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POINTER

Measure Evaluation Results

60 – Cycle Transport Improvements in Ústí nad Labem

Deliverable F

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THE CIVITAS INITIATIVE
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Measure title: **Cycle Transport Improvements in Ústí nad Labem**

City: **Ústí nad Labem** *Project:* **Archimedes** *Measure number:* **60**

Executive summary

Although Usti nad Labem has a hilly landscape difficult for cyclists and insufficient cycling facilities and services, the situation is slowly improving and the city is able to significantly increase number of local cyclists by improving its conditions for the cycle transport.

The cycle connection linking the two major cycle routes in the area through the city was designed in order to allow greater use of the existing infrastructure, support tourism, promote local points of interest and enable better utilisation of local services. Implementation of this connection would increase attractiveness of the city as a tourist destination and contribute to intensification and promotion of cycling in the area, primarily as a leisure activity and alternatively for commuting purposes. This fulfils objectives outlined in the Strategy for the Development of Ústí nad Labem for 2015 and the Strategy for Development of Tourism in the Usti Region 2010-2015.

The total investment of the cycle link has been €960,156 (24 358 million CZK). The costs can be partially financed by an appropriate subsidy programme. The management and maintenance will be provided from the city´s own budget. It is anticipated that increased funding for maintenance and repair works of the new cycle infrastructure will not constitute significant burden in terms of resources that have already been allocated. Prior to its implementation, objectives must be sufficiently supported within strategy and planning of the city.

Implementation of the cycle link presents high economic efficiency of the investment. As a project supporting development of cycling, it generates no direct benefits but significant indirect socio-economic benefits resulting from increased length of stay of users in the economic impact area which further contributes to its significant financial efficiency.

Provision of a range of practical information about cycling in the area is being delivered through an integrated web portal, which will be gradually supplemented with up-to-date data. Citizens have been asked to send their comments and feedback to determine what improvements can be made. The cycle web portal provides information about cycling opportunities, cycle services and areas of interest for tourists in the Usti region.

The city further focuses on cycle transport education and safety of cyclists through complementary measures. There are other measures proposed as part of the future transport plans within the city that will to improve cycling conditions, although this may not be the primary objective. These complementary tasks include implementation of designated lanes, calm zones, 30km/h zones and one way roads available for cyclists in both directions. The cycling infrastructure is intended for extension and interconnection to provide a coherent network. Realisation of cycling facilities and equipment is required.

The potential for the development of cycle transport in the city and its surroundings is relatively high. The goal of improvements is to establish cycling not only as a free time recreational activity, but also as an alternative, sustainable means of transport suitable for the city.

A Introduction

A1 Objectives

The measure objectives are:

(A) High level / longer term :

- To increase the share of cyclists in the city transport

(B) Strategic level:

- To improve cycling policy and conditions for cyclists in the city

(C) Measure level:

(1) To provide complex information about cycling opportunities, services and points of interest

(2) To improve cycling infrastructure and provided services

(3) To utilise results of the cycle policy audit performed in the city and implement recommended actions

A2 Description

Based on results of the BYPAD audit realised in the city, Usti nad Labem has adopted as a target the improvement of conditions for cyclists in the city and the surrounding areas and also the creation of suitable facilities for them. This includes two major goals. Firstly, to improve information about cycle transport for the local population by implementing a complex web portal for cyclists in Ústí nad Labem; secondly, to link the existing cycling infrastructure in the area into a coherent cycle network in order to support increase of cyclists in the area.

All proposed improvements to improve conditions for cyclists and encourage greater take-up of cycling in the city have been incorporated into the SUTP of Ústí nad Labem in the form of an Action Plan.

This measure is of regional importance.

It consisted of two main tasks:

- RTD task 11.6.3 Improving Cycle Transport - The feasibility study of connecting the two international cycle routes in the region (Ore Mountain cycle route and Elbe River cycle route) by the new cycling infrastructure leading through the city (please see the Archimedes deliverable R60.1 - Improving Cycle Transport in Ústí nad Labem)
- DEMO task 6.10 Cycle Transport Improvements: Providing complex information about cycling opportunities in the Usti region through the website for cyclists (please see the Archimedes deliverable T60.1 - Cycle Transport Improvements in Ústí nad Labem)

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – Higher priority has been given to cycle policy, which was neglected in the city so far and which was insufficient for the current transport situation in the city.

- **New physical infrastructure solutions** – Several new cycle routes are designed for the city. A cycle link leading through the city and connecting the two major cycle routes in the region was proposed.

- **Targeting specific user groups** – New website application designed to serve cyclists in the area was launched according to the specific needs of cyclists in the city.

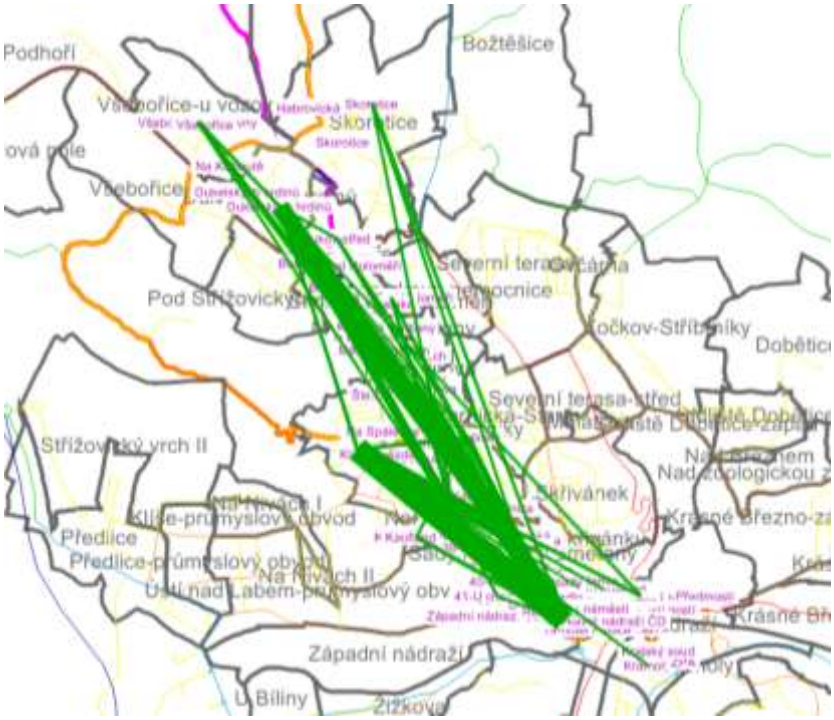
B2 Research and Technology Development

Based on the research, a feasibility study has defined the connection of the two existing major cycle routes of cross-regional importance in the vicinity of Ústí nad Labem (the Ore Mountains Route and the Elbe River Route) . This involved assessment of suitable location of the cycle link in the scenarios – through the existing cycle routes and through new cycle routes, which would have to be established. Both scenarios were compared in terms of financial resources, required modifications, position, accessibility, elevation, surface quality, etc.

Traffic modelling has been used to determine modal split and traffic volumes for proposed variants of leading the cycle route. The volumes of source and destination traffic are set within the zones along the route of cycle track for both variants.

Figure B2.1: Scheme of the traffic model for the variant leading through the already existing routes (the orange line)

Figure B2.2: Scheme of the traffic model leading through the optimised newly designed routes (the purple line)



The implementation plan was designed, proposing to utilise the existing cycle routes leading through the city as a first step, then to gradually construct new suitable cycle routes and redirect the link to this more convenient route. The implementation plan includes description of individual phases (the pre-investment, investment, operating and implementation phase) and calculation of costs, project time table, required actions and designation of responsibilities. It further includes assessment of future usage of the cycle link and a market analysis, impact on the environment and a cost-benefit analysis.

Furthermore, cycling infrastructure was proposed on the existing city road network, connecting primarily:

- Current cycle network
- Cycle routes on both sides of the river Labe
- Cycle routes leading to neighbouring regions
- Towns surrounding Ústí nad Labem with the city centre
- Touristic destinations in the area

These routes are proposed to lead primarily through:

- Existing cycling infrastructure
- Pedestrian and recreation zones
- Segregated lines on roads
- Roads with restricted traffic

Figure B2.3: Proposal for cycle routes in the city centre

In addition to providing suitable facilities for cyclists, improvements were focused on provision of information on cycle transport in the area by launching a new web portal http://cyklomapa.usti-nl.cdsw.cz/ dedicated to cycling in the Usti region. The aim is to promote and support cycling in the area by increasing awareness about cycling opportunities.

The web portal has two basic concepts of map schemes: street maps and photo-orthographic maps. It includes the following features:

- Detailed characteristics of individual cycle routes.
- Safety issues in terms of traffic on the route, description of its surface, warning about narrow sections, steep hills and other safety risks - shown by warning marks on the map, critical points are presented with comments and pictures.
- Quality of the cycling network according to suitability for in-line skating, road bikes, track bikes, mountain bikes or leading the bike on foot (over obstructions etc.) are shown in various colours on the map.
- Videos from each section of the cycle route are shown in both directions. They are recorded by a camera attached to a bike which allows users to view the actual route. Videos are presented in a separate floating window, while the mark on the map indicates the current position on the corresponding cycle route. It is possible to choose the direction the route takes.
- Technical equipment, such as cycle stands, rest areas and services with a corresponding photo gallery.
- Interesting locations in the area - presented with a description text and pictures from the locality.
- Links to other web sites.

Data for the cycle website are still being gathered and the provided information are gradually improved and further updated as the environment for cycling in the city changes. To support safety of cyclists in the city, leaflets with basic safety rules for cyclists were produced in an attractive comic format with rhyming slogans easy to remember. For the purpose of measure evaluation, a mobility survey was performed with city residents.

B3 Situation before CIVITAS

Ústí nad Labem has a difficult orography challenging for cyclists. It is situated in the Elbe river basin surrounded by hills. Moreover, it is provided with insufficient cycling infrastructure and low budget for cycle transport improvements. It has very little road space dedicated to cycling and very low amount of cyclists.

Within the CIVITAS Archimedes project, a BYPAD audit was performed in the city in 2010. The audit concluded that, although the orography of the city and the scarce cycling infrastructure not incorporated into the city's transport system, Usti nad Labem presents considerable potential for development of cycle transport. The Ústí region offers numerous points of interest for cyclists, the city is surrounded by nature trails and cycle routes and it is located between the two major cycle routes of international importance - the Elbe River Route and the Ore Mountains Route.

According to the BYPAD audit, cycle transport improvements in the city demand large efforts and financial resources if they are to be realised. It is therefore necessary to prioritise cycling actions in the city. However, some measures can be implemented without high personal and financial requirements and can be realised within the ordinary operation of the city government.

B4 Actual implementation of the measure

For cyclists in the city, a comprehensive web about local cycle transport was launched at http://cyklomapa.usti-nl.cdsw.cz. It contains interactive maps of available cycle routes and related information about cycling opportunities, services and facilities for cyclists.

In order to connect the two major international cycle routes leading in the region, a new cycle routes leading through Ústí nad Labem was designed in two variants, which were compared in terms of their costs and benefits.

Furthermore, training of school children in safe cycling and traffic rules realised by the Municipal Police of Ústí nad Labem for primary school children was improved.

During public events realised within CIVITAS Archimedes, questionnaires about cycle transport issues and proposals were distributed and public opinion was gathered and processed for measure evaluation.

The measure has been implemented in the following stages:

Stage 1 (April 2009 – September 2009): Survey of cycling conditions in the area, implementation of bicycle policy audit in Ústí nad Labem, mapping current cycling options and provision of services and facilities

Stage 2 (October 2009 – May 2010): Elaborating the feasibility study of implementing new cycling infrastructure connecting the two major cycle routes in the region with Ústí nad Labem

Stage 3 (June 2010 – August 2010): Based on survey results, BYPAD report and consultations with local cyclists, transport experts and municipal employees, conducting an action plan for cycle transport improvements and including findings in the SUTP of Ústí nad Labem

Stage 4 (September 2010 – December 2010): Processing data about cycling in the area into the website application

Stage 5 (October 2010 – January 2011): Producing supporting materials, such as graphical cycling brochures for children, leaflets about the website, promotion in local media

Stage 6 (January 2011): Launch of the website application, providing complex information about cycling in the area online

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure UNL 50 – Mobility Improvements in Ústí nad Labem**: measure focused on development of non-motorised transport in the city, involving cyclists
- **Measure UNL 49 – Road Safety Measures in Ústí nad Labem**: cyclists in the city targeted within the measure, specific solutions increasing safety of cyclists were recommended for the SUTP; training of children in safe cycling and traffic behaviour are part of traffic education encouraged by the measure; graphical training materials with road safety tips for cyclists were produced.
- **Task 11.8.9 – SUTP Development:** recommendations for cycle transport improvements were included in the Sustainable Urban Transport Plan of Ústí nad Labem and processed in the action plan describing individual steps required for implementation.

C Impact Evaluation Findings

C1 Measurement methodology

C1.1 Impacts and Indicators

Table C1.1.1: Indicators.

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Awareness of the policies/measures	Index (%), qualitative, collected, survey
14			Acceptance	Acceptance level	Attitude survey of current acceptance of the measure	Index (%), qualitative, collected, survey
	TRANSPORT					
21		**Transport system**	Traffic levels	Traffic flow by vehicle type	Average daily number of cyclists - season	Cyclist per day, average, season
29		**Transport system**	Modal split	Average modal split - trips	Change in modal split by support of daily cycling	Index (%), quantitative, derived
	ENVIRONMENT					
8		**Pollution**	Emissions	CO2 emissions	CO2 decrease by increase of cycling	Kg per day, season
9		**Pollution**	Emissions	CO emissions	CO decrease by increase of cycling	Kg per day, season
10		**Pollution**	Emissions	NOX emissions	NOX decrease by increase of cycling	Kg per day, season
11		**Pollution**	Emissions	Particulate emissions	Particulate decrease by increase of cycling	Kg per day, season

Table C1.1.2: Detailed description of the indicator methodologies:

NO.	INDICATOR	TARGET VALUE	SOURCE OF DATA AND METHODS	FREQUENCY OF DATA COLLECTION
13	Awareness level	15 %	data from questionnaires distributed during public campaigns and cycling events before and after the launch of the measure (2010 and 2011)	2 x
14	Acceptance level	15 %	data from questionnaires distributed during public campaigns and cycling events before and after the launch of the measure (2010 and 2011)	2 x
21	Traffic flow by vehicle type	10 %	Traffic survey	1 x
29	Average modal split - trips	3 %	Calculated by the traffic model (the module VISEM, simulating traffic behavioural patterns)	1 x
8	CO2 emissions	0,05 %	Calculated by the traffic model (by the environmental module VISUM)	2 x*
9	CO emissions	0,05 %	Calculated by the traffic model (by the environmental module VISUM)	2 x*
10	NOX emissions	0,05 %	Calculated by the traffic model (by the environmental module VISUM)	2 x*
11	Particulate emissions	0,05 %	Calculated by the traffic model (by the environmental module VISUM)	2 x*

*) for each of the two scenarios for leading the cycle route connecting the major cycle routes in the region

Data collection:

Additional source of information: direct observation and recording of events by Municipal employees, BYPAD questionnaire and opinion of the qualified BYPAD auditor, feedback from cyclists through the website.

C1.2 Establishing a Baseline

The baseline for measure evaluation was the state, when there are two major cycle routes of international importance passing the Ústí region, which are not connected with the city. There is only one largely used cycle route in the city leading along the Elbe River. There are only few occasional cyclists in the city, who cycle predominantly in their leisure time. The city lacks connected cycling infrastructure and suitable conditions for cyclists. Provision of services for cyclists is not mapped and there are no systematically organised information available about cycling opportunities in the area.

C1.3 Building the Business-as-Usual scenario

Ústí nad Labem is located in the river basin surrounded by hills and thus the elevation profile of the city is difficult for cyclists. Furthermore, the city has very little road space dedicated to cycling and lacks services for cyclists. There are no dedicated lanes and no priority measures implemented for cyclists in the city. There is one major separated cycle route leading along the Elbe River. Other city cycle routes lead through motor traffic roads. Insufficient cycling infrastructure together with intensive motor traffic in the city results in a very low amount of cyclists. With no efforts for improvements, cycle transport will remain at significantly low level (below 1% of trips in the city overall modal split) and cycling will be only a leisure time activity realised on designated touristic cycle routes passing the region and leading cyclists away from the city.

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

No indicators.

Within the measure, the market and financial analysis of implementing the new cycle route leading through Ústí nad Labem was conducted, including assessment of its costs and benefits.

The costs of the measure involve investments of implementing additional cycling infrastructure connecting the Elbe River cycle route and Ore Mountain cycle route with the city and its operating costs. Investment costs are split across four years according to the planned implementation schedule. The benefits present increase of cyclists and tourism and resulting positive economic impacts. Costs and benefits were assessed for the period of 30 years. As a result, the Net Present Value and the Internal Rate of Return are of positive values. The resulting Benefit Cost Ratio is greater than 1, which indicates an economically viable solution.

For more details, please see the Archimedes deliverable R60.1 - Improving Cycle Transport in Ústí nad Labem.

C2.2 Energy

No indicators.

C2.3 Environment

Exhausted emissions were calculated at all nodes of the traffic model, where both the source and destination traffic in areas along the proposed cycle route was not zero. The calculated emissions consider only changes in the number of personal motor vehicles. Freight vehicles and public transport vehicles remain at the same level.

Pollution of emissions from road transport was calculated by a specialised environmental module of the software VISUM, based on emission factors of the Swiss Federal Office for the Environment.

The traffic model was only capable to generate data for the four following pollutants:

- NOx (nitrogen oxides)
- CO (carbon monoxide)
- HC (hydrocarbons)
- SO2 (sulfur dioxide)

Calculation for each pollutant is made by a regression curve. For the state "before", the level of emissions from personal vehicles is the following:

Table C2.3.1: Pollutants in the state before

BEFORE	EMISSIONS [kg/24h]			
POLLUTANTS	**NOx**	**SO_2**	**CO**	**HC**
Cycle route leading through the existing routes	8,51	1,28	29,98	3,85
Cycle route leading through the proposed routes	8,34	1,27	29,85	3,83

The state AFTER considers decrease of traffic realised by personal vehicles. The traffic volume was calculated to decrease by 9,375 % of cars. It was assumed that the change of volume of motorized transport is in direct proportion with emissions produced by this transport mode. Production of emissions from traffic in the city would thus decrease also by 9,375 %.

Table C2.3.2: Pollutants in the state after

AFTER	EMISSIONS [kg/24h]			
POLLUTANTS	**NOx**	**SO_2**	**CO**	**HC**
Cycle route leading through the existing routes	7,71	1,16	27,17	3,49
Difference AFTER - BEFORE	**-0,80**	**-0,12**	**-2,81**	**-0,36**
Cycle route leading through the proposed routes	7,56	1,15	27,05	3,47
Difference AFTER - BEFORE	**-0,78**	**-0,12**	**-2,80**	**-0,36**

The scenario B-a-U, considering no realisation of the cycle route, was simulated as the state BEFORE.

Table C.2.3.3 – Comparison of indicators on emissions in the city

INDICATOR	Before (2011)	B-a-U (2011)	After (2011)	Difference After –Before	Difference After – B-a-U
no. 8 - CO_2 emissions	-	-	-	-	-
no. 9 - CO emissions	29,85 kg/24h	29,85 kg/24h	27,05 kg/24h	-2,80 kg/24h (-9,375 %)	-2,80 kg/24h (-9,375 %)
no. 10 - NO_X emissions	8,34 kg/24h	8,34 kg/24h	7,56 kg/24h	-0,78 kg/24h (-9,375 %)	-0,78 kg/24h (-9,375 %)
no. 11 - Particulate emissions	-	-	-	-	-

C2.4 Transport

Traffic intensities and emissions produced by current transport (the values BEFORE) were established by traffic modelling (see C2.3). The traffic model is limited by the ability to work only with the following vehicles categories – cars, light freight vehicles (LFV), heavy freight vehicles (HFV) and public transport (PT). The volume of cyclists could not be determined by the model and, furthermore, traffic censuses realised in the city did not include cyclists.

In the current state, cycling in Ústí nad Labem is not commonly established as a regular mode of transport and is rather used as a leisure activity for trips outside the city. According to the field survey performed within CIVITAS Archimedes, cyclists in the existing conditions cover in the urban traffic less than 1% of the modal shift.

Due to the fact, the a time of realization of the proposed cycle route connecting the existing cycle routes in the region is not defined, the values for the foreseen state AFTER was simulated with current intensity values (year 2011) of the existing traffic. The scenario B-a-U equals to scenario AFTER.

A survey of public opinion on cycle transport opportunities, willingness to cycle regularly and satisfaction with conditions for cycling was performed via questionnaires distributed to local pedestrians and cyclists during public events and through the city website (see indicator no. 14).

Based on the survey, it was revealed that:

- 25% of respondents would cycle regularly if the conditions were improved:
    - It was estimated, that these respondents would change their mode of transport from a personal vehicle to a bicycle in half of their trips (12,5 %)
- 25% of respondents would cycle more if the conditions were improved (but not regularly)
    - It was estimated, that these respondents would change their mode of transport from a personal vehicle to a bicycle in quarter of their trips (6,25 %)

A modal change from a freight vehicle to a bicycle was not considered as realistic.

Altogether, it was assumed that the share of road users willing to change their mode of regular transport from individual or public transport to cycle transport would be 12,5 % + 6,25 % = 18,75 % of all transport users.

Although reduction of PT passengers is not desirable, it was assumed, that the shift from public transport to cycle transport would be at the same level as in case of individual motor transport (i.e. 18,75 % / 2 = 9,375 % for each mode). The overview of modal shift changes is presented in the following table:

Table C2.4.1: Foreseen difference in modal split in the city before and after the implementation

	Cars	LFV	HFV	PT	Cycling
BEFORE	100 %	100 %	100 %	100 %	0%
Modal change	- 9,375 %	0 %	0 %	- 9,375 %	+ 18,75 %
AFTER	90,625 %	100 %	100 %	90,625 %	18,75 %

Traffic flow by vehicle type (no. 21)

Traffic volume of source and destination traffic along the new cycle route was simulated by traffic modelling for traffic intensities of the year 2011.

Table C2.4.2: Traffic intensities for two proposed variants of the new cycle route

BEFORE	Cars [veh/24h]	LFV [veh/24h]	HFV [veh/24h]	PT [persons/24h]
Cycle route leading through the existing routes	14 034	651	7	15 624
Cycle route leading through the proposed routes	14 909	701	19	17 591

In case of implementing the cycle route connecting the existing major cycle routes leading through the region, it is expected that the volume of individual cars will decrease by 9,375 %, due to the modal shift towards cycling, and the number of PT passengers will also drop by 9,375 %, but the total volume of vehicles operating on the route is estimated to remain at the same level because the decrease in the transport demand is not significant. Also, cycle transport improvements will not affect freight transport volumes.

Table C2.4.3: Comparison of traffic intensities before and after the implementation

AFTER	Cars [veh/24h]	LFV [veh/24h]	HFV [veh/24h]	PT [persons/24h]
Cycle route leading through the existing routes	12 718	651	7	15624
Difference AFTER - BEFORE	**- 1 315**	**0,00**	**0,00**	**0,00**
Cycle route leading through the proposed routes	13 511	701	19	17591
Difference AFTER - BEFORE	**- 1 398**	**0,00**	**0,00**	**0,00**

It was revealed, that the cycle route is more effective if implemented on the new optimised route rather than leading it through the existing routes in the city. Comparison of variants, market analysis and assessment of costs and benefits are presented in the deliverable R60.1.

Further evaluation deals with the variant leading through the newly proposed cycle routes.

The scenario B-a-U considering no implementation of the cycle route is estimated as equal to the state BEFORE.

Average modal split – trips (no. 29)

The change of modal split was assessed as a change of proportion between motorized and non-motorized transport. Due to the fact, that current data about the number of cyclists in the city is not available and the traffic model is not able to simulate the traffic flow of cyclists, the change was expressed as a percentage ratio instead of absolute numbers. It is considered that the growth of journeys realised by cycle transport will be 18,75 % and thus the motor transport will decrease by 100 – 18,75 = 81,25 %.

Table C.2.4.4: Overview of indicator values before and after the implementation

Indicator	Before (2011)	B-a-U (2011)	After (2011)	Difference: After –Before	Difference: After – B-a-U
no. 21 - Traffic flow per vehicle type*	14 909 veh/24h	14 909 veh/24h	13 511 veh/24h	-1 398 veh/24h **(-9,375%)**	-1 398 veh/24h **(-9,375%)**
no. 29 - Average modal split	Motor transport 100% Cycle transport 0%	Motor transport 100% Cycle transport 0%	Motor transport 81,25 % Cycle transport 18,75%	Motor transport -18,75 % Cycle transport +18,75 %	Motor transport -18,75 % Cycle transport +18,75 %

* Individual motor transport

C2.5 Society

Data BEFORE: The information about awareness level and perception of cycle transport services was gathered via questionnaires available on the city website and published in local media from July to November 2010. Answers were gathered from 137 respondents of Ústí nad Labem residents.

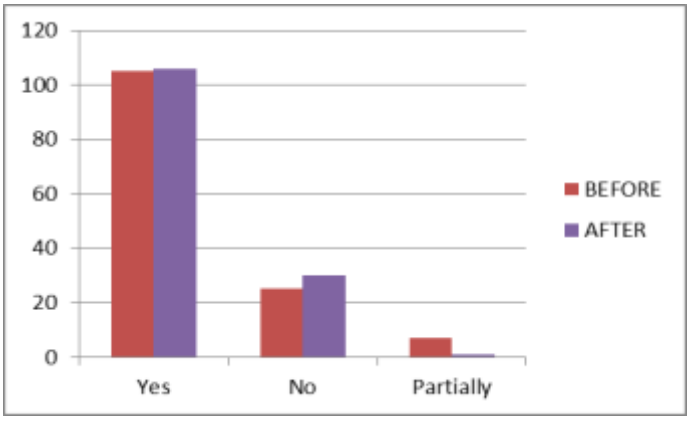
Data AFTER: The information about awareness level and perception of cycle transport services after implementing cycle transport improvements were gathered via questioners distributed to local residents during public events between May - September 2011. The sample size was also 137 respondents.

Awareness level (no. 13)

The questioners contained the following questions monitoring public awareness of available cycle transport opportunities in Ústí nad Labem:

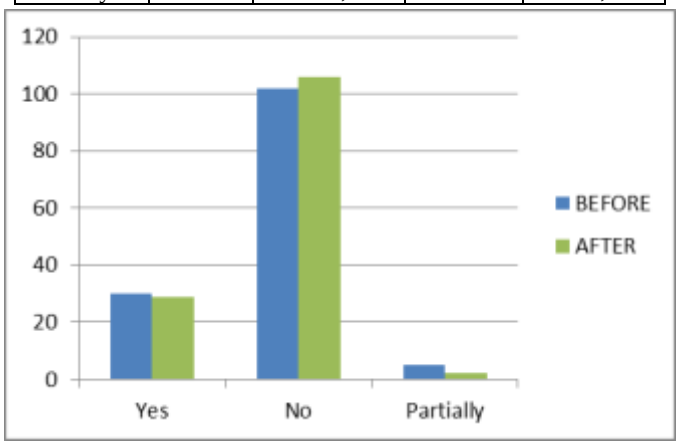
- Are you familiar with the cycle routes in the vicinity of Ústí nad Labem?

	BEFORE		AFTER	
Answers	**No.**	**Percentage**	**No.**	**Percentage**
Yes	105	76,64%	106	77,37%
No	25	18,25%	30	21,90%
Partially	7	5,11%	1	0,73%



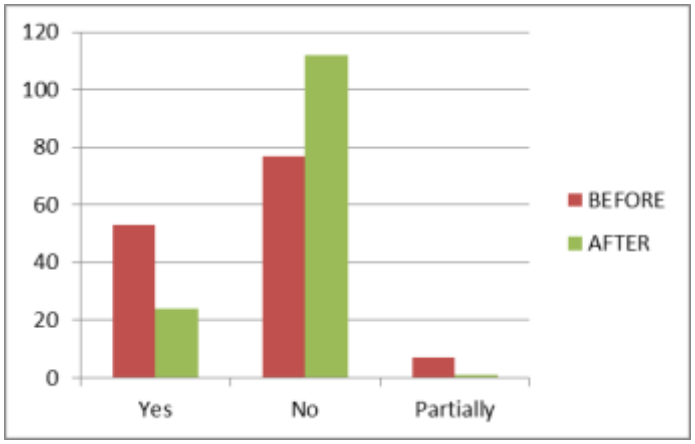
- Are you aware of the BYPAD recently conducted in the city?

	BEFORE		AFTER	
Answers	**No.**	**Percentage**	**No.**	**Percentage**
Yes	30	21,90%	29	21,17%
No	102	74,45%	106	77,37%
Partially	5	3,65%	2	1,46%



- Do you utilise cycle equipment in the city, such as bicycle stands?

	BEFORE		AFTER	
Answers	**No.**	**Percentage**	**No.**	**Percentage**
Yes	53	38,69%	24	17,52%
No	77	56,20%	112	81,75%
Partially	7	5,11%	1	0,73%

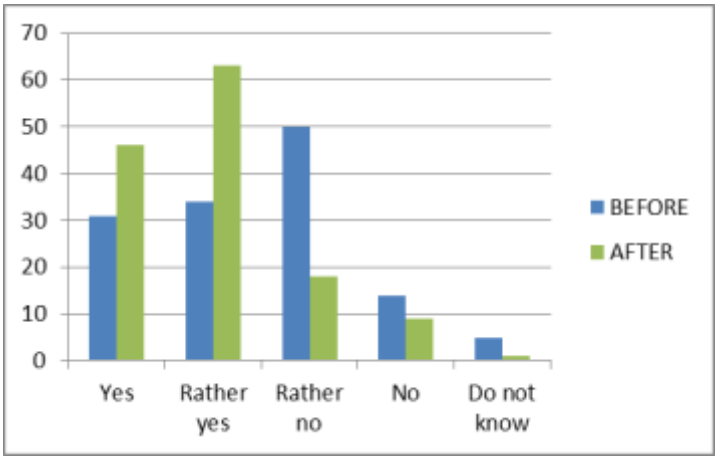


Acceptance level (no. 14)

The questioners contained the following questions monitoring public opinion on cycle transport services in Ústí nad Labem:

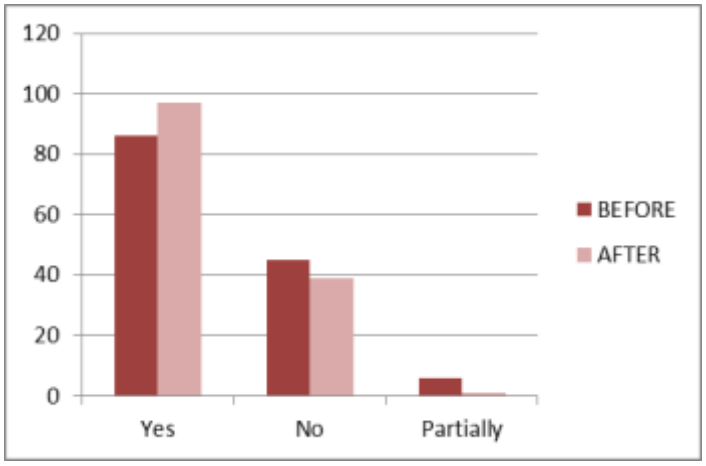
- Would you cycle regularly if the conditions for cyclists in Ústí nad Labem were favourable?

	BEFORE		AFTER	
Answers	**No.**	**Percentage**	**No.**	**Percentage**
Yes	31	22,63%	46	33,58%
Rather yes	34	24,82%	63	45,99%
Rather no	50	36,50%	18	13,14%
No	14	10,22%	9	6,57%
Do not know	5	3,65%	1	0,73%



- Are you afraid to ride a bike in the road traffic in the city?

	BEFORE		AFTER	
Answers	**No.**	**Percentage**	**No.**	**Percentage**
Yes	86	62,77%	97	70,80%
No	45	32,85%	39	28,47%
Partially	6	4,38%	1	0,73%



The positive answers were compared in the following table:

Table C2.5.1: Results for indicators related to society

Indicator	Before (2010)	B-a-U	After (2011)	Difference: After - Before	Difference: After – B-a-U
no. 13 - Awareness level	Average (76,64; 21,90; 38,69) = **45,74 %**	45,74 %	Average (77,37; 21,17; 17,52) **= 38,69 %**	-7,05 %	-7,05 %
no. 14 - Acceptance level	Average (24,82; 24,82; 62,77) = **56,20 %**	56,20 %	Average (33,58; 45,99; 70,80) **= 75,18 %**	+18,98 %	+18,98 %

C3 Achievement of quantifiable targets and objectives

The awareness and acceptance impacts were monitored through a survey among citizens.

The achievements for the indicators related to transport and environment are based on the outcomes of a modelling exercise considering a planned new cycling connection.

No.	Target	Rating
No. 13 - Awareness level	15 %	***
No. 14 - Acceptance level	15 %	***
No. 21 - Traffic flow by vehicle type	10 % increase of cyclists in individual transport	**
No. 29 - Average modal split (trips)	3 %	***
No. 8 - CO_2 emissions	0,05 %	NA
No. 9	0,05 %	***
No. 10	0,05 %	***
No. 11	0,05 %	NA
NA = Not Assessed O = Not Achieved * = Substantially achieved (at least 50%) ** = Achieved in full * = Exceeded**		

C4 Up-scaling of results

The measure is suitable for up-scaling.

Based on the successful implementation of the proposed cycle route, further cycle routes connecting the existing ones in the city should be completed in order to gain a complex cycling network with corresponding services and facilities for cyclists.

Individual steps suitable for cycle transport development and improvements are identified in the relevant action plan of the SUTP of Ústí nad Labem.

C5 Appraisal of evaluation approach

The solutions is proposing implementation of the new cycle route connecting the major cycle routes leading through the Usti region, helping to develop cycling in the area. The new cycle route was proposed in two variants. The first variant is using the existing transport infrastructure already implemented in the city (see the Figure C5.1) and the second variant is proposed in the optimal route (see the Figure C5.2).

The baseline for evaluation was the current state of transport infrastructure with the existing traffic intensities in the city. By the traffic model of the city, modal split and emissions exhausted by traffic with its source or destination in the area were calculated.

For the state after measure implementation, the existing transport infrastructure was supplemented with the new cycle route connecting the Elbe River route and the Ore Mountains route through the city, as described in the Archimedes deliverable R60.1 - Improving Cycle Transport in Ústí nad Labem.

Changes of modal split were calculated as changes of modal split of transport with its source or destination by this new cycle route, based on willingness of survey participants to use bicycle on the route. Changes of emissions were derived from the changes of modal split.

Public opinion was gathered from local cyclists and pedestrians of all ages in the city, during public events in the city centre and by the city website. Indicators of awareness level about cycle transport possibilities in the area and acceptance level of provided cycling opportunities were assessed. The survey of the state before was realised in 2010 (July to November), data for the state after were collected in 2011 (May – September).

Figure C5.1: Map of the cycle route connecting the existing cycling infrastructure in the area through current transport routes (variant 1)

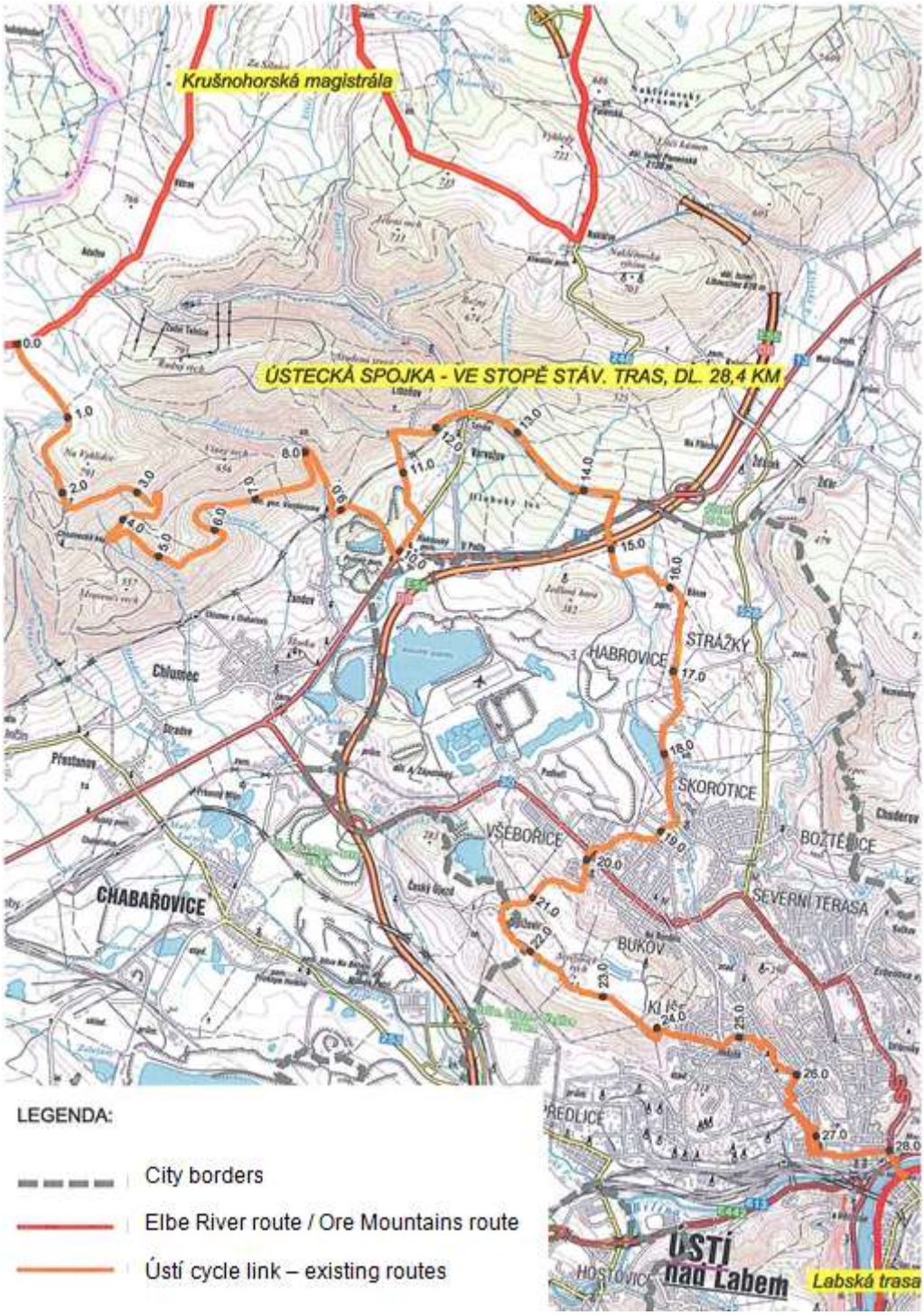


Figure C5.2: The new cycle route (orange and pink) proposed to connect the existing cycling infrastructure in the area and the city (variant 2)

C5.1 Traffic model of the city

The traffic model covers the entire cadastral territory of the city of Ústí nad Labem. It involves detail transport relations within the city, taking fully into account transport links leading from, to and across the city area. The model of the city simulates all details of the city road network, including directional lines, width ratios, number of driving lanes, permitted speed limit and PT routes. The transport infrastructure outside the city is modelled with fewer details, only to reflect national and international transport relations (Please see the Figure C5.3).

The proposed restrictions regulate traffic in the city centre while preserving routes for transit traffic. Due to the fact, that the city lacks suitable large capacity superior roads bypassing the sensitive area, it was necessary to maintain throughput of the main I and II class arteries.

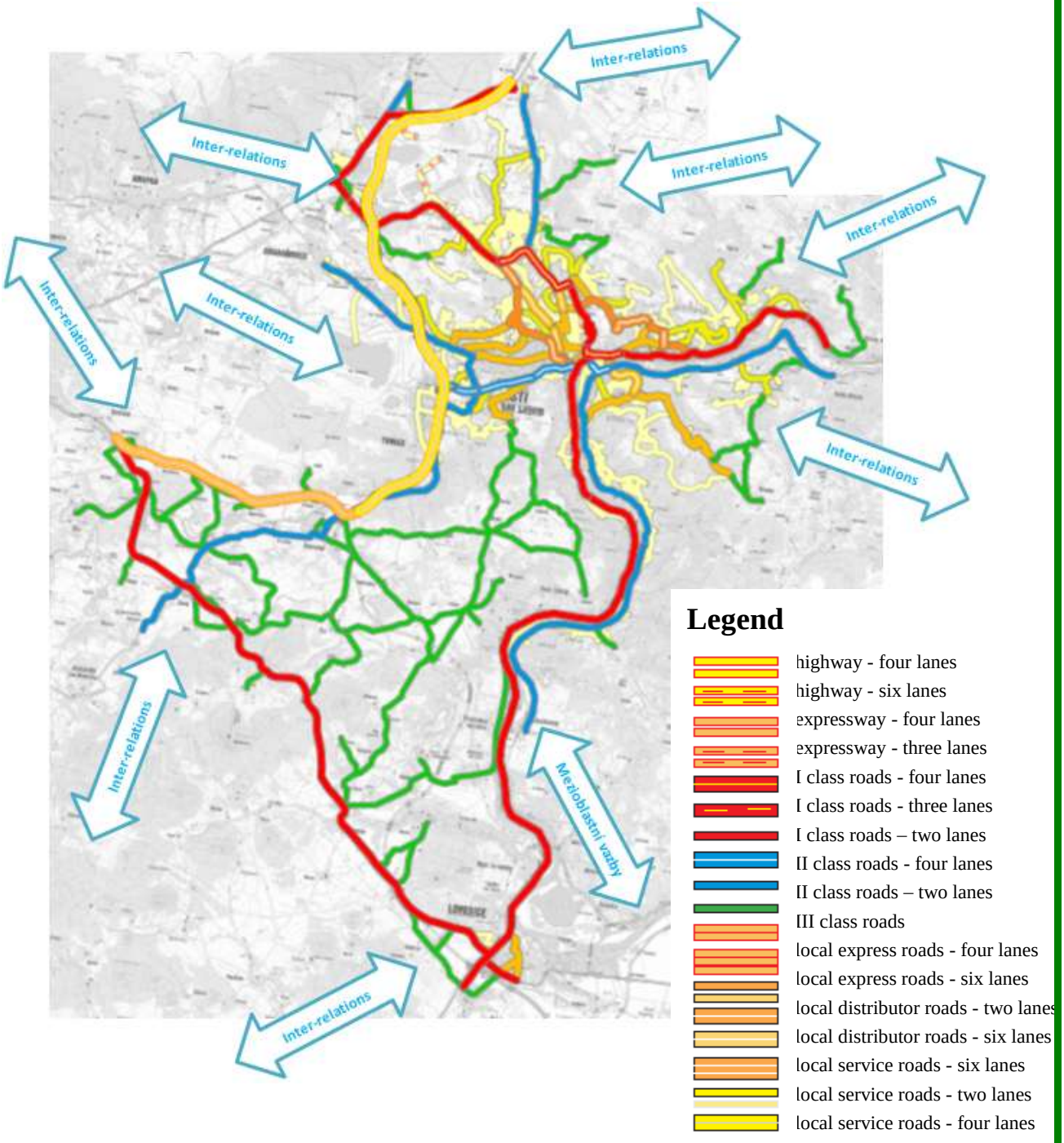
Calibration of the traffic model was realised by the national traffic census from the years 2005 and 2010, which is conducted every five years by the Directorate of Roads and Highways in the Czech Republic. Furthermore, the traffic model calculates with coefficients for predicted traffic growth officially published by the Directorate. These inputs provide an overview of the traffic performance and composition of the traffic flow on major roads on the entire territory of the Czech Republic.

To refine the model, Municipal employees realised traffic counting at selected locations in the city. In addition, data from sensors of traffic light devices, automatic traffic counters and schedules of public transport in the city were used for model calibrations.

Model simulations present the state of traffic in a perspective situation, according to set parameters, based on factors of traffic growth (with respect to the economic and social development), changes in transport infrastructure and changes in the distribution of transport sources and destinations.

Because of exact input data and sophisticated software, model results are considered reliable.

Figure C5.3: The physical extend of the city traffic model used for measure evaluation



C6 Summary of evaluation results

Assessment of feasibility of implementing a cycle route connecting the existing international cycle routes with Ústí nad Labem proved to be more effective in the variant requiring construction of new cycling infrastructure instead of utilising the existing routes. Experience with implementing the cycle route is suitable for up-scaling in order to reach a connected cycling network in the area and thus encourage modal shift towards cycling, which would also reduce negative effects of motor transport as presented by indicators of environment.

Survey of the public shows interest of local inhabitants in cycle transport development. Assessment of indicators of awareness and acceptance level revealed slight improvement of results, which was caused by launching a portal for cyclists on the city website, which gives complex information about cycling opportunities, facilities and services for cyclists, with the interactive map of all cycle routes, including relevant details, videos from the routes, photo gallery, safety advices and warnings, tips for cycle trips and more.

The key results are the following:

- **Key result 1** – improved conditions for cyclists and provision of suitable infrastructure and services would lead to increase of cyclists and greater number of trips realised in the city by bicycle, with positive effects on the city environment and inhabitants
- **Key result 2** – residents demand improvement of the current state of cycle transport in Ústí nad Labem
- **Key result 3** – implementation of new cycle routes is feasible and recommended

C7 Future activities relating to the measure

According to the BYPAD realised in the city within the CIVITAS Archimedes task 11.6.6, the potential for development of cycle transport in the city is quite high. The first step required to trigger the improvements is to establish a cycle-coordinator, who shall be in charge of cycle transport activities and of implementation of required actions.

Based on the BYPAD report, further steps and recommendations for cycle transport improvements were designed and included in the SUTP of Ústí nad Labem. BYPAD will be performed repeatedly in the city and monitor progress of the improvements.

Furthermore, traffic education including training of children in safe cycling will be further carried out by the Municipal Police of Ústí nad Labem for all primary school children and other volunteers in the city.

Specific steps defined in the Action plan for cycle transport improvements included in the SUTP of Ústí nad Labem will be gradually carried out, depending on the political will of city authorities and budget assigned for cycle transport improvements for each year – the priorities involve establishing a cycling coordinator responsible for required actions and progressive implementation of new cycling infrastructure and facilities as proposed in the plan.

Promotion and active participation of the city on cycling activities will be supported. The website for cyclists will be gradually maintained and updated.

D Process Evaluation Findings

D.0 Focused measure

X	0	No focussed measure
2*	1	Most important reason
3*	2	Second most important reason
6*	3	Third most important reason

*) Reasons from checklist in Guidelines for the Completion of the MERT

D.1 Deviations from the original plan

The existing cycling infrastructure, facilities and services in the area were mapped and the information was made accessible in the form of an interactive map on the website application on the city transport web portal. Additional cycling routes were designed. BYPAD audit was performed in the city. Specific cycle transport improvements were defined and included in the SUTP of Ústí nad Labem. Objectives of the measure were fulfilled.

D.2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **Barrier 6 (positional)** – Inconvenient existing conditions for cyclists in the city in terms of high elevation profile, insufficient cycling infrastructure, services and facilities.
- **Barrier 11 (spatial)** – Intensive motor traffic in the city restricts development of cycle transport.
- **Barrier 3 (cultural)** – Cycle transport is currently used primarily as a leisure time activity, not as a mode of transport.

Implementation phase

- **Barrier 9 (financial)** – Low budget for cycle transport improvements.
- **Barrier 11 (spatial)** – Limitations of the existing road infrastructure in the city.

Operation phase

- The measure was not put into operation, the action plan summarising actions required for cycle transport improvements was included in the SUTP of Ústí nad Labem.

D.2.2 Drivers

Preparation phase

- **Driver 7 (planning)** – BYPAD methodology enabled to reveal deficits and potential for development and formulate steps required for cycle transport improvements.
- **Driver 5 (involvement)** – Positive attitude of city residents and local cyclists towards cycle transport development.

Implementation phase

- **Driver 8 (organisational)** – Good cooperation with the Municipal Police on cycle transport education and organisation and participation on cycle transport events.

Operation phase

- The measure was not put into operation, the action plan summarising actions required for cycle transport improvements was included in the SUTP of Ústí nad Labem.

D.2.3 Activities

Preparation phase

- **Activities 7 (planning)** – Performing the BYPAD audit to reveal deficits and potential for cycle transport development and formulating steps required for improvements
- **Activities 4 (problem related)** – Mapping the existing cycling opportunities in the city
- **Activities 5 (communication)** – Discussions and workshops with city politicians and cyclists about cycle transport issues and its future development in the city
- **Activities 5 (involvement)** – Participation on cycling events in the area, gathering data from cyclists

Implementation phase

- **Activities 5 (communication)** – Launching the website informing about available cycle transport options, overview of cycling facilities and points of interest for cyclists, interactive map of cycle routes in the region with videos and photo gallery from the routes accompanied by detailed descriptions
- **Activities 5 (communication)** - Distribution of graphical brochures with road safety tips for cyclists
- **Activities 11 (spatial) –** Designing new cycle routes interconnecting the existing cycling network in the region through Ústí nad Labem using the existing routes, calming motor traffic and proposing dedicated lanes for cyclists (where suitable in combination with PT)

Operation phase

- The measure was not put into operation, the action plan summarising actions required for cycle transport improvements was included in the SUTP of Ústí nad Labem.

D.3 Participation

D.3.1. Measure Partners

- **Measure partner 1 –** Statutory City of Ústí nad Labem: development of studies, proposals and recommendations, performing the BYPAD, defining cycle transport improvements, launching a website application
- **Measure partner 2** - Municipal Police of Ústí nad Labem: traffic education, organisation of cycling events

D.3.2 Stakeholders

- **Stakeholders 1 –** cyclists and potential users
- **Stakeholders 2 –** children participating in traffic education

D.4 Recommendations

D.4.1 Recommendations: measure replication

- **Recommendation 1 –** Format of the website for cyclists is suitable for replication
- **Recommendation 1 –** Brochures for cyclists about road safety tips can be used in different cities

D.4.2 Recommendations: process

- **Recommendation 1 –** To gain political support and involve the interested parties in development of proposals for improvements
- **Recommendation 2 –** To ensure financial resources for development of cycling infrastructure required in the city
- **Recommendation 3** – Cycle transport development requires implementation of restrictions for intensive motor transport in the city, especially in the city centre and in residential areas
- **Recommendation 4** – Promotion of cycling activities and efforts for improvements is needed
- **Recommendation 5** – It is recommended to establish a cycle transport coordinator responsible for continuous efforts for cycle transport improvements