

Measure title: **New leisure related mobility service in Krakow**

City: **Krakow**

Project: **CARAVEL**

*Measure
number:*

8.8

A Introduction

A1 Objectives

The main purpose of this measure is to encourage people to use bicycles as regular mean of transport and raise the use of PT for trips to recreational areas, by:

- installing innovative bike carry facilities on 12 buses
- marketing the service (with information brochure)
- testing the system for future use from suburban areas to the city centre
- creating a new model of going outside the city center by bus, not by own car
- improvement of travelling comfort when going by PT buses for bike trips to recreational areas

A2 Description

Car owners often go to the recreational areas outside the city centre using their cars instead of going by bike (due to lack of good bike-paths) or by bus. Often recreational areas are too far away to go by bike. In order to increase the use of PT and alternative means of transport, like bikes for example, MPK has decided to introduce a new service for citizens and tourists by introducing the possibility of travelling by buses with bikes (carried on special bike holders) from the city centre to “green” parts of the agglomeration.

At the beginning of the CARAVEL project it was planned to install innovative bike carrying facilities on 12 buses. This should allow people to arrive at bicycle tour areas around Krakow in a more convenient way. It is expected to achieve a 20% increase of PT use on chosen bus lines in the months of April to October.

The preliminary phase of measure implementation was testing a prototype of bike holder on the regular bus line no 134 – leading to the Zoo in the scope of operating and functionality, evaluating bike users’ sensitivity and recognizing their feelings about bike carry facilities.

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – Riding a bike is a popular way of spending leisure time in Krakow in spring and summer season. Recreational areas where this kind of sport can be practiced are located far away from the city centre. Unfortunately there is a lack of bike lanes linking the city centre to those parts of Krakow’s agglomeration. And that is why cyclists often use cars in order to get there. By introducing the service it is planned to give those people good alternative for driving car and encourage them to use public transport for leisure related activities.

- **Targeting specific user groups** – The implementation of the new leisure related mobility service will allow to target a new group of potential PT clients i.e. bike-bus users. It is also predicted to make families interested in this new kind of services allowing them to get to recreational areas in a more convenient way without the necessity of riding bikes in the middle of the traffic.
- **New physical infrastructure solutions** – In order to launch the new service MPK (leading partner of the measure) planned to construct and test a prototype of bike holder. The bike holder constructed and produced by MPK as well as the way it is installed and operated may be used by other PT operator interested in this kind of service.

B2 Situation before CIVITAS

Before the CIVITAS public transport operator had no offer for cyclists. It was not allowed to transport bikes in PT vehicles because other passengers complained that bikes on-board decreased travelling comfort. Moreover, in order to get to green parts of Krakow people used to take cars since it was the only way to avoid riding bikes in traffic.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Analysis of available solutions

In order to implement the optimal solution in the scope of bicycle grips it was necessary to investigate similar ideas that have already been applied in other European cities. Therefore the analysis of available solutions was the first step of the measure implementation. Subsequently, on the basis of the investigation's results parameters of bike carrying facilities were defined.

Stage 2: Bikes grip prototype construction and testing

The first bike holder was designed and constructed by Retrofitting and Repair Station - a part of MPK's organizational structure. Afterwards the prototype was installed on a bus and tested on line 134 leading to the ZOO. During the tests the following factors were examined: strength of the construction, noise emission, usability, functionality, comfort of travelling by buses with bike carrying facilities, time of bike installation on grips and taking them off, passengers' opinion about the new idea.

Stage 3: Installation of 15 bus carrying facilities

After testing the prototype and compiling technical documentation all 15 bike holders were installed on buses

Stage 4: Determination of service availability area, bus lines selection, preparation of schedules

MPK has determined the service availability area, chosen the bus lines and prepared special schedules.

The following assumptions were made:

- New leisure related mobility service is available in north – western as well as southern parts of Krakow's agglomeration.
- Bus lines from three groups were chosen:
 - Routes on which buses with bike holders will be sent every day,
 - Routes on which buses with bike holders will be sent every working day,
 - Routes on which buses with bike holders will be sent only during weekends and holidays.



B3-1. Public transport bus routes on which buses equipped with bike carrying facilities operate

Stage 5: Preparation of instructions on how to use bike carrying facilities, training and manuals for drivers

In order to ensure a proper and safe use of bike grips MPK prepared special instructions for drivers.

The preparation of the instruction was followed by training sessions which allowed drivers to gain practical skills and consequently a satisfactory level of the new service delivery.

Stage 6: Launching the new leisure related mobility service /bike carrying facilities on buses/ in Krakow

Taking into account the weather conditions in Krakow and seasonal incidence of bike trips to recreational areas it was assumed that new service would be available during the period: beginning of April – end of October, i.e. from spring to autumn. During the remaining time (late autumn – end of winter) bike carrying facilities will be stored and prepared for the next season (preparations will include revision and removal of defects as well as essential maintenance work).

The service was introduced in July 2006 and restarted in spring 2007, after the winter season. The official launch was preceded by the information and promotion campaign that included:

- preparation and publication (in local magazines and newspapers) of maps with routes and lines on which buses with bike grips will operate,
- preparation and distribution (on bus stops) of special schedules with distinguishing marks put down at runs realized by buses with bike holders (for passenger information),
- information on MPK’s website about new service including bus routes and lines on which the service is available (also shown on a special map),
- preparation and production of special stickers to be placed on buses with grips, that promote CIVITAS/CARAVEL project,
- preparation of an article on new service proposed by MPK and publication in local monthly magazine “Miasto Krakow”,

- official grand opening of the service followed by an interview for local TVP3 channel and small press conference including the participation of different media: press radio, regional TVP3 channel

Stage 7: Restart of the service in spring-summer season of 2007 – end of March 2007

2007 was the second year when new leisure related mobility service was available on Krakow. In the period May-August 2007 MPK (the service provider) was monitoring the number of transported bikes on each of chosen bus lines in order to identify most popular direction of bus-bike users' trips.

Stage 8: April 2008 – the beginning of the third season of the service availability

In April 2008 the service started again. Taking into account monitoring results of 2008 as well as requests of bus-bike users the operator decided to include additional bus lines number 100 and 101 into the service scope as well as to enable cyclists to load bikes onto the vehicle and take them down on extra "in-between" stops. Service monitoring activities started again in May 2008.

B4 Deviations from the original plan

None

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure 9.7 *Bicycle renting in Krakow*** – Rented bikes may be transported to green areas by PT buses equipped with bike holders
 - **Measure 11.3 *Sustainable mobility marketing in Krakow.*** – Facilities to carry bikes and promotional action for that service will be used within mobility marketing activities.
 - **Measure 11.7 *Mobility Forum in Krakow*** – It is planned to discuss the service within the Forum
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C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

Table of Indicators

Evaluation Category	N°	Indicator	Units	Source of data	Methodology for indicator construction (survey, modelling, etc)	Baseline date
Own (68)		Bike-bus users	Value	MPK	Measurement	04.2007
CI14		Acceptance level	%	MPK	Survey	04.2007
CI1		Operating revenues	€/pkm	MPK	Measurement	12.2007
CI2		Operating costs	€/pkm	MPK	Measurement	12.2007
CI15		PT accessibility	%	MPK	Survey	04.2007
CI28		Average occupancy	pas/veh	MPK	Measurement	07.2007

Detailed description of the indicator methodologies:

- **Indicator *Bike-bus users*** – it is a number of bike users (cyclist) who took PT bus in order to transport bikes. In order to evaluate the indicator drivers of buses with bike holder will count a number of carried bikes during each bus run.
- **Indicator *Acceptance level*** – it is a percentage of surveyed respondents (heads of Krakow households) who expressed their acceptance for the new leisure related mobility service in Krakow. The indicator will be measured before and after the implementation of the service.
- **Indicator *Operating revenues*** – Since August 2006 MPK- public transport operator has been paid by Public Transport and Road Authority for a number of made vehicle kilometres (based on stipulations included in public service contract with Municipality of Krakow). The amount paid to MPK is not influenced by the number of transported passengers. Therefore in order to evaluate the operating revenues it is assumed that each bike-bus users pays for transport by PT bus the value equal to a price of single way ticket. The operating revenues indicator is defined as a ratio of number of bike-bus users multiplied by single way ticket's price to number of veh/km made by bus with the holder.
- **Indicator *Operating Costs*** – is related to costs incurred for exploitation and maintenance of bike carrying facilities. The source of data is costs registration system for each vehicle with bike holder as well as exploitation results record system. The indicator is defined as a ratio of bike holder's exploitation and maintenance costs to number of veh/km made by buses with bike holders.
- **Indicator *PT accessibility*** – it is a way in which bike users see accessibility of public transport. The indicator will be measured by conducting a survey on bike-bus users. Interviewees will be asked to evaluate the accessibility of the new leisure related service using an interval scale.

- **Indicator *Average occupancy*** – will be based on number of carried bikes counted by drivers during each bus run. It is defined as an average number of bikes –bus users per each bus run of vehicle with bike holder within a certain period of time.

C1.2 Establishing a baseline

Base line data for indicator ***Acceptance level*** were collected during survey conducted in the *time period*: 21st of July – 11th of August 2006.

Sample size: 1210 households in Krakow (Interviewer interviewed only persons who are decision-makers in a particular household)

Sampling method: random stratified selection spanning 18 districts of Krakow

Research method: personal interviews based on questionnaire (paper & pencil method)

The results are included in the section C2.5

C1.3 Building the business-as-usual scenario

If the new leisure related mobility service were not implemented the bicycle tourism would develop on the basis of its own programme. There is a community of bike amateurs in Krakow who realize their own plans regardless external conditions and circumstances. Supportive activities such as mounting of bike racks carried out by different actors in transportation domain might only help to reach the goals by members of the cycling society. Besides, the bike tourism in Krakow agglomeration has been developing on the basis of the policy included in the *Strategy for Tourism Development in Krakow for the period 2006-2013* resolved by the City Council on 5th July 2006.

Moreover, following the decision of the City Council , since July 2008 it is allowed to transport bikes by PT vehicles onboard. In case the occupancy is high bikes inside the bus or tram simply disturb comfortable traveling and might be a reason of complaints from regular passengers. In such situation bike currying facilities seem to be a good solution.

C2 Measure results

The results are presented under sub headings corresponding to the areas used for indicators – economy, energy, environment, society and transport.

C2.1 Economy

Operating costs	Unit cost [PLN/km]	
	Two types of buses within the exploitation period	
Bus Type	July – October 2006	April – October 2007
Jelcz M081MB, Bus numbers: DH376,DH377,DH378,DH379,DH380, DH381,DH382	1,74	1,72
Jelcz M121MB, Bus numbers: DJ677,DJ678,DJ680,DJ681,DJ683,DJ684, DJ685,DJ686	2,62	2,48

Operating revenues	revenues [PLN/km] (from transportation of one bike) within the period May 2007 - August 2007
Bus Type	
Jelcz M081MB, Bus numbers: DH376,DH377,DH378,DH379,DH380,DH381,DH382	0,0010
Jelcz M121MB, Bus numbers: DJ677,DJ678,DJ680,DJ681,DJ683,DJ684,DJ685,DJ686	0,0113

Both economic indicators were evaluated for the first time. The value of the cost indicator is low and has no influence of the total costs of the bus operation.

Furthermore, the indicator “operating revenues” concerns a total number of kilometers made by a bus whereas the service is not used during the thorough operation but only in certain time of the day and the demand depends also on weather.

Generally speaking the new leisure related mobility service is a value added to the PT offer and its reach and use is strongly influenced by a road infrastructure including bike lanes, bike parking, bike rental system etc.

The indicators must be continuously monitored.

C2.2 Energy

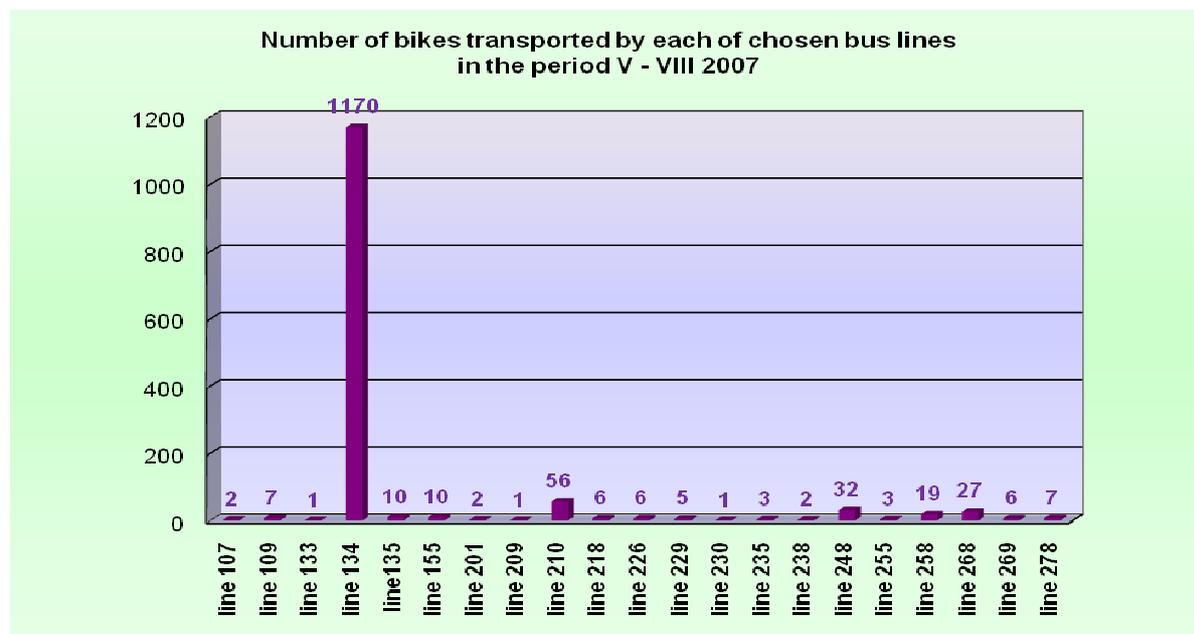
Energy matter is not related to this measurement.

C2.3 Environment

Environment matter is not related to this measurement.

C2.4 Transport

C2.4-1. Bus-bike users in the period May - August 2007



Significant value for line 134 is caused by very popular direction of leisure trips. Line 134 leads to the ZOO, which is placed in hilly part of the city covered by a green area. Other bus lines were not so popular mostly due to the necessity of installing bikes only on first and last stop and proper infrastructure (bike lanes).

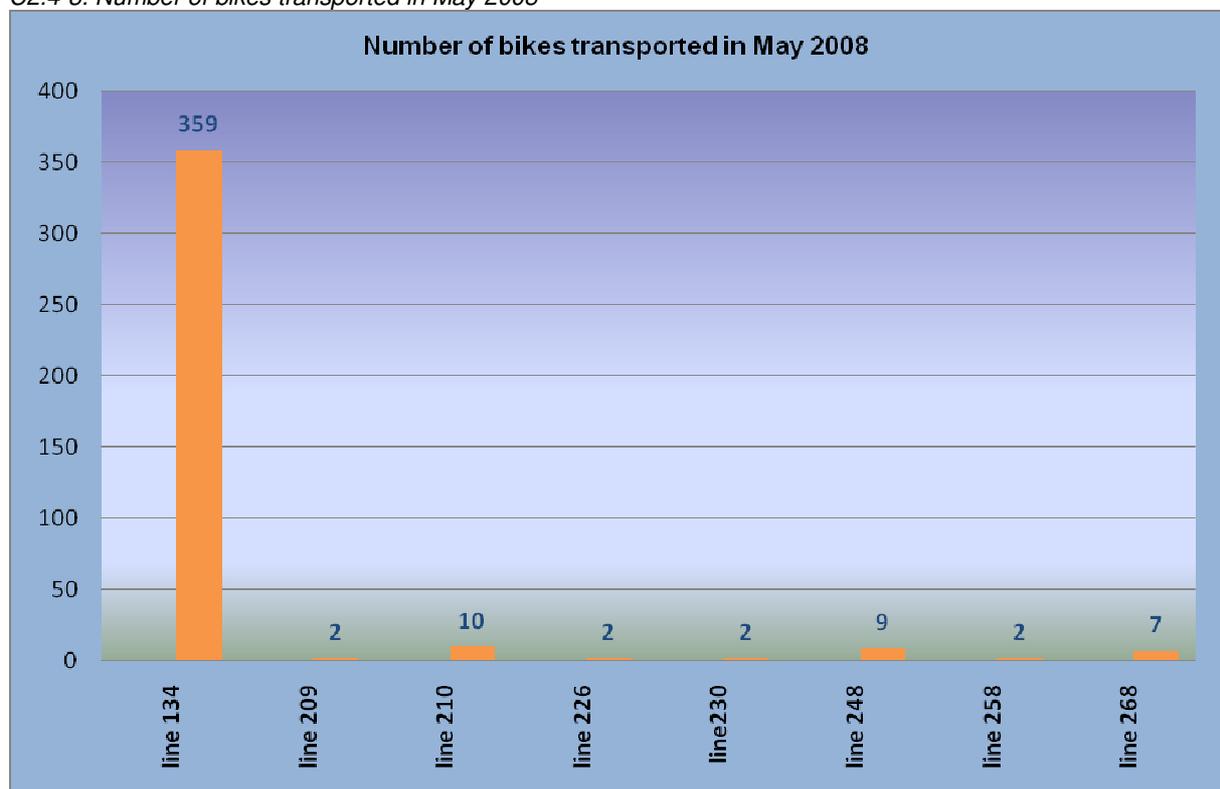
C2.4-2. Average occupancy for line No 134, in period May – August 2007

Month	Number of bus runs			
	Monday -Friday	Saturday	Sundays and holiday	Total
May	1296	384	384	2064
June	1360	400	400	2160
July	1496	320	320	2136
August	1496	320	400	2216
Total	5648	1424	1504	8576
Average occupancy in period May – August 2007, line 134			(1170/8576) 0,14	

The indicator *average occupancy* is very low even for the line number 134 on which bike currying facilities were used most frequently. Such low value might be a result of specific character of the service. In particular bike holders are used in the certain time of a day whereas buses operate whole day. The change of vehicles (from these without racks to those with additional equipment for bikes) during the operation requires additional time and activities to be carried out by the operator's staff. Thus it is less costly and much easier to send vehicles with bike currying facilities for the whole day operation.

Taking into account results of the measurement conducted in 2007, observations made and suggestions from potential clients MPK – PT operator found it necessary to make some changes in the list of bus lines which should be operated by fleet equipped with bike holders in 2008. Some of lines were removed from the list and two new ones were added (number 100 and 101). The results of the measurement of transported bikes repeated in May 2008 were similar to figures achieved in 2007. The line No 134 was again the most popular one among cyclists (*see chart below; lines with value "0" are excluded*).

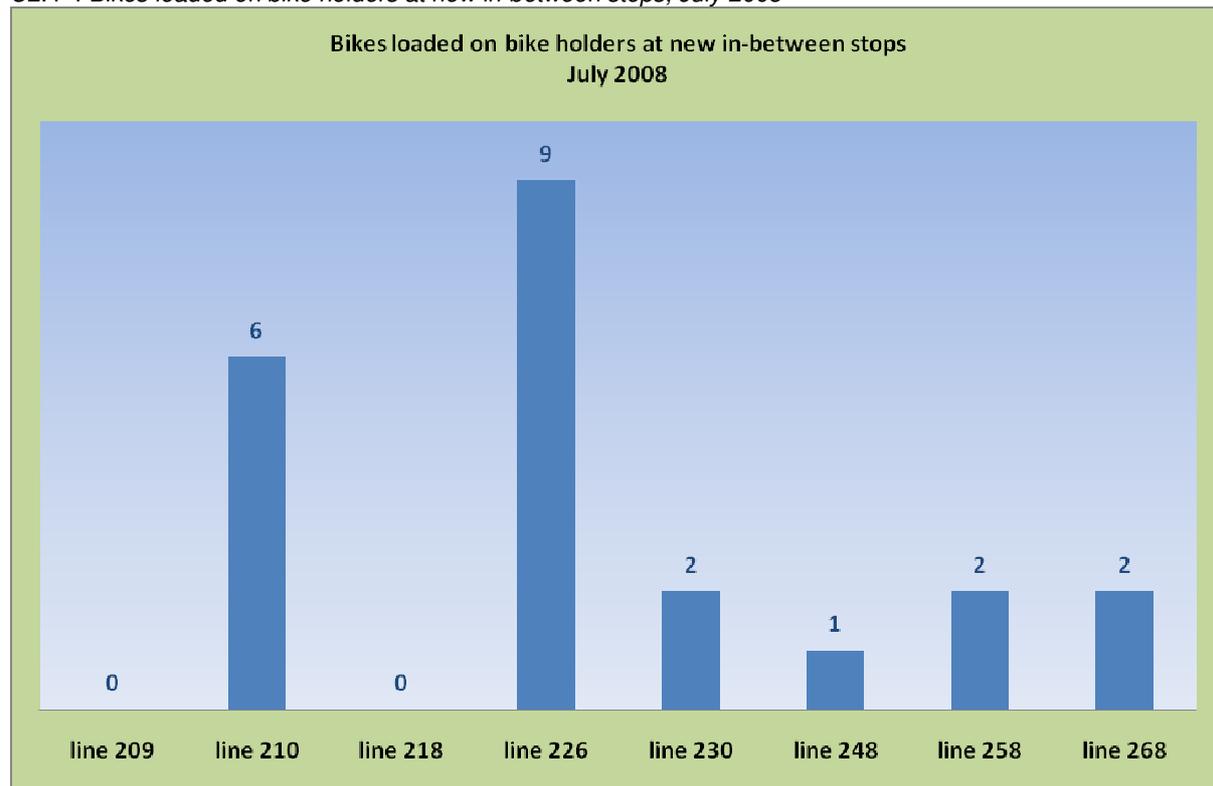
C2.4-3. Number of bikes transported in May 2008



The measurement was not continued in next months due to the enforcement of a new regulation concerning the onboard bike transportation by PT modes which influenced the service performance (see section D1.1 Barriers) and consequently evaluation results.

Furthermore, starting with the new season of 2008 the operator decided to allow bike-bus users to load bikes on vehicles or take them down at so called “in-between” stops in order to make the service more attractive (in last two years it was possible to do so only at the first and final stops). In July 2008 it was observed that “in-between” stops were used by cyclists particularly on lines 210 and 226 (see chart below).

C2.4-4 Bikes loaded on bike holders at new in-between stops, July 2008



C2.5 Society

The level of social acceptance for the new leisure related mobility service was assessed before the implementation by survey carried out in period 21 July - 11 August 2006 (C2.5-1). Within the questionnaire passengers were asked about their acceptance for extending the service in its pilot phase to other lines:

Question: As a part of new leisure related mobility services in Krakow MPK has installed a bike holder on one of the buses which operate on line number 134, leading to the ZOO. Do you think such a service should be also available on other bus routes leading to attractive tourist zones in Krakow or suburban areas?

C2.5-1 Level of acceptance for buses with bike carrying facilities

Level of acceptance for buses with bike carrying facilities		2006	
		amount	%
Yes	980	81,0%	
No	41	3,4%	
Hard to say/ I have no opinion	189	15,6%	
Total	1210	100%	

As the statistics show most of the respondents approved the idea of bicycle carrying facilities on buses.

Next research on social acceptance for the new leisure related mobility service was conducted in summer time of 2007 (during the second season of the service availability). The results of the survey allowed evaluating the number of people who go for bike trips to recreational areas in Krakow agglomeration – ca 30% (C2.5-2).

C2.5-2 Social acceptance, summer 2007

Do you go for bike trips to recreational area in Krakow neighborhood?		2007	
		amount	%
	Yes	389	29.8%
	Not	917	70.2%
	Total	1306	100%

Moreover, those who do not spent their leisure time by riding bicycles would not change their behaviour and habits even if they had possibility to use PT modes in order to get to green areas for bike trips (only 13% would go for such trips; C2.5-3)

C2.5-3 Declaration of use PT with special bike holders, summer 2007

Would you do this kind of leisure activity if it were possible to transport your bike by PT bus equipped with a special bike holder?		2007	
		amount	%
	Yes	119	13.1%
	No	788	86.9%
	Total	907	100%

Furthermore the majority of people interviewed in 2007 (93% - see c.2.5-4) said they had not used the new leisure related mobility service. The survey was not targeted to cyclists but covered a sample of randomly chosen households of Krakow.

C2.5-4 Number of users PT service with special bike holders, summer 2007

Have you used a new PT service that enables to transport bikes on special holders?		2007	
		amount	%
	Yes	86	6.6%
	No	1215	93.4%
	Total	1301	100%

62% of respondents who admitted not to use the service had not heard about it (C2.5-5).

C2.5-5 Awareness of PT service with special bike holders, summer 2007

Have you heard that MPK made it possible to transport bikes on special holders since spring-summer seasons of 2007?		2007	
		amount	%
	Yes	461	38.1%
	No	750	61.9%
	Total	1211	100%

In the summer 2008 the research on representatives of the Krakow households was repeated again. The research method and sample size were also similar (sample of 1347, random route sampling, personal interviews). The results proved the awareness increase among citizens of Krakow. In 2008 46% of respondents admitted they heard about the possibility to transport bikes by PT, which means the 8% raise in comparison with results of the year 2007 (see table C2.5-6).

C2.5-6 Comparison of result from 2007 and 2008, awareness of PT service with special bike holders

Have you heard about the possibility to transport bikes by PT buses on special holders?	2007		2008	
	Amount	%	Amount	%
Yes, I have	461	38.1	621	46.4
No, I haven't	750	61.9	718	53.6
Total	1211	100.0	1339	100.0

During the last research in 2008 Krakow citizens were also asked about opinions regarding some modifications of the leisure related transport service. Although a significant majority of them had no suggestions some of respondents would like to have a possibility of using bike holders on different bus stops, not only on the first and final ones (see table C2.5-7).

C2.5-7 Requests of modification PT service with special bike holders, summer 2008

What modification of the bike transportation system would be useful in your opinion?	2008	
	Amount	%
A possibility to use the bike holder on other stops, not only on the first and final ones.	31	2.4
No modification is needed.	30	2.3
Larger number of buses with bike currying facilities.	23	1.8
Information on how to use the bike holder.	12	0.9
Possibility to transport bike onboard	9	0.7
More lines operated by buses with bike holders.	6	0.5
I am not interested in it.	6	0.5
Bike currying facility on each bike	4	0.3
Tree of charge bike transportation	4	0.3
It is difficult to realize	4	0.3
Better security system	2	0.2
Transportation of bikes by trams	2	0.2
Bigger bike holders	2	0.2
Others	14	0.12
I do not know	1156	89.7
Plenty of answers possible, n=1298		

C3 Achievement of quantifiable targets complete

No.	Target	Rating
1	bike-bus users on the corridor to the recreation area on weekends from April to October	**
2	Social acceptance of the measures and social impact and implications.	**
NA = Not Assessed * = Not achieved ** = Achieved in full *** = Exceeded		

C4 Up-scaling of results

The new service that enables to carry bikes by PT buses on special racks should be realized and expanded within the special programme for cycling development prepared on the City level. The scope of such programme should also include the issue of bike lanes, bike parking spaces, bike rental, bike route signing as well as promotion of bikes as an alternative transport mode.

A bigger amount of bike currying facilities on PT vehicles without any other activities aimed to promote and support cycling will not result in any significant change of bike use level or PT patronage.

C5 Appraisal of evaluation approach

Assessment of quantitative and qualitative indicators allowed to evaluate a performance of the new leisure related mobility service as well as its perception by the citizens. The methodology applied for indicators assessment was appropriate. Almost all evaluation activities were carried out according to the plan. The indicator of awareness level was evaluated additionally. The only problem that occurred during the evaluation process was the enforcement of a new regulation concerning the onboard bike transportation by PT modes which influenced the service performance.

C6 Summary of evaluation results

The key results are as follows:

- The new leisure related mobility service was generally accepted by the citizens of Krakow. Particularly high acceptance level for the new service was recognized at the beginning of the measure implementation.
- The awareness of the bike holders on PT buses was increasing in the following seasons of the service availability. But the service launch did not result in the raise of readiness to use PT transport for the purpose of bike tourism.
- Economy indicators (both operating costs and operating revenues) related to provision of the new leisure related mobility service turn out to have low impact on the overall operation on chosen bus lines.
- The results of evaluation activities proved that bike currying facilities were used most frequently on line number 134 (leading to the ZOO). The most probable reason of such results is that the area of ZOO is very popular among down-hill cyclists, and according to observations made by bus drivers this group of customers is the biggest one on this particular line.

D Lessons learned

D1 Barriers and drivers complete this part please

D1.1 Barriers

- **Organisational risk (O)** - In May 2008 the City Council approved a Resolution nr XLIV/544/08 addressing the rules of the passenger and luggage transportation by PT modes in Krakow. In compliance with the regulations it is allowed to transport bikes by PT vehicles onboard unless there are exceptional circumstances which may prevent from getting in with a bike, such as high occupancy. The rules are binding on all PT lines served by operators who signed a public transport contract with the Public Transport and Road Authority representing Municipality of Krakow and suburban communes which joined the agreement for common realization of local PT tasks. One can expect that these new rules will strongly influence the way bicycle racks are used. Cyclists will probably take an advantage of each situation in order to get onboard with their bikes despite the complaint about worse traveling comfort. Consequently bike currying facilities might become redundant although this solution takes into consideration needs and requirements of both PT customers groups – regular passengers and cyclists.

- **Political risk (P)** – It sometimes happens that politicians (e.g. City Council) make decision regarding the city transport very spontaneously and without previous analysis of the situation or consultation with PT actors. Regulations or rules which are approved under the pressure from some social groups – potential electors can only prevent responsible entities from reaching goals being a part of their strategy or long-term activities.
- **Legal Risks (L)** – An approval of unexpected legal act that would define new technical requirements for mounting external additional devices on traffic vehicles. Such formal documents might force a PT operator to make additional efforts to adjust the existing service to new regulations or to dismount bike currying facilities if necessary.
- **Spatial Risks (S)** – A lack adequate infrastructure for bicycle tourism development will impede further progress of the new leisure related mobility service.

D1.2 Drivers

- Experience of MPK's technical staff as well as disposal of adequate support facilities enabling own production of bike holders.
- Co-operation of local project partners during preparation of marketing campaign for the service.

D2 Participation of stakeholders

- **Citizens of Krakow** – They participated in surveys conducted in 2006, 2007 and 2008.
- **MPK (public transport operator)** – project partner responsible for the measure implementation
- **Members of cyclists associations** – they expressed their opinions about new service and participated in the service launch.

D3 Recommendations

- Basing on our experience it is suggested to include such leisure related mobility service into the cycling and tourism policy developed by the City. The service reach and shape should be strongly related to cycling infrastructure.
- We recommend this way of bike transportation. Special holders on PT vehicles seem to be a good solution which does not cause any disturbances in traveling comfort to regular passengers.
- Transportation of bikes should start at the first and finish at last stop. In particular cases loading and taking off bikes can be done at "in-between" stops. A higher number of "in-between stops" is allowed the bigger are delays in realization of time schedules.
- The bike holder should be constructed in the way that allows for transportation of most popular types of bikes.
- A bus producer should properly adjust a bus to future installation of additional bike currying equipment e.g. the vehicle should have special mountings enabling to fix the bike rack.

D4 Future activities relating to the measure

Due to the new regulation of the bike transportation by PT modes resolved by the City Council in May 2008 (see section D1.1) the leisure related mobility service will be available only on lines with the investigated highest level of the bike holder use. No

further extension of the service is currently assumed unless the regulation is changed.

Since the time the new rules of bike transportation by PT modes are binding PT operator received several complaints from regular passengers on the decrease of travelling comfort caused by bikes onboard. The more dissatisfied customers we have the most probable will be the modification of the rules. 🍌