are not comfortable disassembling and reassembling their cycles and for those that are willing to do this, the disassembled bike becomes an additional piece of (heavy) luggage to be carried. In order to encourage intermodal journeys, it should be made as easy as possible to integrate cycling and rail services.

Bicycle transport as unaccompanied luggage

This final option is when the bicycle does not travel with its owner. This arrangement is often found with night sleeper or couchette trains but is also used by British Eurostar. For the



specific nature of the Eurostar connection (i.e. passport control, security check etc.) it seems to be a logical solution; however, it is quite expensive (25-30 GBP/journey), the number of spaces on each train is limited and the booking procedure is complicated. Usually both complete and disassembled bicycles are accepted by railway companies that offer unaccompanied luggage services.

Eurostar accepts fully-mounted bikes (London St Pancras)

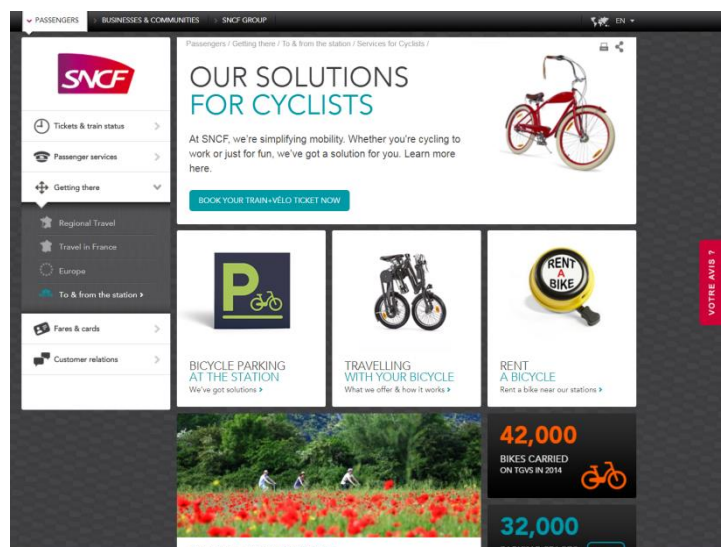


Source: <http://www.cyclinguk.org/news/20151113-ctc-wot-won>

Information

Website of the railway company

A dedicated page on 'terms and conditions' should inform the customer about all relevant aspects of bicycle carriage (i.e. prices, sales channels, differences of the service conditions between national and international trains if any, etc.) and other relevant information. Ideally, this information should be offered in several languages



Source: <http://www.sncf.com/en/services/sncf-velo>



(as a minimum the national language(s) and English).

As long as bicycle carriage of 'complete' bicycles is not the standard, all online timetable search engines should come with a bicycle carriage query function.

Deutsche Bahn clearly sets the benchmark here with the best service to bicycle customers: there is a tick box 'Only show connections that allow carriage of bicycles' on their online timetable search engine. The query function exists for national and international trips alike. Customers can even buy the bicycle ticket online. The online timetable search engine of the Czech national railway company ČD can also be modified so that it only show trains with bicycle carriage but the ticket cannot be purchased online. The Swiss SBB has a similar bicycle query function only for national journeys.

Deutsche Bahn search engine

The screenshot shows the Deutsche Bahn search engine interface with the following elements:

- Outward journey:** Date set to 'Tu, 08.08.17', time set to '11:42'. Radio buttons for 'Dep' (selected) and 'Arr'.
- Return journey:** Option to 'Add return journey' with a 'Time' dropdown and 'Dep'/'Arr' radio buttons.
- Stopover:** 'Add intermediate stops' link.
- Connections:** 'More means of transport' link.
- Options:**
 - prefer fast connections
 - only local transport
 - Duration of transfer: **standard** (dropdown)
- Travellers:**
 - 1 Traveller (dropdown)
 - 1 Adult (dropdown)
 - Without BahnCard (dropdown)
 - 1st class
 - 2nd class
- Carriage of bicycle:** Only show connections that allow carriage of bicycles (buy bicycle ticket if necessary) (info icon)
- Show current alternatives:** Search for alternative connections based on current traffic situation (info icon)
- Buttons:** 'Reset query', 'Seat only (no ticket)', and a red 'Search' button.

Source: <https://reiseauskunft.bahn.de/bin/query.exe/en>



Information within the station

Signage

Within stations (and their surroundings) there should be clear signage, both for people arriving by train or by bike, providing directions to bicycle parking, bike rental or other relevant services.

Signage of a cycle storage at a regional SNCF station (Villefranche sur Saône), France

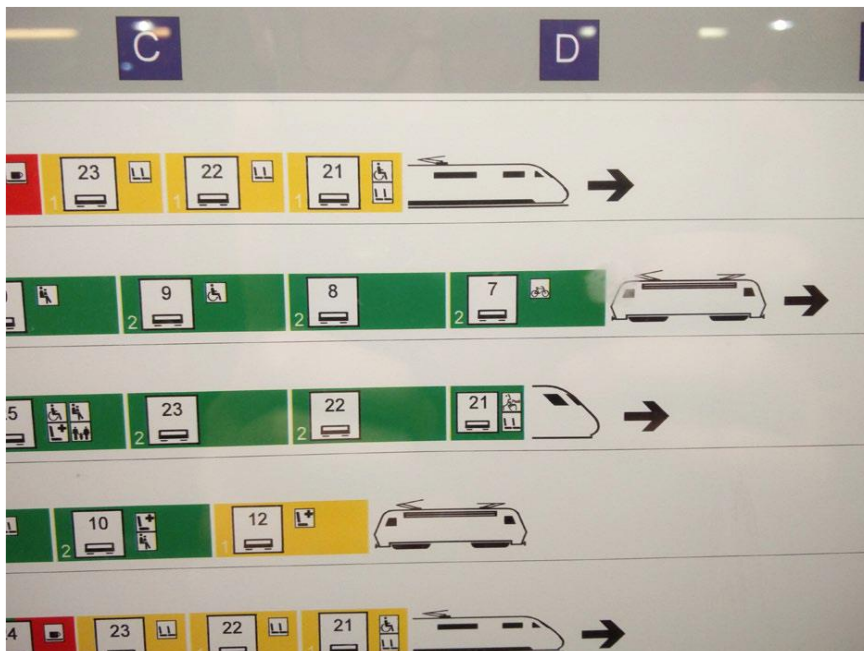


Source: Desmet, 2016

Location on the platform

High-speed trains often stop only for a few minutes. To properly manage the timely loading of bicycles and avoid possible delays, customers need to know which section of the platform their coach is going to halt.

Coach no 7 is offering place for bicycles



Source: Deutsche Bahn

They should be guided by diagrams, either paper (e.g. Deutsche Bahn) or electronic (e.g. SNCF), which clearly indicate where the coaches are going to stop. In addition, platform voice announcements in the local language(s), and preferably also in English, should be given before the arrival of the train. For instance: "The coach for transporting bicycles is coupled in the front section of the train" (ČD).



Information on the rolling stock

The bicycle compartment should be visibly indicated on the rolling stock itself, as shown in the examples below:

SBB-CFF-FFS (Switzerland)



Source: <https://www.sbb.ch/en/travelcards-and-tickets/tickets-for-switzerland/bike-tickets.html>

ZSSK (Slovakia) – long-distance IC train



Source: <http://www.slovakrail.sk>



Accessibility to platforms

It is very important that cycle signs for railway stations are provided on major cycle routes at least within 3 km of the station building. While approaching the station, it should be clear – both in terms of signage and cycling infrastructure – the best way to enter the building and the cycle parking facility. It should be made equally accessible to join major cycle routes when arriving at a destination and exiting a station.

Signage of railway station on cycle route in Hungary



Source of photo: Béla Németh (GySEV-Raaberbahn)

Bicycles, in particular electric ones, can be heavy items for every age group. Even more so if they carry luggage, as it is the case with many cycle tourists. Elevators at busy stations should be a standard facility to help improving access to platforms. At smaller stations where elevators are too expensive to operate, bicycle escalators or bicycle stairways should be provided. In the case of bicycle stairways, there should be enough distance from the railing to be able to leave the luggage on the bicycle.



Price of tickets

Bicycle carriage is a service offered by railway companies to its customers; it is therefore acceptable that the latter pay an adequate fee to the former. However, to reduce the barriers and encourage people to combine bike and train, bicycle tickets should be per journey and not per train.

In our opinion, the cost for a bicycle ticket on a national train should not exceed 10 EUR and the cost for an international bicycle ticket should not exceed 15 EUR. Ideally, frequent travellers can benefit from annual bike passes or multipacks of 1-day bike passes, as it is the case with Swiss SBB/CFF/FSS. For example, Belgian NMBS/SNCB offers a Bike Day Ticket for 8 EUR without any timetable restriction and the same type of ticket also exists in the Netherlands (NS) for 6.10 EUR. Deutsche Bahn's customers who have a BahnCard pay 6 EUR instead of 9 EUR for a bicycle on single long-distance journeys.

There is often a difference between international long-distance and international regional train services. Customers can sometimes find discounted regional one day cross-border tickets (e.g. Labe-Elbe, EURO-NISA-TICKET) offering a very reasonably priced option for transporting a bicycle but this may not always be a convenient option for customers travelling longer distances.

Ticket reservation schemes and sales channels

It should be possible to reserve and buy a bicycle space via the following channels: at the counter, at automatic machines, and online. In the ECF's 1999 paper, 5 different reservation policies were categorised, from A (Best) to E (worst).

- A: reservation is optional, and seats can be reserved near the bicycle
- B: reservation is optional, but there is no provision for reserving seats near the bicycles
- C: reservation is mandatory
- D: reservation is not possible, but there are at least 20 spaces for bicycles
- E: reservation is possible, and there are less than 20 spaces for bicycles

Deutsche Bahn, for example, has a policy whereby a bicycle ticket needs to be purchased at the same time when travelling on IC and CNL (night) trains. This can be done online. The company says on its website the default solution is that the seat and the bicycle space are located in the same coach. SNCF has the same facility too.



Bicycle parking at railway stations

When it comes to bicycle parking at railway stations, the Netherlands is second to none. Two figures illustrate and explain this: 40 % of daily train travellers arrive by bicycle at the railway station and 15 % take the bicycle after arrival to cycle to their destination. Dutch railways NS and ProRail therefore started a programme with the objective to create an additional capacity for bicycles at railway. There are now 444 000 bicycle spaces in Dutch railway stations.

Railway station in Nunspeet, the Netherlands



Source: www.velopa.com/project-solution/station-nunspeet

There are four main different types of bicycle parking in the Netherlands:

- Guarded stations with management
- Automated access system
- Bicycle lockers
- Unguarded parking



Bike-sharing system operated by railway companies

Railway companies should ideally also rent their own bikes for people who do not want or need to use their cycles for all of their journeys.

In the Netherlands, a single chip card ('OV-chipkaart') has been introduced for all public transport systems (train, bus, trams, etc.) across the whole country. This will soon be the only valid public transport ticket for the entire Dutch public transport system. OV-fiets (Public transport-bicycle) can be used with the same card.

If the railway company is not rolling out its own system, integrated ticketing with local bike-sharing providers should ensure door-to-door seamless transport. For example, holders of BahnCards issued by Deutsche Bahn have a 'City ticket' included in their train ticket at their point of destination, allowing them to use public transport for the final trip. This could be expanded to bike-sharing systems.

Call a bike" rental bicycle service provided by Deutsche Bahn (Germany)



Source of photo: PICTURE ALLIANCE/DPA



6. Key success factors from existing good practice examples

Technical requirements for bike carriage

Accessibility (both in the station and outside)

Cycle signs for stations and terminals should be provided on major cycle routes at least within 3 km. On approaching the station, it should be clear – both in terms of signage and cycling infrastructure – the best way either to enter the building or to access the cycle parking facility. It should equally be clear how to access major cycle routes when leaving stations too. Elevators should be a standard facility where there are facilities located at different heights (e.g. to access rail stations platforms) although bicycle escalators or bicycle stairways could be provided as an alternative.

Bicycle carriage

Bicycle carriage of 'complete' bicycles should be possible on all public transport services. There should be a dedicated area or rack where bicycles can be stored safely. Ideally, there should be sufficient space for storing and manoeuvring tandems, recumbents and bike trailers. If coaches are not on ground level, loading and unloading of bicycles is made easier by providing ramps.



Encouraging the use

The main conditions that should be in place to encourage people to combine cycling with public transport are:

Information

Information (online; in the stations; on the vehicles): Public transport company websites should have a dedicated section containing all necessary information related to bicycles (i.e. terms and conditions) and online timetable search engines come with a bicycle carriage query function. Within stations and terminals the location of bike parking and bike rental should be clearly signed. It should also be indicated where customers should go to load their bicycles (supported by announcements) to reduce the possibility of delays. Similarly it should be made clear on the vehicle itself where bicycles should be stored.

Prices and reservation system

Prices of bicycle tickets should be per journey, not per individual service. The cost for a bicycle ticket as accompanied luggage on a national train should not exceed 10 EUR. The cost for an international bicycle ticket as accompanied luggage should not exceed 15 EUR. Ideally, frequent travellers can benefit from annual bike passes, multipacks of 1-day bike passes or other advantageous offers. Whether buying a train ticket from a counter, an automatic machine or online it should be possible to reserve a bicycle space at the same time. Reservation should be optional, and seats can be reserved near the bicycle (if possible).

Bicycle parking and bicycle sharing systems

In larger interchanges bicycles can be stored and accessed at guarded stations with management or with automated access systems, or in bicycle lockers.

For customers not intending to travel with their own bicycle, bicycles can be rented from bike-sharing systems. If the company is not rolling out its own system, integrated ticketing with local bike-sharing providers should ensure door-to-door seamless transport.

Ongoing monitoring

Monitoring both the use and capacity of public transport bicycle parking facilities ensures that parking supply meets demand at particular stations and stops. This can also identify if there are access problems for cyclists attempting to reach the facility. Evaluating and monitoring bicycle carriage on public transport allows for the introduction of policies and



procedures that can encourage multi-modal trips while minimising any disruption to other users.

Train

The specific measures that should be implemented to encourage more cyclists to combine these modes are:

- Ensure that there is suitable infrastructure within station buildings (e.g. lifts, ramps, bicycle escalators etc.);
- Safe and secure bike parking;
- Public bike systems – combined ticketing;
- Clear policy that staff can apply with confidence.

Bus

The growth in long distance and international coach services in recent years has influenced the European cycle tourism market particularly in those areas poorly serviced by the railway network. Bus services offer the advantage of typically being more integrated with cycle routes (e.g. in some cases they share the same infrastructure: public roads).

The specific measures that should be implemented to encourage more cyclists to combine these modes are:

- Bike parking at stations and even stops can attract commuters;
- Consider methods for transporting bicycles (e.g. outside racks are little used in Europe in comparison with North America);
- Clear policy that staff can apply with confidence.



7. References

Web/GIS application

- A nach B (Vienna, Austria): www.anachb.at

Organisations

- European Cycling Federation (Europe): <https://ecf.com>
- Dopravný podnik Bratislava, a.s. (Traffic Company Bratislava): dpb.sk
- Imhd.sk: imhd.sk
- Dopravní podnik hl. m. Prahy: dpp.cz
- Wiener Linien: wienerlinien.at
- Railway Companies:
 - Eurostar – Great Britain - eurostar.com
 - Deutsche Bahn – Germany - bahn.de
 - České dráhy (ČD) – Czech Republic - cd.cz
 - Železničná spoločnosť – Slovakia - zssk.sk, slovakrail.sk
 - SBB/CFF/FSS – Switzerland - sbb.ch
 - NMBS/SNCB – Belgium - belgianrail.be
 - NS and ProRail - The Netherlands – ns.nl, prorail.nl



8. Suggestions for transnational evaluation of pilot activities

Basic indicators

The more indicators of success developing in a positive direction and the more the stakeholders are satisfied, the longer the system will survive. For each aspect a number of relevant indicators are listed. However, not all aspects have natural indicators, and some indicators are applicable to several aspects. It is important to recognise that many of these indicators are ex post, (i.e. measurable only after the implementation of the system). Therefore, they can only be used as guidelines for cities planning to implement the system by comparison with similar cities that have already implemented one.

Table 1 List of possible indicators that may be used for transnational evaluation

Objective	Possible indicators
Improve the 'city image'	Number of positive media articles
Increase in cycling	Change in bike mode share (% points)
Reduce CO ₂ emissions	Number of car trips/total trips replaced
Manage (public) transport demand	Number of PT trips/total trips replaced
No 'bad news'	Number of negative media articles, number of accidents/thefts/cases of vandalism
Low service and administration costs	Service and administration costs/bike
Low investment costs	Annualised investment cost
Low running costs	Running cost
Accessibility	Number of bicycles being transported
Reliability	Cases of full/empty bike carriage (storage) facilities

Source: Optimising Bike Sharing in European Cities, A Handbook, June 2011

Quality criteria

The most important aspects for the survival of bicycle carriage:

1. Information
2. User accessibility
3. Safety
4. Financing model
5. Cycling infrastructure in the city



Overall conclusions

The main purpose of the document is to provide guidance (1) to bodies interested in the development of bike carriage systems from its planning, implementation to operation in cities and municipalities along the whole Danube River (2) as well as to stakeholders, which in cooperation with partners providing public transport services, want to support the development of cycling infrastructure to provide increased comfort of the cycling tourism and transport.



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