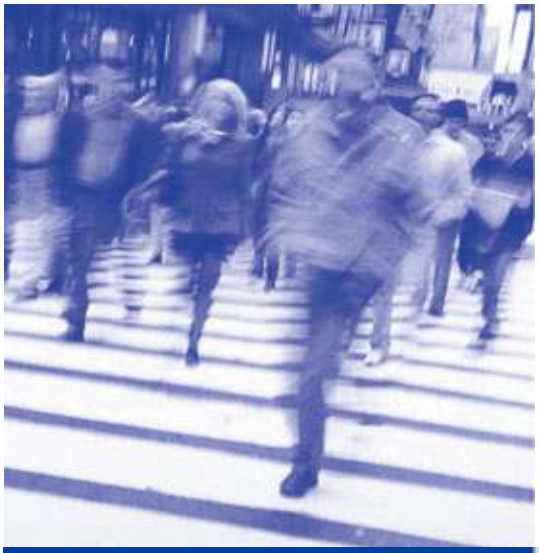

CiViTAS

Cleaner and better transport in cities

ÚSTÍ NAD LABEM

D11.12 SUTP Development in Ústí nad Labem

November 12

THE CIVITAS INITIATIVE
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1 Introduction

1.1 Background CIVITAS

CIVITAS - cleaner and better transport in cities - stands for CIty-VITAlity-Sustainability. With the CIVITAS Initiative, the EC aims to generate a decisive breakthrough by supporting and evaluating the implementation of ambitious integrated sustainable urban transport strategies that should make a real difference for the welfare of the European citizen.

CIVITAS I started in early 2002 (within the 5th Framework Research Programme);
CIVITAS II started in early 2005 (within the 6th Framework Research Programme) and
CIVITAS PLUS started in late 2008 (within the 7th Framework Research Programme).

The objective of CIVITAS-Plus is to test and increase the understanding of the frameworks, processes and packaging required to successfully introduce bold, integrated and innovative strategies for clean and sustainable urban transport that address concerns related to energy-efficiency, transport policy and road safety, alternative fuels and the environment.

Within CIVITAS I (2002-2006) there were 19 cities clustered in 4 demonstration projects, within CIVITAS II (2005-2009) 17 cities in 4 demonstration projects, whilst within CIVITAS PLUS (2008-2012) 25 cities in 5 demonstration projects are taking part. These demonstration cities all over Europe are funded by the European Commission.

Objectives:

- to promote and implement sustainable, clean and (energy) efficient urban transport measures
- to implement integrated packages of technology and policy measures in the field of energy and transport in 8 categories of measures
- to build up critical mass and markets for innovation

Horizontal projects support the CIVITAS demonstration projects & cities by:

- Cross-site evaluation and Europe wide dissemination in co-operation with the demonstration projects
- The organisation of the annual meeting of CIVITAS Forum members
- Providing the Secretariat for the Political Advisory Committee (PAC)
- Development of policy recommendations for a long-term multiplier effect of CIVITAS

Key elements of CIVITAS:

- CIVITAS is coordinated by cities: it is a programme “of cities for cities”
- Cities are in the heart of local public private partnerships
- Political commitment is a basic requirement
- Cities are living ‘Laboratories' for learning and evaluating

1.2 Background ARCHIMEDES

ARCHIMEDES is an integrating project, bringing together 6 European cities to address problems and opportunities for creating environmentally sustainable, safe and energy efficient transport systems in medium sized urban areas.

The objective of ARCHIMEDES is to introduce innovative, integrated and ambitious strategies for clean, energy-efficient, sustainable urban transport to achieve significant impacts in the policy fields of energy, transport, and environmental sustainability. An ambitious blend of policy tools and measures will increase energy-efficiency in transport, provide safer and more convenient travel for all, using a higher share of clean engine technology and fuels, resulting in an enhanced urban environment (including reduced noise and air pollution). Visible and measurable impacts will result from significantly sized measures in specific innovation areas. Demonstrations of innovative transport technologies, policy measures and partnership working, combined with targeted research, will verify the best frameworks, processes and packaging required to successfully transfer the strategies to other cities.

1.3 Participant cities

The ARCHIMEDES project focuses on activities in specific innovation areas of each city, known as the ARCHIMEDES corridor or zone (depending on shape and geography). These innovation areas extend to the peri-urban fringe and the administrative boundaries of regional authorities and neighbouring administrations.

The two Learning cities, to which experience and best-practice will be transferred, are Monza (Italy) and Ústí nad Labem (Czech Republic). The strategy for the project is to ensure that the tools and measures developed have the widest application throughout Europe, tested via the Learning Cities' activities and interaction with the Lead City partners.

1.3.1 Leading city innovation areas

The four Leading cities in the ARCHIMEDES project are:

- Aalborg (Denmark);
- Brighton & Hove (UK);
- Donostia-San Sebastián (Spain); and
- Iasi (Romania).

Together the Lead Cities in ARCHIMEDES cover different geographic parts of Europe. They have the full support of the relevant political representatives for the project, and are well able to implement the innovative range of demonstration activities.

The Lead Cities are joined in their local projects by a small number of key partners that show a high level of commitment to the project objectives of energy-efficient urban transportation. In all cases the public transport company features as a partner in the proposed project.

2 Ústí nad Labem

Ústí nad Labem is an important industrial, business and cultural centre in the North-West of the Czech Republic. The city's population is around 94,000 living in an area of 94 km2. The city is a home to the Jan Evangelista Purkyně University with eight faculties and a large student population. The city was the former base for a large range of heavy industries, leading to damage of the natural environment, which is now the major focus of improvement and care.

Usti nad Labem is known as the "Gateway to Bohemia" thanks to its beautiful location in the deep valley of the Elbe River, surrounded by the Bohemian Massif. To the south, it neighbours the Bohemian Uplands, and to the north the Krušné Mountains. The western part of the city is bordered by the Podkrušnohorská Basin, featuring open-cast coal mines.

The city is situated about 20 km from the German border. It has an advantageous position at a railway junction, at the important international waterway Elbe, and in the near future, it will be fully connected to the D8 motorway, running from Prague to Dresden.

Usti nad Labem joined CIVITAS ARCHIMEDES in 2008 as a learning city with the main objective to develop an efficient transport organisation for the city. Based on results of numerous research studies, several public campaigns and experience of the leading cities of the project, the city aimed to develop its Sustainable Urban Transport Plan. It corresponds with the Master Plan of Ústí nad Labem, which was initiated in 2007 and adopted in its first form in 2011. The opportunity to integrate Sustainable Urban Transport Planning best practices into plan development during the project means an ideal match of timing between city policy frameworks and the ARCHIMEDES project.

3 Background to the Deliverable

Based on the research and analysis realised within the CIVITAS ARCHIMEDES project and experience of its leading cities (Aalborg, Brighton & Hove, Donostia San Sebastian and Iasi), the city of Ústí nad Labem is developing the Sustainable Urban Transport Plan (SUTP). It is a strategic document specifying long term transport policy for the city. The plan presents an overview of goals, objectives and actions the city has for its transport development. During the approval process, the City Council assigns specific responsibilities for the set actions, time schedule for their implementation and financial resources required to reach the defined goals.

The SUTP of Ústí nad Labem is aimed primarily at development of public transport, optimisation of city traffic, support of pedestrian and cycling modes, improvement of road safety and reduction of negative impacts of motor transport on the city environment.

4 SUTP development in Ústí nad Labem

4.1 Background of the Document

This document is an English language summary of the Sustainable Urban Transport Plan of Ústí nad Labem. The document is based on the Master Plan of Ústí nad Labem. It addresses current transport conditions and develops scenarios for future development on the city territory. It deals with functioning of the transport system, where the key aspects are preservation of city functions and meeting requirements for mobility, safety, traffic flow and accessibility of transport services to all.

It defines weaknesses of the transport system in Ústí nad Labem, in consistency with the approved "Strategy for Development of the City of Ústí nad Labem for the Year 2015"; for example lack of necessary coverage in the core road network with missing tangential and bypass routes, which are both technically and financially challenging to implement.

Disadvantages of an incomplete backbone transport network are thus compensated by proposing maximum implementation of packages of measures that would lead to regulation of motor transport, more appropriate modal split, introduction of a modern transport management system, increased safety, improved efficiency of usage of the current infrastructure, development of non-motorised transport and reduction of negative effects of transport on the city environment.

The document respects decisions made by the City Government and involves proposals of only such transport structures, which are already approved in the list of investment projects of the Master Plan of Ústí nad Labem.

Unlike the territorial development, where a significant part is financed by private funds and regulated by the Master Plan, functioning of transport on the city territory is predominantly a public initiative and responsibility and, therefore, the role of city authorities in implementation of regulations, management and operation of transport is essential.

Currently, the main issue is a lack of political will to carry through restrictions and ensure financial resources.

4.1.1 Structure of the Document

The full SUTP describes, in more than 500 pages and a number of annexes, the required development of sustainable transport in the city.

The SUTP is divided into 5 main chapters.

The first part is the introduction, which is devoted to the role of the SUTP in Ústí nad Labem, its goals and visions of sustainable development of transport.

The second chapter analyses the current state of transport in Ústí nad Labem. It contains assessment of local traffic for various transport modes in relation to broader transport links, demography, mobility of inhabitants, etc. The current transport performance and resulting traffic intensity is examined. It describes in detail the infrastructure of the road, rail, water, air and public transport. It further presents infrastructure for walking and cycling in the city. It identifies transfer of transport related information and the existing transport management scheme.

The following, third, chapter presents a prognosis of future mobility of the population, which assesses trends and forecasts development of motorisation, modal split and traffic intensities in the prospective of different time horizons and investment scenarios.

The fourth part of the document deals with proposals for improving transport and transport infrastructure for individual modes of transport, including solutions for public transport, parking regulation, proposals to improve conditions for walking and cycling and the use of telematics as a tool for efficient traffic management, surveillance, restrictions and providing on-line information. An important part of the document is dedicated to increasing road safety and reducing traffic accidents in the city and their consequences. Also, reliability of the transport system is essential for the city to function of and it is addressed as a crucial aspect of public transport development.

The fifth and final chapter of the SUTP summarises the results, findings and recommendations for each aspect of city transport in main points.

Individual chapters of the SUTP involve a total of 9 action plans addressing specific aspects of transport. Each of them consists of a range of proposals for measures to be implemented in the city. The action plans will be submitted to city authorities for approval and for setting up responsibilities, financial and personal resources and time schedule for their gradual implementation.

4.1.2 Visions and Goals

The document has its basis in documents already approved and valid in the city as strategic documents influencing transport development. These are:

- Policy for Territorial Development in the Czech Republic (2008)
- Principles for Territorial Development of the Ústí region (2011)
- Master Plan of Ústí nad Labem (2011)
- Strategy for Development of the City of Ústí nad Labem for the Year 2015 (2007)

The need for the SUTP was formed by several factors:

- The city has an advantageous position about 20 km from the German border, at a railway junction, at the important international waterway Elbe, and in the near future, it will be fully connected to the D8 motorway, running from Prague to Dresden, resulting in dense traffic in the city
- It is an industrial centre of the region and a former base for a large range of heavy industries, leading to damage of the natural environment, which is now the major focus of improvement and care
- It is a business centre facilitating working opportunities and a cultural centre of the region with a university, which results in high population density
- Attractive nature surrounding the city generates tourism and leisure trips
- Growing economic standard and increasing level of motorisation in the Czech Republic results in higher demands on transport and mobility

The primary goal of city transport development is to reach:

- Mobile city allowing its citizens
- City suitable for business and culture
- Accessible city
- City oriented towards its citizens
- City attractive for living and visiting
- City allowing to participate in decision-making processes
- Healthy city
- Safe city

According to the White Paper on EU Governance, transport requirements and aims for long-term development of transport are defined by the following:

The primary objective of the European transport policy is to establish a system that supports progress of the European economy, increasing competitiveness and supply of high quality services with more efficient use of resources. In practice, transport should be using less and cleaner energy, make better use of a modern infrastructure and reduce negative impacts on the environment.

There is a need to find a new way of arranging transport services and provision, which can transport a larger volume of cargo and passengers to their destinations through the most efficient means of transport, either singly or in their combination. Individual transport should be used primarily for the final stage of a journey and realised by ecological vehicles. Information technologies should ensure simple and reliable data transfers. Transport users should pay the full transport costs in exchange for reduction of congestions, more information, better services and greater safety.

Future transport development in accordance with the White Paper should be based on the following preconditions:

- improved energy efficiency of vehicles, use of sustainable fuels and propulsion systems;
- optimised multimodal logistic chains, use primarily of those types of transport which are resource-efficient;

- more efficient use of transport and infrastructure through improved traffic management systems and transport information
- implementation of advanced logistics and market measures, such as full development of an integrated European rail transport, removal of restrictions on cabotage, removal of barriers for short sea shipping and transport, non-distorted valuation of outputs of transport services, etc.

In the field of transport, cities mostly suffer from congestion, poor air quality, and noise pollution. Transport in cities produces approximately one-quarter of CO_2 emissions. Around 69% of road accidents happen in cities.

Gradually abandoning conventionally powered vehicles in the urban environment constitutes a major contribution to reduction of dependence on oil, greenhouse gas emissions, local air pollution and noise. This requires development of an appropriate infrastructure, application of environmentally-friendly fuels and reduction of traffic intensity through restrictions and fees. Development of electro-mobility and hybrid cars is recommended.

A higher share of public transport combined with minimal administrative and operational duties and elimination of obstacles for users during provision of services would enable to increase density, frequency and quality of PT services and encourage their greater use.

Demand management and accurate territorial planning with good knowledge of local conditions can contribute to a reduction in the total volume of traffic and transport in cities. Improving conditions for walking and cycling should be an integral part of urban mobility and proposals for urban infrastructure. Use of smaller, lighter and more specialised private vehicles should be encouraged. Especially large fleets of city buses, taxis, delivery vehicles and commercial vehicles are particularly suitable for introducing alternative propulsion systems and fuels. This should significantly contribute to reduction of the carbon burden from the urban activity as well as provide a test platform for new technologies and opportunities for early application on the market. Valuation and pricing of road transport and elimination of distortions in taxation may also help to strengthen usage of public transport and to apply new trends in alternative propulsion technologies.

The link between the transport of freight over long distances and transport in the final stage should be organised more efficiently. The purpose is to reduce individual supply, which is the least efficient part of the transport process.

The use of intelligent transport systems contributes to transport management implemented in real time and reduces supply times and congestion near the target distribution place. The last part of the transport chain could be carried out by urban goods vehicles with low emissions, with the use of electric, hydrogen and hybrid technologies, which would not only reduce air pollution and noise, but would also allow a larger share of cargo transport to be carried out in urban areas at night time, which would help to reduce traffic congestion during the morning and afternoon peak periods.

The main purpose of the SUTP of Ústí nad Labem is to provide background information and solutions for current transport situation in the city in order to:

- Improve conditions for motor transport:
    - Improve road safety
    - Improve traffic fluency
    - Improve parking conditions

- Improve the urban environment
  - Calm the city centre
  - Reduce emissions
  - Improve road safety
- Support development of cycle transport
  - Develop cycling infrastructure
  - Establish facilities and services for cyclists
  - Promotion and training for actual and potential users
  - Improve traffic supervision and safety of cyclists
- Support use of road-based public transport
  - Improve quality of PT services
  - Introduce priority for PT vehicles in city traffic
  - Integrate public transport services
  - Promotion and dissemination of PT
- Improve conditions for pedestrians
  - Improve safety of pedestrians
  - Establish safe pedestrian crossings
  - Calm public spaces and improve their attractiveness
- Support use of railway transport
  - Development and modernisation of railway infrastructure
  - Improve quality of railway transport services
- Support use of water transport
  - Development of inland water transport
  - Improve reliability of water transport
  - Exploitation of Elbe river potential
- Ensure sustainability of transport development in the city
  - Support use of the non-motorised transport and renewable resources
  - Ensure functions of the city
  - Satisfy needs of inhabitants and visitors
  - Protect the environment

4.2 Analysis of the Current State of Transport in the City

4.2.1 General Context

The chapter describes geographical and administrative arrangement of the area, as well as broader transport relations of the city.

Ústí nad Labem is known as the “Gateway to Bohemia” thanks to its beautiful location in the deep valley of the Elbe River, surrounded by the Bohemian Massif. To the south, it neighbours the Bohemian Uplands, and to the north the Krušné Mountains. The western part of the city is bordered by the Podkrušnohorská Basin, featuring open-cast coal mines.

The city is situated about 20 km from the German border. It has an advantageous position at a railway junction, at the important international waterway Elbe, and in the near future, it will be fully connected to the D8 motorway, running from Prague to Dresden.

In the current state, the potential of water transport is not utilised due to unstable navigability of the Elbe River, reducing the volume of transported goods by waterway transport.

Cycle transport is the least utilised mode of transport due to unfavourable conditions, such as lack of dedicated infrastructure and facilities, challenging relief of the territory and intensive traffic.

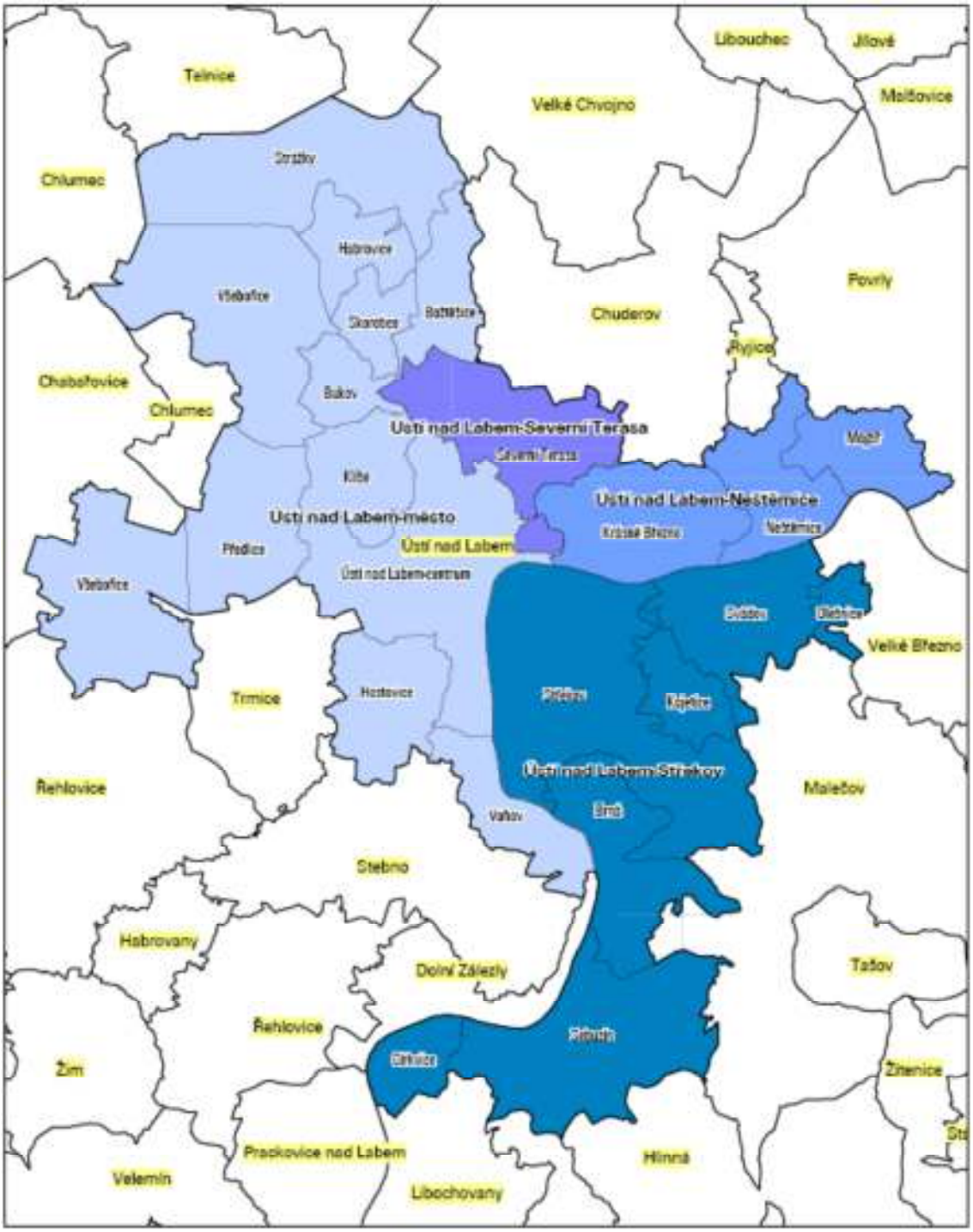
There is a small airport of local importance located at the western part of the city territory. Its runway has a grass surface and the airport is used mainly for sport aircrafts.

Chapter 5 of the SUTP describes the major transport corridors and links of the territory, which need to be considered in the process of future development of the city transport infrastructure.

4.2.2 Demography

The chapter describes development of city population since the Industrial Revolution in 1830 and its migration links. It presents the age, education and economic structure of inhabitants, their productive potential and related characteristics. It defines historical progress of administrative borders of the city and development of build-up areas.

Figure 1 - Administrative scheme of the city



4.2.3 Current State of Mobility

4.2.3.1 Commuting

The city represents a centre of the region, particularly in terms of culture, business and public administration.

The city has the highest balance of commuters in the region. According to the national census realised in 2001, the balance has reached 3 535 persons, which was calculated as the difference between 9 965 commuters into the city and 6 430 commuters away from the city per day.

It was found out that the commuters significantly differ in their educational structure. Whereas people travelling to work in the city finished high school or higher education, inhabitants travelling away from the city reached mostly apprenticeship or secondary education.

Moreover, the balance of commuters travelling to education is higher than to work. With its University and numerous study opportunities, Ústí nad Labem is a main regional centre for education.

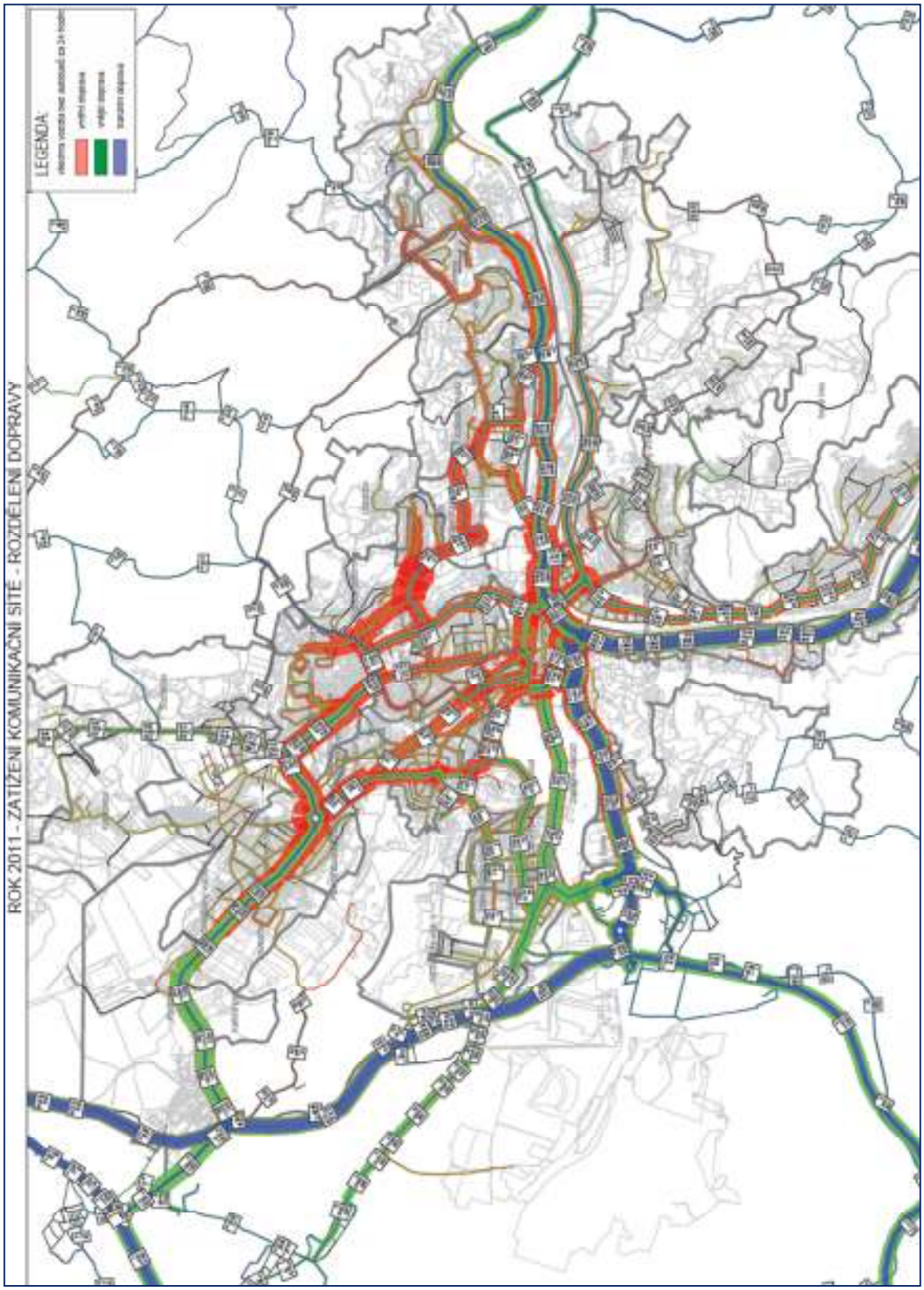
4.2.3.2 Transit Traffic

Transit traffic has an important share in the city. The major transit flow is between Germany and the Czech Republic. After completion of the highway D8, the major part of this traffic should be transferred from the I and II class roads in the region to this large capacity highway situated in the western part of the territory.

This requires construction of the last part of the highway between Lovosice – Řehlovice. Completion of the highway is being delayed due to resistance of environmentalists protesting against this large capacity road infrastructure. The deadline stated for completion of the highway by the Directorate of Roads and Highways of the Czech Republic is the year 2015 and until this is achieved it will be difficult to improve many aspects of the urban transport system.

Currently, transit traffic passes through the city centre and through residential areas in the city and there are no bypassing roads suitable for redirecting the unnecessary traffic and thus eliminating this burden from sensitive parts of the city.

Figure 2 - Traffic intensity on the city territory - transit traffic marked in blue (year 2011)



4.2.3.3 Major Transport Origins and Destinations in the City

The city represents a source and destination of traffic in a broad area as well as for internal transport.

The major origins and destinations of transport are primarily the city centre (offices and businesses), the residential areas (Severní Terasa, Neštěmice), the industrial zones (mainly Předlice, Střekov, the transhipment terminal port on the Elbe River or the stone quarry at the Mariánská rock), and the commercial zones (i.e. Trmice).

4.2.3.4 Transport Demand

To ensure quality of life of city inhabitants, it is important to satisfy their transport demands. The basic factors, which influence selection of transport mode and satisfaction, are:

- Transport time – the basic factor, which depends on provision of infrastructure and quality of services
- Time and space accessibility – determines the degree of coverage by transport infrastructure and possible extent of usage (higher density of the road network allows better range of services)
- Comfort – a subjective factor important for transport mode selection, which is influenced by quality of services
- Safety – it is not the major factor influencing transport demand but it should be priority of transport operators to ensure transport safety (i.e. in PT) and the city should provide safety for vulnerable road users, such as pedestrians and cyclists, and especially children)
- Costs – important factor involving ride fees, fuel costs, infrastructure payments, parking fees, etc.

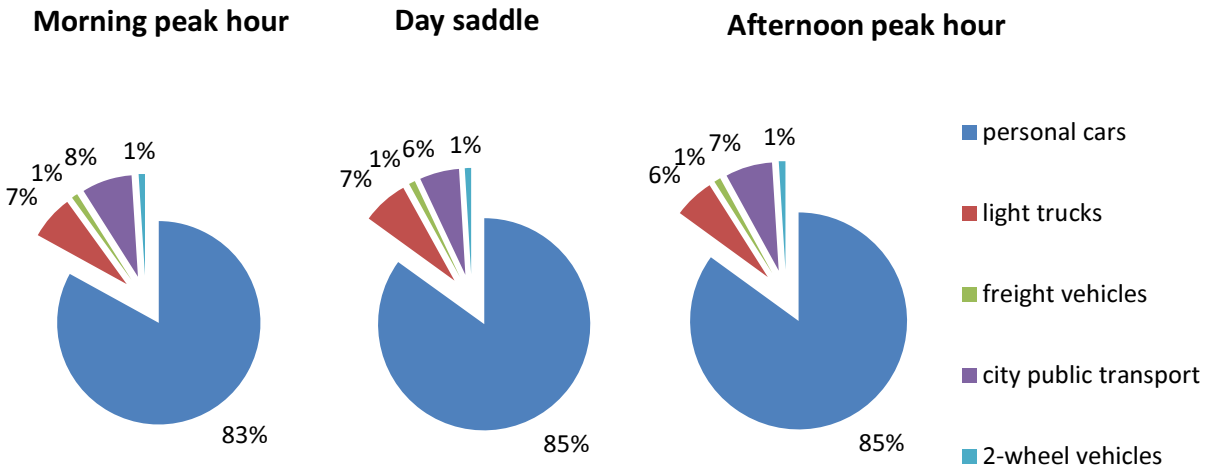
To identify transport demand, different groups of transport users had to be identified:

- City residents – require dense transport network covering all parts of the city, which, however, should be sustainable from economic, social and ecological point of view
- Commuters – require good links to surrounding centres and major transport corridors
- Visitors and other irregular travellers – require good access to the city and to the major points of interest in the city
- Passing travellers – require fast and fluid transit through or around the city without congestion (although such suitable large-capacity transit route will remain missing in the area until the missing link of the D8 highway is completed)
- Cyclists – require cycling infrastructure and convenient conditions, such as provision of facilities and services for cyclists (i.e. marked cycle routes, dedicated lanes, calm traffic, connected cycling network, bike rentals, storage spaces, cycle buses, cycling events) which is largely missing in the city
- Pedestrians – require safe routes, optimally barrier-free, calm and attractive, which are easily accessible and comfortable

4.2.3.5 Modal Split

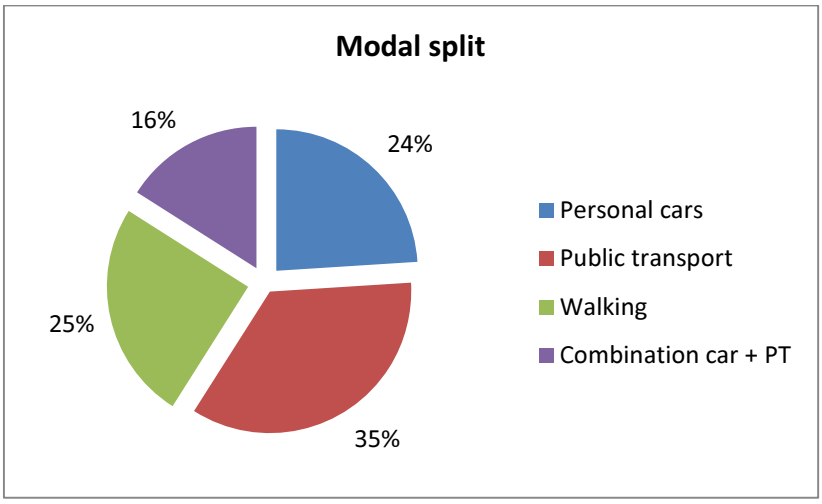
Length of the road network in the city is 10 530 km, of which 2 970 km are local distributor roads and 7 560 km are service roads and tertiary roads. Various regulatory measures are applied on the local roads, such as entrance prohibition, entrance allowed only for public transport, one-way roads, etc. 19 intersections in the city (6 of them are in the city centre) are traffic light controlled. The total average flow in both directions on a working day is 42,7 thousand vehicle-kilometres.

Chart 1 - Modal split in Ústí nad Labem



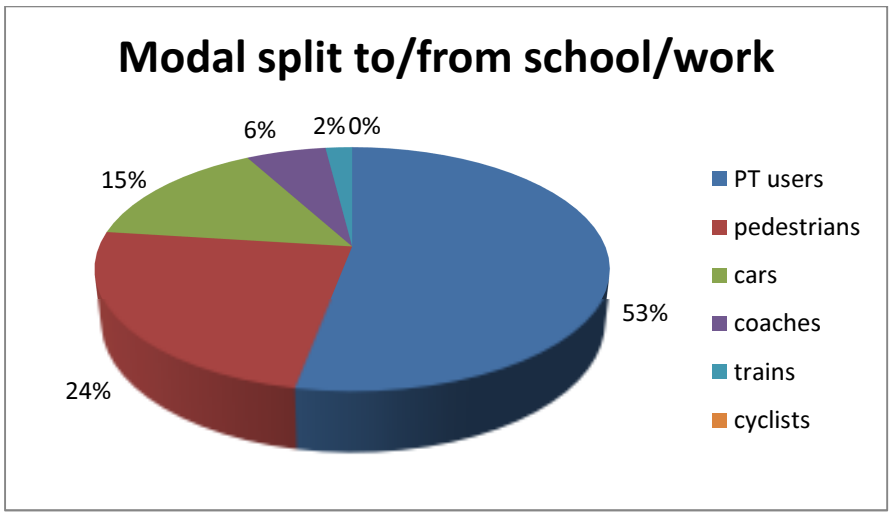
Determination of the number of trips made in the city centre was based on data about population in this area, data on transit traffic and data on transport and mobility of its inhabitants. The share of trips in the modal split is presented in the following chart.

Chart 2 - Modal split – Trips realised by various modes of transport in the city centre



Modal split in the city reveals high usage of urban PT by city residents, especially to work or school (53%). The second most utilised mode of transport is walking (24%), which is higher than personal car use (15%). Due to the unfavourable conditions in the city, cycling is the least used mode of transport for travels to/from school/work (less than 1%).

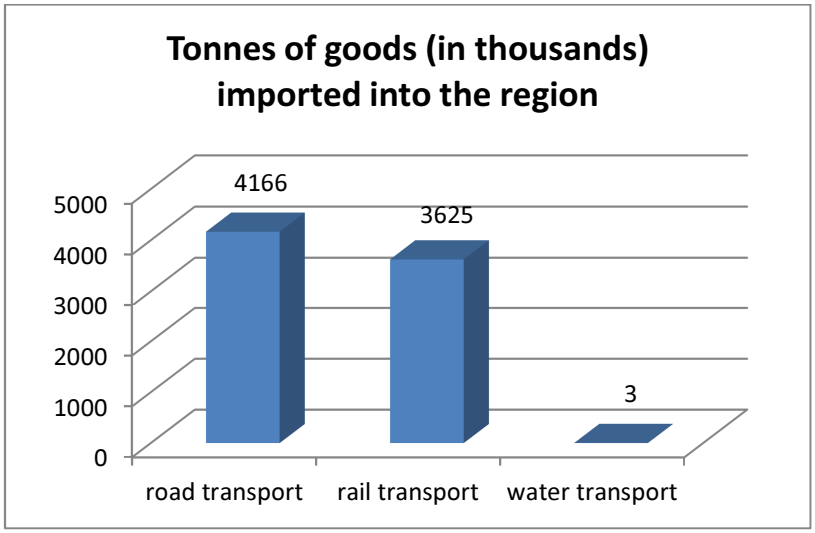
Figure 3 - Modal split for trips to/from school/work in Ústí nad Labem

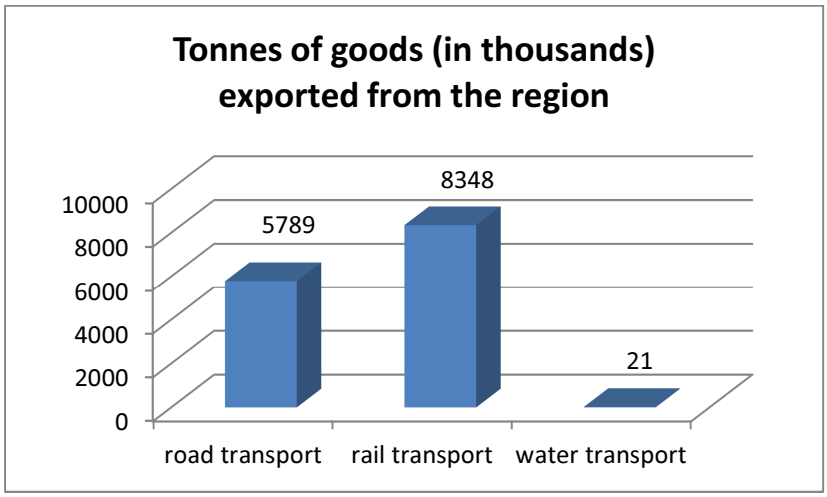


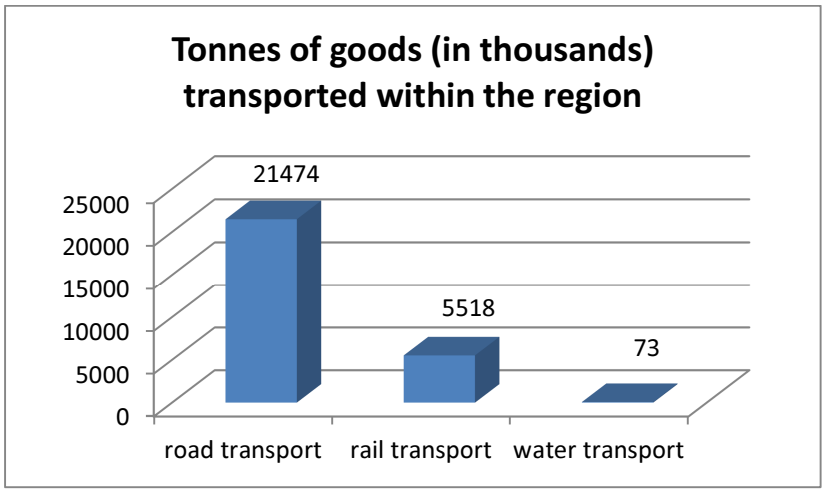
In the region, export of goods is realised mainly by rail (58.9%) and also by road (40.9%). Export by inland waterway is rather negligible - in 2009, it was amounted to 21 000 tonnes. For goods imported to the region, transportation by rail and road is more balanced. In 2009, 49,5% of import was realised by railways and 53,4% by roads.

In overall, goods are in the Ústí region transported mainly by road transport. In 2009, it was counted as 79% of all transported goods, which was about 4times more than by rail transport.

Graph 1 – Transportation of goods by different modes of transport in the Ústí region







4.2.3.6 Transport Model

The traffic planning software PTV-VISION from the company PTV Karlsruhe was used for development of the traffic model of Ústí nad Labem, which was used to simulate traffic load and assess proposed solutions.

The software VISEM 8.10 is part of PTV-VISION and is used for modelling the transport demand. The input data are: division of the area into individual zones, demographic and activity information for each zone, transport behaviour patterns of homogeneous groups of inhabitants, decision-making algorithms, the offer of the transport network and the offer of transport services. The output data are matrices of traffic volumes divided into three categories: personal vehicles, light trucks (less than 3.5 tonnes) and other freight vehicles (above 3.5 tonnes).

The software VISUM is another part of the package PTV-VISION ®, which matches transport demand matrices to the appropriate parameterised transport network. The matching is dependent on load capacity, iterative steps, defined network nodes and lines, length, category, capacity, initial speed, intersections, allowed movements and length of delay. VISUM allows tracking the differences in the burden of road network for different scenarios and different time periods. The final output is the annual average daily traffic (AADT)intensity on the network.

The traffic model was based on following documents:

- National traffic census (2005)
- Directional survey on border crossings (2005)
- Timetable for construction work on highways and expressways in the Czech Republic
- Statistical lexicon of Municipalities in the Czech Republic (2005)
- Results of traffic surveys conducted by the Municipality of Ústí nad Labem (2009 – 2012)
- Regulatory plan of Ústí nad Labem (2005)

The road network model is based on the model of private vehicles in the Czech Republic calculated to the level of 3rd class roads, including roads of European importance abroad. It was elaborated as a research project for the Ministry of Transport in the Czech Republic. This model is continuously updated and used for the needs of local authorities.

When processing the traffic model of Ústí nad Labem, the nationwide model of road network system served as a basic material. It was resized within the borders between the roads I/7, I/16, I/9 and the state border. Further calculations and analysis are based on the local model.

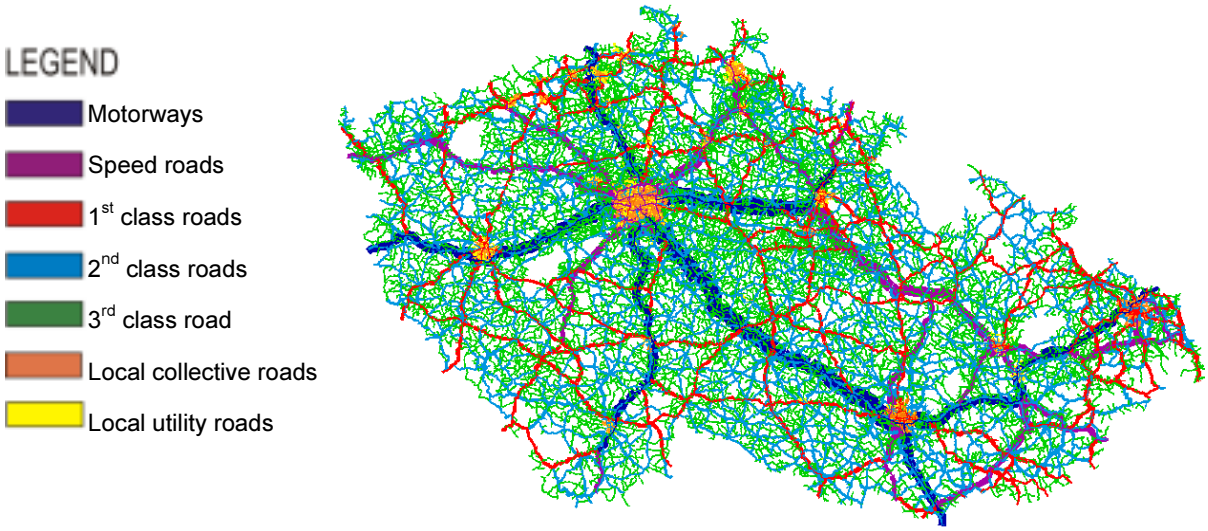
The traffic model was used to simulate the current state of transport and the foreseen future state of the traffic load in 2012. The input data correspond with the Regulatory plan of the city from the year 2005.

The road network in the traffic model is divided according to the type into:

- Motorways
- Expressways
- 1st class roads (rural)
- 2nd class roads (rural)
- 3rd class roads (rural)

- Local speed roads (urban arterials)
- Local collective roads (urban)
- Local utility roads (urban)

Figure 4 – The traffic model of the Czech Republic



For more details on traffic model, please see the CIVITAS deliverable R28.1, chapter 4.1.

4.2.3.7 Traffic Intensity

Traffic intensities are established for Ústí nad Labem on the basis of model-based forecasts of the software VISUM.

Congestions are created in the city on everyday basis. It is mainly due to:

- Incomplete transport network on the city territory
- Insufficient capacity of the transport infrastructure

Frequent congestions, especially on intersections at Pod Větruší (should be eliminated by completion of the Highway D8), Předmostí, Velká Hradební, Masarykova and W. Churchilla, cause negative impacts to the city environment and require a solution, which would lead traffic from one side of the city to the other fast and without burdening sensitive city parts.

Traffic load at individual roads in the city is graphically presented in the Annex of the full SUTP of Ústí nad Labem.

4.2.4 Current Transport Infrastructure

4.2.4.1 Road Infrastructure

The city of Ústí nad Labem is an important transport source and destination for both passenger and freight transport. The majority of transit traffic passes on the axis between the Czech Republic-Germany. There are two international routes leading through the territory,

E442 (east-west direction) and E55 (south-north direction), which lead through the city as I and II class roads and partially as the Highway D8.

The first class roads and the highway leading through the territory are under the possession and administration of the Directorate of Roads and Highways of the Czech Republic. These roads are among the most frequented roads in the area, connecting the city with other cities in the region and providing international transport links. Roads of II and III classes primarily connect the city with surrounding areas and less frequented destinations.

For more details on road infrastructure in Ústí nad Labem, please see the CIVITAS deliverable R26.1, chapter 4.1.

Significant civil engineering works on the road network

Configuration of the terrain and location of the city at the confluence of two rivers requires rather demanding engineering structures, in particular in case of transport constructions. With the ongoing development of built-up areas, spatial capacity of the territory is exhausted and the existing reserves for transport routes require solutions that are technically and financially demanding.

The most significant transport constructions in the city are the bridges over the Elbe river – the historical bridge of Edvard Beneš, where PT trolleybuses currently operate, and Mariánský bridge. Pedestrian routes lead across both bridges, which link the two parts of the city on opposite banks of the river. Therefore their importance in the urban transport system is inherent. In case of operating failure of both of the bridges (as happened in 2002 during the floods), the city transport is completely paralysed, as the nearest bridge across the Elbe river is located in the city of Děčín (about 24 km from the bridge in Ústí nad Labem).

On the western edge of the territory, several bridge flyovers were established due to the construction of the highway D8. For example, the bridge over the railway lines and the valley in Trmice is about 1,1 km long. Local roads in locations crossing the highway D8 also often required unique bridge solutions. Another relatively unique construction was implemented in relation to the reconstruction of the road II/613 (Žižkova street), which leads in close concurrence with the river Bílina.

Special construction work was designed in the city to improve resistance of the street Přístavní in case of increased water levels of the Elbe river. The flood tub allows traffic to continue to flow on this important street, which is part of the road I/30, even when the river reaches above the street level.

Further bridge construction works are implemented in the city along the railway line in the city centre, where the lines lead above the ground level and the bridge arches are used to allow traffic of vehicles and pedestrians to flow underneath. Despite the solution, the railway lines present a relatively significant barrier in the city terrain. In the city district Krásné Březno, the streets U Podjezdu and U Cukrovaru pass under the railway by underpasses. This technical solution reflects the development of the railway station. The original underpass had a single lane and insufficient height for passage of vehicles. With the expansion of the station, a bridge structure was added to the original underpass to meet the required standard. The original underpasses were not rebuilt. Both roads, however, are only moderately utilised by traffic.

There are no tunnel construction works on the city road network.

There are numerous pedestrian underpasses located under roads and railways on the city territory. The overpasses for pedestrians are currently being gradually removed.

4.2.4.2 PT infrastructure

Almost all parts of the city are currently served by public transport, mainly buses and trolleybuses. Trolleybus routes lead through the major part of the inner city area while buses (which have a supplementary function) serve mainly the outskirts. Connection between the city and the surrounding towns and villages is provided by regional bus services. The link with other cities in the region and more distant areas is ensured by rail services. The city public transport in Ústí nad Labem is not integrated with other public transport modes.

PT lines are operated within the main traffic space on local roads. In the city centre, PT vehicles serve the streets Hrnčířská, Revoluční, Masarykova and Malá Hradební, which are the backbone roads of the city.

Preferential measures for trolleybuses are applied at the traffic light controlled intersection Sociální Péče with Mezní (the preferred direction is left-turn) and further realised by traffic signs in the city centre at Mírové square (entrance prohibited for individual motor transport). In contrast priority measures are not applied for buses, either in the form of bus lanes or priority at traffic signals. Most of the traffic light controlled intersections in the city are utilised by PT vehicles, so during busy hours, the delay to PT services increases.. In terms of passability and delay, the most problematic intersection is at Předmostí, where a PT vehicle must often stop twice before passing the traffic signal.

The most frequented transport nodes with regard to the city PT, are the following stations in the city - Hraničář, Theater, and Main Railway Station. These three stations are also the major transfer points in the city (trolleybus/bus/train).

For more details about PT in Ústí nad Labem, please see the CIVITAS ARCHIMEDES deliverable R39.1.

4.2.4.3 Pedestrian infrastructure

The majority of pedestrian routes lead through the city centre. The main bus station and railway station are located here. Pedestrians head into the city centre for various purposes, such as shopping (mainly at the shopping centre Forum, Labe, Sever or Zdar) or handling official affairs (at the Regional Office of the City, the Municipal Office of the City, the Regional Directorate of the Police of the Czech Republic, Regional Court, etc.). Other common sources and destinations of pedestrian trips are the railway stations, health or school facilities.

Examples of streets with intensive pedestrian traffic are the street Národního Odboje at Střekov (Regional Court), the street Sociální Péče (hospital) and especially streets connecting residential and shopping areas, such as the Krušnohorská, Seifertova or Výstupní street.

The main problems concerning safety of pedestrians occur on the most frequented roads. Clashes with intensive motor traffic can be resolved by controlling the intersections by traffic lights, including the pedestrian crossings, or implementing separated pedestrian crossings

equipped with traffic light signals only for pedestrians. Some problematic spots are also located on less frequented roads, such as roads served by public transport, roads by large shopping centres, sport, school, health or cultural facilities.

4.2.4.4 Cycling Infrastructure

The topographic profile of the city is very hilly and rather challenging for cyclists, which is one of the reasons why a cycling infrastructure has not previously been incorporated into the city's transport system.

The major cycle route in Ústí nad Labem passes on the right bank of the Elbe river (east side). The Elbe cycle route (Greenway trail) follows the river to Germany as Elberadweg cycle route. It is part of the European cycling network EuroVelo, which connects all the European countries by 12 cycle routes. The Elbe cycle route is part of the EuroVelo no. 7 leading to Norway through Finland, Sweden, Germany, Czech Republic (Děčín, Prague, Tábor, České Budějovice), Austria, Italy and Malta. The Elbe route is marked as the cycle route no. 2, registered by the Czech Tourist Club. In Ústí nad Labem, no other cycle route is linked with the Elbe route.

Cycle route no.3090 is located on the left bank (east) of the river and leaves the city by class III road towards Podlešín. Another cycle route situated on the left bank (east) and running parallel with the river, is route no. 3091 leading to and from Vaňov. The Eastern part of the city reaches cycle route no. 3009B, which is located by the Milada lake.

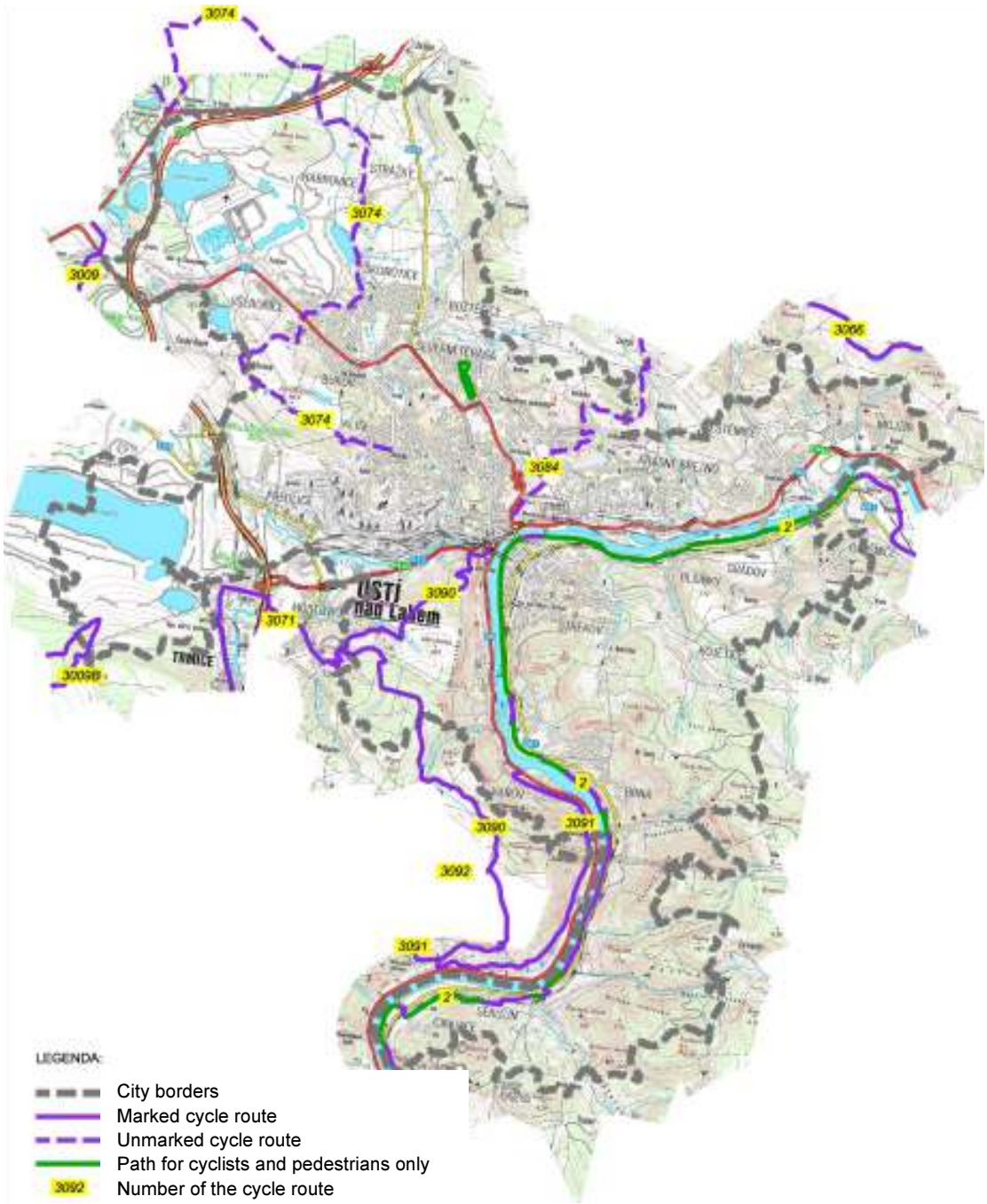
The Czech Tourist Club recorded two more cycle routes in the city, which are not marked. The cycle route no. 3074 begins at the intersection in Klíše, over the Střížovický hill to Střížovice, Všebořice, Habrovice, Bánov and further north towards Telnice. Cycle route no. 3084 enters the city from Žežice, continues to Dobětice, passes the zoo and follows to the street Důlce under the Marianský hill.

Chart 3 – Current cycle routes in Ústí nad Labem

Class	Number	Route	Note
I	2	Dolní Žleb – Děčín Velké Březno – Ústí nad Labem – Libochovany – Litoměřice – Roudnice nad Labem – Štětí – Mělník – Kralupy nad Vltavou – Řež - Praha	The Elbe route continues from Mělník as a cycle route no.24
IV	3009B	Habří - Jedovina	
IV	3074	Ústí nad Labem – Habrovice - Liboňov	unmarked
IV	3084	Mnichov – Žežice – Ústí nad Labem	unmarked
IV	3090	Ústí nad Labem, Větruše – Hostovice – Podlešín - Chvalov – Dolní Zálezly	
IV	3091	Vaňov – Dolní Zálezly – Dubice – Radejčín	

The Elbe cycle route consists of several cycle paths situated in the city (marked green on the map). Other routes dedicated to cyclists and pedestrians only are located in the park in the residential area Severní Terasa.

Picture 1 - Current cycling network in Ústí nad Labem



4.2.4.5 Railway Infrastructure

Ústí nad Labem is an important railway junction of four railway stations (Main station, West station, Střekov and Noth station), through which leads major international connections to Vienna, Berlin, Budapest, Belgrade or Sofia (Balt-Orient). The international backbone route is the national railway line no. 090 (I. rail transit corridor from the state border - Děčín – Ústí nad Labem - Prague - Břeclav – the state border), which is part of the IV. Trans-European multimodal corridor. Currently, the line is under reconstruction and modernization to fulfil parameters corresponding with higher speed of trains and should improve quality of people and goods transport. In the city, inter-regional rail transport, regional urban transport and city public transport will be linked. All Eurocity (EC) and Intercity (IC) trains of European importance stop in the station Ústí nad Labem Main station, which is a major transport terminal for public transport in the Ústí region with about 6 200 passengers transported per day.

4.2.4.6 Water Infrastructure

Ústí nad Labem is situated on an important European waterway. Elbe waterway is connected to the network of western European waterways, allowing access to Germany, the Benelux, northern France and major sea ports. Elbe waterway is part of the IV Trans-European multimodal corridor. Ústí nad Labem offers variety of services for leisure activities on the river but transport on the waterway is restricted by unreliable depths of water for navigation. This should be changed in the future by construction of a navigation level at Děčín, which is proposed in order to improve conditions on the Elbe River in the section between Ústí nad Labem and the state border of the Czech Republic/Germany.

4.2.4.7 Air Infrastructure

In terms of collective passenger and freight air transport, the facilities located closest to the city are the airports in Prague - Ruzyně and in Dresden (Germany). Both destinations are of similar accessibility both by public and individual transport.

Furthermore, there is an airport of local importance located on the western part of the territory. It has a grass runway and is used primarily for sport aircraft. It does not have a potential for commercial development.

4.2.4.8 Cable Way

The cable way in the city was put into operation in December 2010. It connects the shopping area in the city centre with the castle Větruše. The capacity of its cabin is 15 persons, the maximum load is 1125 kg. Operation of the cable way is provided by 2 electro-motors, each with the output of 45 kW at 1480 rpm. The maximum driving speed is 6 m/s. The cable way can transport 390 persons/hour. The journey time is 1,5 minutes.

4.2.4.9 Parking Infrastructure

The city centre of Ústí nad Labem offers parking places on roadways (parallel, perpendicular, diagonal), car parks and parking garages. Parking places can be divided into facilities open to the public and private facilities (on private land, in gardens, individual garages, etc.). In addition, in parking areas open to the public we distinguish between paid and unpaid facilities.

The total of the established number of individual parking places is shown in the following table:

Figure 40 – Parking capacity identified by the survey

		paid	unpaid	reserved
parking on roadways	parallel	271	198	53
	diagonal	179	57	15
	perpendicular	146	77	61
car parks		270	42	428
parking garages		893*	0	768*
Total		1759	374	1325
		2133		
individual	yards, gardens	281		
	garages	225		
total		506		
Total parking places		3964		

The southern side of the city centre is close to the River Elbe. Parking is possible in the streets on the right river bank. Walking distance to the centre is about 1 km across the bridges, which is rather long.

To the east of the centre there is an industrial park with most parking places reserved for local businesses. A few places can be found in U Chemičky Street and Brněnská Street and in U České besedy Street, although here it is nearly impossible to find a parking place.

North-west of the centre are residential neighbourhoods. Parking is not regulated in the streets but the demand of the residents for parking is rather high and the available parking capacity does not meet local needs.

North of the centre is a residential neighbourhood with single-family houses and tower blocks. The parking capacity does not fully meet the needs of residents.

The Mariánská Rock (an important landscape object) is situated east of the centre and it does not offer any capacity for parking or traffic.

Parking options in the close vicinity are considerably limited as there are insufficient parking places even for residents living here. Parking further from the city centre and travelling to the centre by PT is possible. However, it is rather complicated to find a parking place in more

remote locations because they are usually densely populated and the parking deficit is critical.

For more details about parking in Ústí nad Labem, please see the CIVITAS ARCHIMEDES deliverables T25.1 and R25.1.

4.2.5 Current Transport Telematics

Management system and road traffic organization includes light signalling and variable traffic signs.

4.2.5.1 System of Traffic Management via Traffic Light Signals

Intersections with intensive traffic in the city, and locations, where it is appropriate in terms of road safety, are equipped with traffic lights. All implemented traffic light devices allow dynamic traffic management, depending on the actual traffic situation. One device allows preference of trolleybuses (intersection Sociální péče with Mezní) and seven devices are coordinated to provide sequential green light signals. The traffic management system realised by traffic lights includes camera surveillance system, which provides video-information on traffic from the relevant light-controlled intersection. The video message is transmitted to the monitoring centre of the traffic light administrator and to the Police of the Czech Republic in Řehlovice.

Another utilised technology is priority for the Integrated Rescue System on intersections. This system enables the rescue vehicles equipped with a radio transmitter to send a signal for priority passage on the relevant intersection. The device detects the direction of the rescue vehicle and the controller subsequently engages green light phase for this direction and red light phase for other directions.

The controllers of the traffic lights are equipped by basic logic that allows the signal plans to be adapted to the current transport situation. In case of less frequented periods, they reduce the time delay of vehicles at traffic light controlled intersections.

The following three basic algorithms are applied for management of traffic light devices:

1) A fixed sequence of phases with possible extension of phases (dynamic management) and insertion of the phase for pedestrians based on request (button for pedestrians at a pedestrian crossing);
2) Permanent green phase in the main direction with possible phase for pedestrians and extension of phases;
3) Permanent red phase with possible phase for pedestrians and extension of phases (usually for night traffic).

Coordinated management of traffic lights is achieved either through coordination of the length of the cycle based on the cycle length of the overall group controller or based on dynamic coordination. For dynamic coordination, the order and length of the phases of traffic lights adapt, based on impulse of the group controller.

4.2.5.2 Traffic Management System Realised via Variable Traffic Signs

In Ústí nad Labem, variable traffic signs are installed on the street Přístavní (road I/30). It allows changes of traffic organisation in case of emergency, such as floods or torrential rains. The system is part of the flood tub. The variable traffic signs can divert traffic and announce closures of the street Přístavní in the section between the traffic light controlled intersections Pražská with Přístavní and Přístavní with Hrnčířská. In case of a closure, traffic is diverted by directional variable traffic signs into the streets Žižkova and Hrnčířská. The closure is realised via prohibiting variable traffic signs and via electrically operated gates with light signals. In case of a closure, controllers of traffic light devices respond by switching from the normal sequence to the blinking yellow mode. Closure of the particular section is activated either automatically, based on the impulse of the water level sensor in the water-pumping station of the flood tub, or remotely, based on the input from the Municipal Police station, where the control terminal and visualization of the management for variable traffic signs is located. It is possible to perform closure locally by two manual controllers located in streets Přístavní and Hrnčířská. The section is monitored by the cameras of the NTD Group and Police of the Czech Republic, and by city surveillance system of the Municipal Police. In case of emergency, variable traffic signs can be also utilised for closures due to different reasons, for example due to large traffic accidents.

For more details about traffic management in the city, please see the CIVITAS ARCHIEMDES deliverables R26.1 and T26.1.

4.2.6 Current Transport Services

4.2.6.1 Public Transport

Almost all parts of the city are currently covered by public transport. Buses and trolleybuses cover most of the major transport links. Connection of the city with surrounding municipalities is provided by regional charter buses. Other cities and more distant areas are linked by the railway network. Individual modes of public transport are not yet incorporated into an integrated transport system (ITS).

Charter Buses

Charter buses ensure the connection of Ústí nad Labem with the surrounding towns. Although, the number of passengers transported to and from these areas is significantly smaller than the volume transported by the city public transport, the importance for the accessibility of the city from the surrounding areas is crucial. For long distance transport, charter buses have only supplementary function, whereas the majority of transport is realised by the railway system.

The main transfer points between the regional bus transport and railway transport are at the following stations: UL Main bus station, UL Main railway station and UL West railway station.

Railway Network

The Ústecký region has the densest railway network in the Czech Republic. Within that, Ústí nad Labem is an important railway junction with four railway stations serving major international connections Berlin-Vienna and Berlin-Budapest-Belgrade-Sofia (Balt-Orient). The 1st transit railway corridor leads from the state border to Děčín – Ústí nad Labem – Praha – Břeclav to the state border as a part of the 4th trans-European multimodal corridor. The city is served by passenger trains (motorised and electric), rapid trains, express trains, EuroCity, InterCity and EuroNight.

City buses and trolleybuses

City public transport achieved by buses and trolleybuses is the only kind of transport under the powers and regulation of Ústí nad Labem statutory city. The City is the sole shareholder of Ústí nad Labem Transport Company. Other modes of public transport are under the jurisdiction of the Ústí region.

For more details about about public transport in Ústí nad Labem, please see the CIVITAS ARCHIMEDES deliverable R39.1.

4.2.6.2 Logistics

With the historic existence of industrial production and storage sites in the city, ports, docks and, moreover, with construction of new business centres in Ústí nad Labem and its surroundings (e.g. 30 kilometres from the city, there is one of the largest logistic terminals – Lovosice), the share of freight traffic in the territory is increasing, which strongly affects traffic in the city and which encourages the search for new ways of addressing the negative effects of freight traffic in the city.

Freight logistics must satisfy needs of the city in terms of supply and, at the same time, avoid unnecessary traffic passing through the city. Negative impacts of freight transport should be limited by completion of the Highway D8, construction of a large-capacity road I/13 connecting the Highway D8 and Děčín, but also with completion of connection roads of tangential type enabling to detour the city centre. Unfortunately, such necessary bypass routes outside the transit sections of the city and, in addition, also connected to major sources and destinations of freight transport (production, trade, docks, ports, etc.) are currently neither available nor planned.

The city of Ústí nad Labem is actively dealing with freight traffic as a whole, but does not yet have a comprehensive policy on freight transport in the city, which is one of the major issues in planning the future development of transport in the city.

For more details about logistics in Ústí nad Labem, please see the CIVITAS ARCHIMEDES deliverable T67.1.

4.3 Prognosis of Future Mobility

More than 60% of the population in the EU lives in cities, which generate almost 85% of total GDP. Therefore, cities are an important source of employment and economic development. Employment opportunities, education, shopping, culture and social services facilitate significant links with the city surroundings and thus transport demand. Cities are centres of housing, education, services and shopping opportunities where it is necessary to maintain a high quality of life. Without a functional and economic transport system, there will be a limited economic development for the entire city society.

4.3.1 Prognosis of Mobility of Inhabitants

For the analyses of needs of transport users and establishing a long-term vision of transport development in the city, the following main socio-economic trends influencing transport were taken into consideration:

- growth of GDP and the living standard of citizens
- development of motorization rate
- continuous globalization and economic integration in the EU
- increasing immigration to the EU
- aging of population
- continuous urbanization and suburbanization
- environmental protection
- technological progress

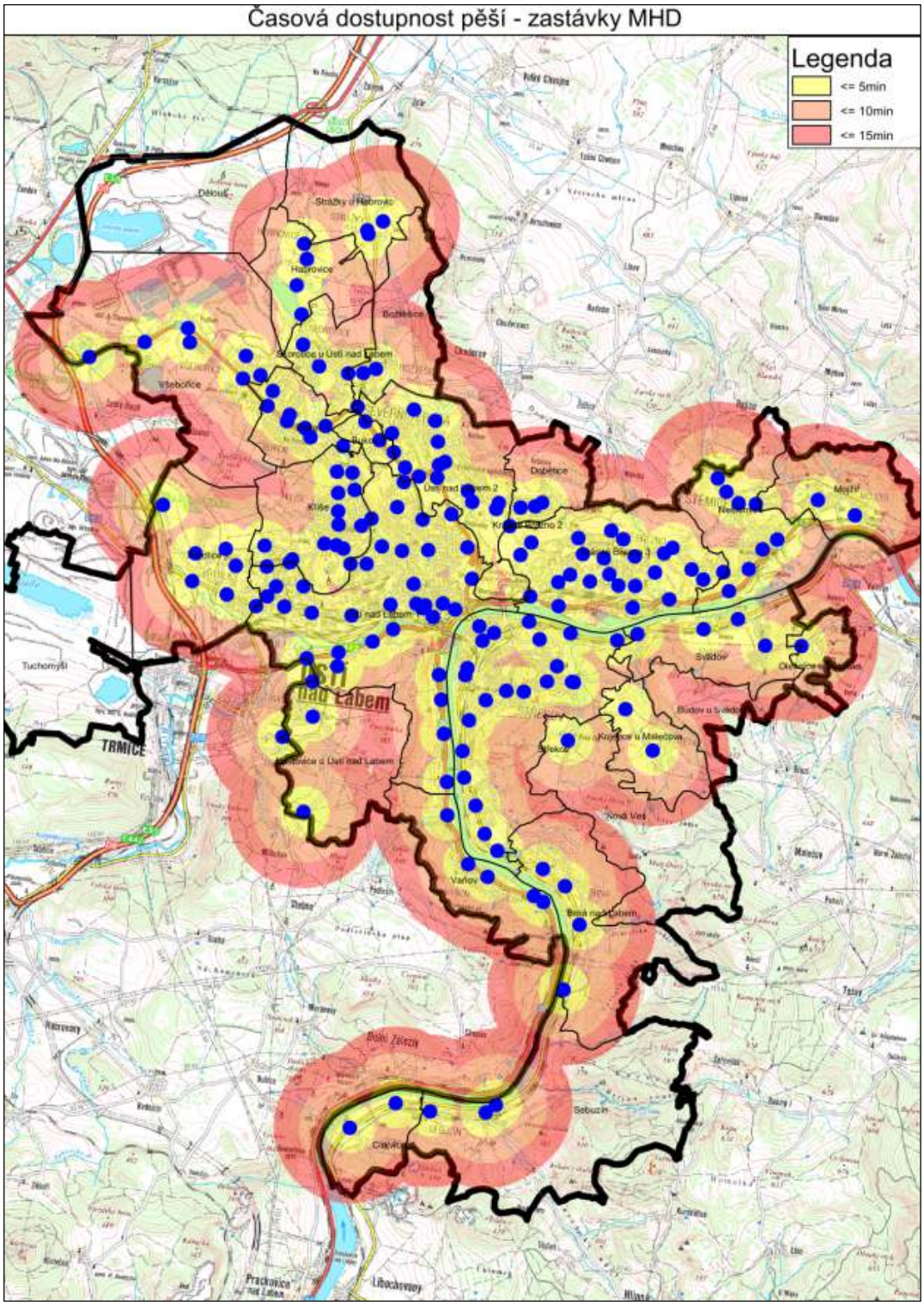
Another important factor is transport accessibility, influencing quality of life in the city, potential development of the area, its economic activities and functions of the city.

Accessibility is graphically presented on two types of maps:

- Isochronic maps showing transport accessibility according to time consumption
- Isochoric maps showing transport accessibility according to the distance

For Ústí nad Labem, accessibility was examined from the perspective of a transport mode and a destination of transport. Based on the analysis, quality of transport services in the city was assessed for car transport, cycle transport, public transport and for pedestrians.

Figure 5 – Time accessibility for pedestrians from PT stations in Ústí nad Labem (current state, year 2011)



For sustainable development of city mobility, it is essential to optimise usage of available transport modes and their combinations. The important parameter of mobility is the urban structure of a city. The usual mobility distance of people from their homes is the following:

- work 5 – 30 km;
- basic schools 1 – 5 km;
- vocational schools and universities 5 – 30 km;
- shopping 1 – 10 km;
- health care 2 – 20 km;
- daily recreation 1 – 5 km;
- services 5 – 40 km;
- business trips 20 – 150 km;
- weekend recreation 20 – 100 km;
- holidays 150 – 600 km;
- exotic vacation 1000 – 10 000 km.

These distances differ according to social conditions and individual preferences and the needs of different transport users. Distance, price and accessibility are the main factors for transport mode selection.

Selection of individual transport modes also vary in distance. Typical values are shown in the following list:

- Pedestrian transport 500 m – 5 km;
- Cycle transport 1 km – 15 km;
- City public transport 1 km – 20 km;
- Intercity buses 3 km – 30 km;
- Regional rail transport 3 – 50 km;
- Coach transport 30 km – 1000 km;
- Long-distance rail transport 50 – 2000 km;
- Car transport 2 km – 1000 km;
- Air transport 500 km – 10 000 km.

Selection of transport mode has its limitations, depending largely on habits of users. It cannot be expected that the transportation scheme will drastically change in the city.

4.3.2 Development of Motorisation

Transport policy in the past had as a single goal the provision of transportation infrastructure. Parking of vehicles was not anticipated with sufficient capacity for the actual development in the level of car ownership. Since the year 1989, there has been a sharp increase in the number of passenger cars owned by inhabitants. Currently, the transport infrastructure in the city is not adequate for the existing transportation demand. As a result of insufficient transportation supply, the negative impact of transport on the city environment and living functions is immense. This is particularly problematic in the city centre and in residential areas.

Comparison of the level of car ownership (personal cars per 1000 inhabitants) and the level of motorization (all vehicles per 1000 inhabitants) is presented in the following table.

Table 1 – Level of motorization and automobilization on 31st December 2010

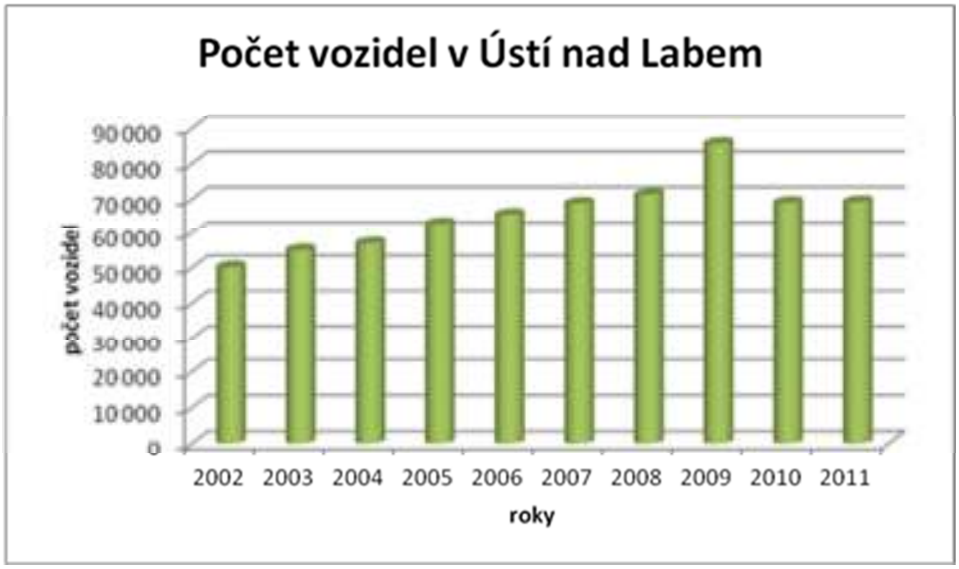
(31.12.2010)	No. of personal cars	No. of all vehicles	No. of inhabitants	Level of car ownership [veh/1000 inhab.]	Level of motorisation [veh/1000 inhab.]
ČR	4 496 232	7 221 943	10 532 770	426,88	685,66
Prague	649 707	939 071	1 257 158	516,81	746,98
Ústí region	341 806	533 948	836 045	408,84	638,66
Ústí nad Labem district	47 924	71 732	121 699	393,79	589,42
City of Ústí nad Labem	-	69 014	95 464	-	**722,93**

Source: Database of the Central Register of Vehicles (Ministry of Interior of the CR), the Czech Statistical Office and the Municipality of Ústí nad Labem

It can be concluded that the level of car ownership and motorisation in the city of Ústí nad Labem is high, above the national average, close to the value of the capital city of Prague.

The following table illustrates development of vehicles operated in Ústí nad Labem. There is a clear rise until the year 2009. In this year, a large number of old vehicles were decommissioned, which is reflected by the decline in the following years. From 2010 to 2011, there was only a slight increase by 243 vehicles.

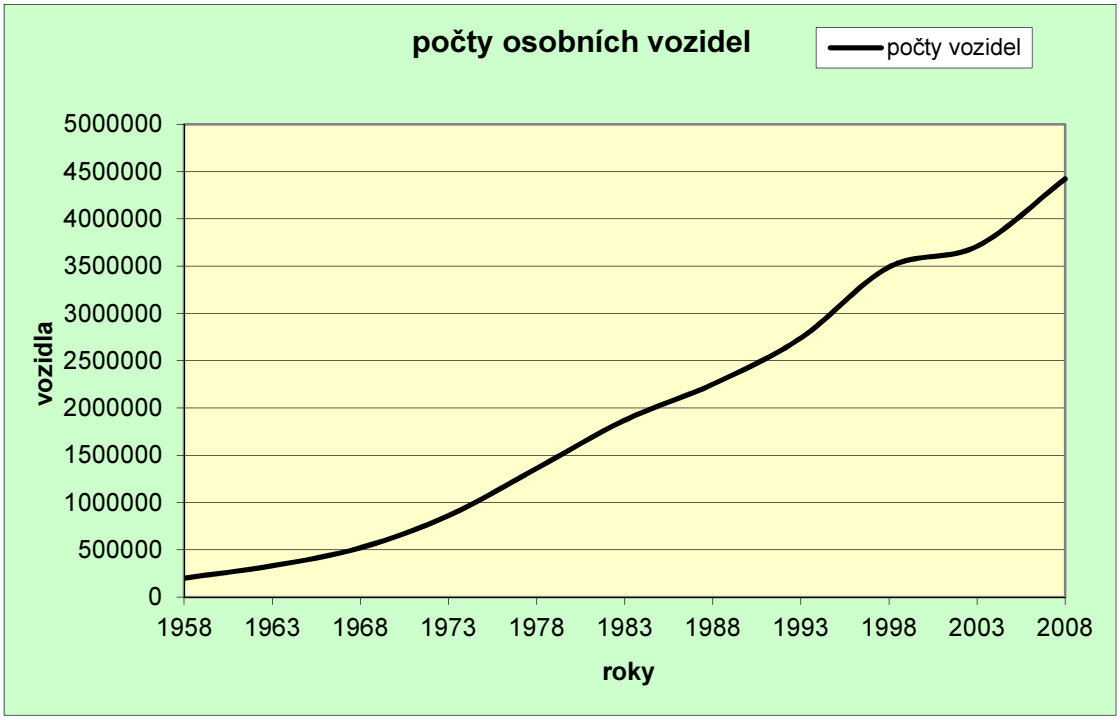
Graph 2 – Number of vehicles operating in Ústí nad Labem



Source: Municipality of Ústí nad Labem, Department of Transport (Statistics of the Register of Vehicles)

In order to reliably estimate the development of car ownership in the city, a sufficiently long source of continuous data must be available. For Ústí nad Labem, where such data are missing, the nationwide prognosis using data since 1958 was applied on the city. However, these national data are collected only once in five years and therefore the most up-to-date data are from the year 2008.

Graph 3 – Development of the number of personal vehicles in the Czech Republic



Source: Database of the Central Register of Vehicles (Ministry of Interior of the CR)

The curve decreases between the years 1998 – 2003. This was caused by the Act on compulsory insurance of vehicles for legal liability, when more than 100 000 cars were removed from the register.

It is very unlikely that the development of car ownership in Ústí nad Labem would significantly differ from the average development in the Czech Republic. Therefore, the prognosis was based on this forecast.

The register of vehicles provides the following numbers for the district of Ústí nad Labem:

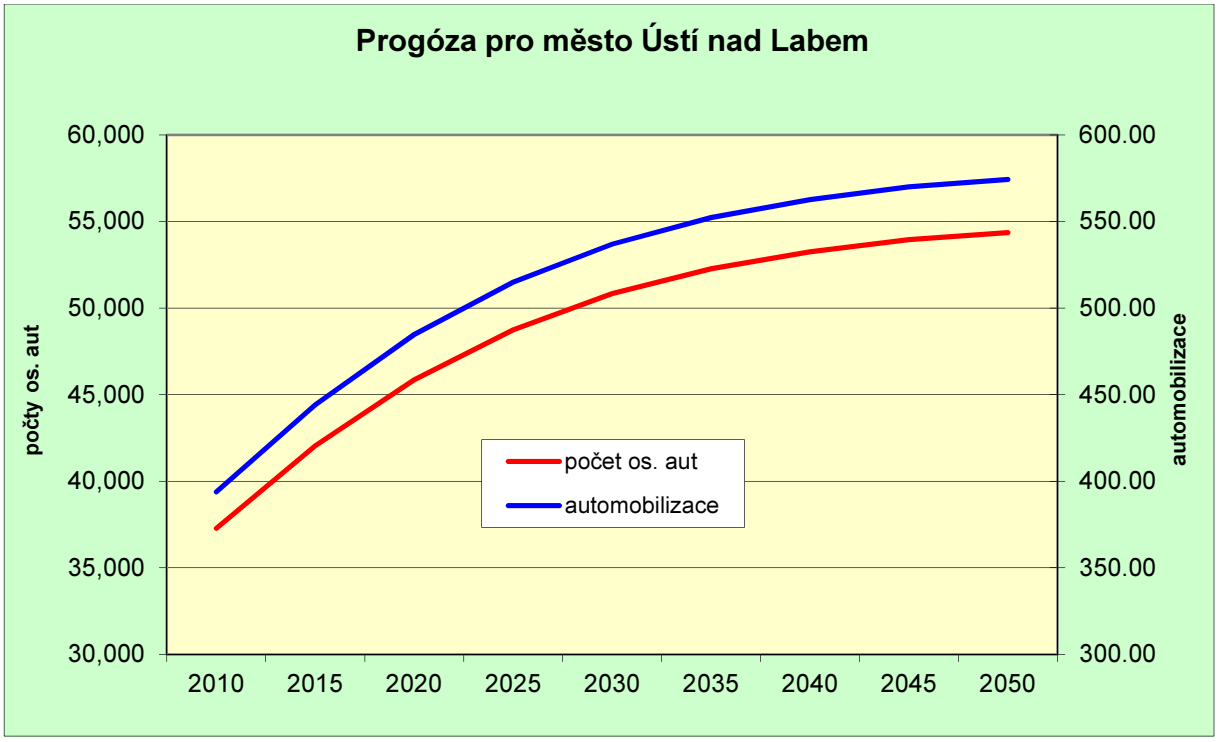
- Number of registered personal vehicles in the districts = 47 924
- Number of inhabitants in the district = 121 699
- Number of inhabitants in the city of Ústí nad Labem = 94 646
- Level of car ownership in the districts = 394 personal vehicles per 1000 inhab.

With certain uncertainty it can be stated, that the level of car ownership in the district is the same as in the city of Ústí nad Labem (where it is a little bit higher).

Table 2 – Prognosis for development of the no. of vehicles in Ústí nad Labem

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Car ownership	393,79	444,20	484,56	515,00	536,94	552,24	562,67	569,97	574,32
No. of personal vehicles	**37 271**	**42 042**	**45 862**	**48 743**	**50 819**	**52 267**	**53 254**	**53 945**	**54 357**

Graph 4 – Prognosis for development of car ownership (blue line) and the number of personal vehicles (red line) in Ústí nad Labem



From the level of car ownership, further traffic data can be derived. The Directorate of Roads and Highways of the Czech Republic states that the average operation of a car is over 9 000 km per year. This was used for determining traffic load in the city in vehicle-kilometres.

4.3.3 Prognosis of Future Traffic

4.3.3.1 Prognosis for Future Traffic Intensities

Traffic prognosis for the city of Ústí nad Labem was enumerated for the time horizon of the year 2040. Development of the transport infrastructure and the territory is based on actions defined in the Master Plan of the city. For all the developing areas in Ústí nad Labem, new transport zones (389) were assessed by the traffic model of the city in terms of generated traffic based on size and potential usage. The matrices of transportation relations of the Czech Republic were obtained by adding coefficients of growth for relevant years to the existing calibrated matrixes. The foreseen increase of traffic intensities is the result of increasing coefficients of growth for the period between 2005 – 2040. These data were gathered from the Transport Journal No 9/2007, Annex C – Basic data for calculation of economic efficiency of road and highway constructions within investment projects of the Czech Republic, and processed by the program HDM-4 with data calibrated with the Czech System of Evaluation of Roads *(ČSHS)*.

The predicted traffic intensities are influenced not only by the overall increase in the volume of trips caused by development of the territory, but also development of the transport

network. Putting into operation new infrastructure, such as the missing highway in the city vicinity and important I class roads, may result in significant changes of traffic intensities in the area. Due to the fact, that the traffic mode of the city is based on background data of the national model, it is possible for calculations of traffic intensities in the city to take into account changes caused by development of the transport network throughout the Czech Republic.

For the year 2040, the traffic model assumes a completion of all highways and I class roads on the transport network of the Czech Republic planned by the Directorate of Roads and Highways. In the Ústí region, this covers primarily completion of the highway D8, speedway R6 and R7, relocation of the I class road I/13 in the section D8 – Děčín – Česká Lípa, the bypass of Bílina and Kladrubská connection. On the territory of the city of Ústí nad Labem, the range of completed transport network is considered in in the following two variants:

1) **Zero scenario** – no development of the transport infrastructure in the city
2) **Active scenario** – the transport infrastructure is developed by projects described by the Master Plan of Ústí nad Labem, adopted in December 2011.

The active scenario involves implementation of the following structures for motor transport:

- relocation of the road II/528 west from the town Strážky
- connection of the streets U Trati and II/613 (Žižkova)
- connection and a roundabout at the street CPI Krásné Březno
- tunnel at the street I/30 (Sociální péče)

For both variants, the foreseen traffic load was calculated for all vehicles, light freight vehicles, heavy freight vehicles and buses per 24 hours and graphically presented on maps attached in the annexes of SUTP. on the communication network, which is displayed in graphical annexes in all vehicles/light goods vehicles (up to 3.5 t)/other freight vehicles (above 3.5 t), including the public transport buses for 24 hours. In addition to the cartograms of the absolute intensities of differential cartograms were constructed that show increases and downturns always between two intensities compared variants.

4.3.3.2 Prognosis for Future Modal Split

Modal split depends on many factors. Some of them can be directly influenced by local authorities and transport managers, some of them are beyond city, regional or national boundaries, such as global development of economy and standard of living.

The only regular comprehensive survey of population mobility available in the Czech Republic is the census of people, houses and apartments, containing also data on commuting (to work, school, etc.). However, this survey does not cover all trips in the city, such as trips for vacation and leisure time activities. Modal split is then determined on the basis of different source data gathered with different approaches, which results in significant differences between the values. An exact determination of modal split is thus not possible and requires an extensive socio-demographic survey of population and transport relations.

The prognosis of modal split in the SUTP was based on main determinants described below, which influence decision-making in territorial and transport planning.

The main factors considered for prognosis of modal split were the following:

- Functional land use and spatial planning
- Financial costs and time consumption of transportation
- Comfort and safety of a transport system
- Available transport systems and infrastructure
- Parking opportunities
- Accuracy and reliability of a transport system
- Configuration of the terrain, climate / weather conditions
- Standard of living of the population
- Image of a transport system
- Clarity, accessibility, quality of information of a transport system
- Available alternatives
- Attractiveness and safety of a transportation route

Based on the determinants, the following basic scenarios of modal split development in Ústí nad Labem were defined, based on activities realised by the city:

1. **Eco–friendly scenario** – requires significant efforts to increase share of cycling (both for recreational and commuting purposes) and walking, improval of PT services to maintain or increase usage of public transportation and restrictiions of individual motor transport. The scenario considers major investments, strong political support and dedicated activities of decision makers.
2. **Conservative scenario** – considers efforts to maintain the existing level of PT usage, slow but continuous growth of recreational cycling and pedestrian activities, restricting growth of car usage, sufficient political support, significant investments and mild restrictions for individual motor transport.
3. **Post-analogic scenario** – based on the existing development and in analogy to development in western cities in past decades, with no efforts towards sustainable transport, significant decrease of PT users, certain growth of recreational cycling and significant growth of car users is expected.

The conservative scenario is most likely to be achieved in the long-term. The existing development currently reflects the post-analogic scenario and, with no efforts to change the situation, this passive scenario is realistic. The eco–friendly scenario is optimistic and can only be achieved with continuous efforts.

This prognosis does not constitute a reflection of desired achievements, but forecasts realistic development of modal split in accordance with set objectives and expected trends at local and global level.

Table 3 – Number of trips realised in the city per day for individual model scenarios

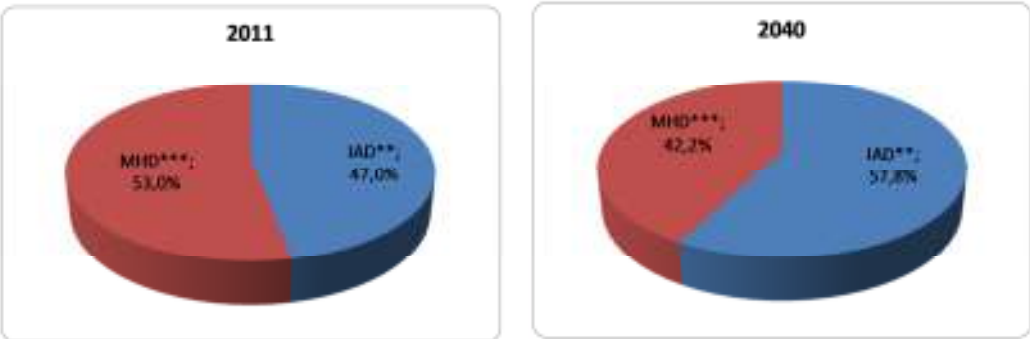
	No. of trips per 24 hours			Modal split			
scenario	**IAD***	**IAD****	**MHD*****	**IAD***	**MHD*****	**IAD****	**MHD*****
2011 - current state	156817	108280	121979	56,2%	43,8%	47,0%	53,0%
2040 - zero scenario	240651	167274	121979	66,4%	33,6%	57,8%	42,2%
2040 - active scenario	240651	167274	121979	66,4%	33,6%	57,8%	42,2%

**inner-city transport (without transit traffic) with its source or destination in the city*

*** inner-city transport (without transit traffic) with both its source and destination in the city*

****PT trips from their source to their destination (including transfers if relevant)*

Graph 5 – Modal split presented in trips realised by PT (red colour) and by cars (blue colour) in Ústí nad Labem – current state and prognosis for 2040



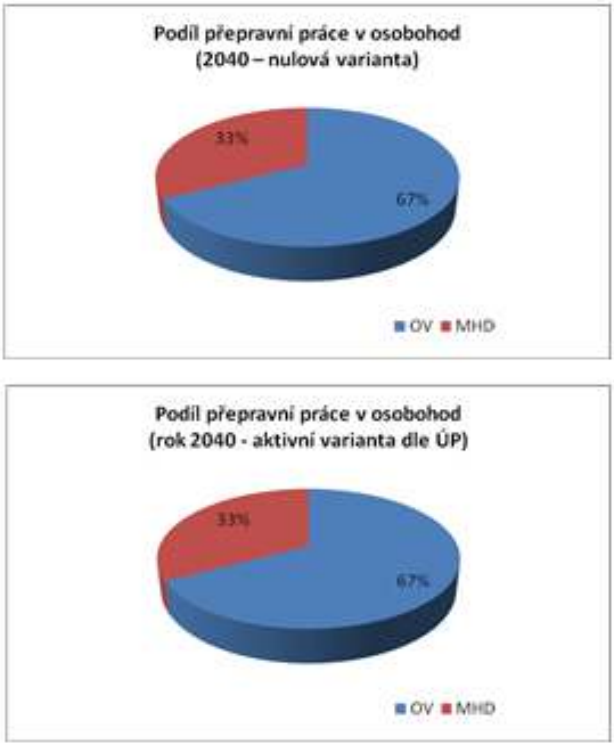
Source: calculated by the traffic model of the city

Forecast modal split divided by vehicle categories was determined from the transport model of the city. Transport model calculations were targeted to the year 2040 in three basic categories of vehicles (cars, light freight and heavy freight vehicles) and a special category for PT vehicles.

Calculations of traffic load were performed assuming completion of the strategic transportation network (including completion of the highway D8 passing the city, main roads R6, R7 and relocation of the road I/13 towards Děčín) and other important roads influencing transportation in the area (such as the motorway D3 or the R35).

Graph 6 – Modal split in traffic performance (vehkm) for the active variant based on the Master Plan of the city (blue-cars, red-light freight, green-heavy freight, purple - PT)

Graph 7 – Modal split in traffic performance (vehkm) for comparing the zero variant with the active variant (red-cars, blue-PT)



4.3.3.3 Prognosis for Transit Traffic

With completion of missing transport infrastructure, primarily the highway D8 passing the city, intensity of transit traffic will be significantly reduced, considerably decreasing the volume of vehicles mainly in the street Žižkova and the road I/30. The most significant transit flows are in the future foreseen to take in the direction east - west (by roads II/613 and I/62, or II/613 and II/261) and on the left bank of the Elbe River in the north - west direction to/from Děčín.

Prognosis is calculated for zero and active variant for the year 2040.

4.3.3.4 Prognosis for Congestions

Occurrence of traffic congestion, especially during rush hours, is caused by insufficient capacity of intersections, mainly in the city centre. In order to reduce such congestion, it would require radical reconstruction of roads in the area or implementation of strict restrictions for motor transport in the city centre, which is more realistic solution. However, restrictions for cars should be accompanied by providing suitable alternative routes to avoid shifting the problem to other sensitive areas in the city.

Moreover, due to its landscape segregation, the city lacks a suitably interconnected transportation network. Major traffic flows are thus accumulated in few corridors, the capacity of which is already exhausted.

Congestion will be even more frequent in the future with growing traffic intensities. Delays currently occurring during peak hours will be extended also to other times of day and can in some cases completely paralyse transportation in the city. In the existing state, congestion also has an impact on public transport, reducing its attractiveness for users. Such scenarios should be prevented and the missing infrastructure connections should be completed.

4.4 Solutions and Recommendations for Sustainable Urban Transport Development

The chapter addresses issues and shortcoming of individual fields of transport in the city identified in the analytical chapter and, primarily on the basis of research and feasibility studies elaborated within the CIVITAS ARCHIMEDES projects, provides solutions and recommendations for improvements of the current state towards more efficient traffic management and sustainable development.

4.4.1 Sustainability

The chapter describes principles of sustainability in transport development and applications for the city. It presents conditions, which need to be met to achieve sustainable development of transport and goals of such development. It gives overview of main anticipated risks and tools suitable for implementation. It involves support of public transport, cycling and pedestrians, elimination of conflicts with motor transport, optimisation of traffic management and application of ITS, development of calm zones and traffic calming, modernisation of the fleet and equipment and support of alternative fuels. Specific recommendations are addressed in related action plans of the SUTP.

Sustainable development of urban transport requires integration of four basic elements:

- people in the city
- public bodies
- economy
- environment

Issues of sustainable transport are not only technical (providing good quality transport infrastructure and development of facilities), but also relates to socio-economic issues. . Public funds into transport infrastructure and transport services offer significantly affect transport, and therefore future social benefits and costs of transport. The main parameters that affect the sustainability of the transport level are quality and structure of transport supply.

Sustainable transport should meet the following criteria.

It is necessary to achieve balance among:

- production and consumption
- economy and environment
- development and protection

The efforts are targeted primarily to:

- pedestrians
- cyclists
- children
- other vulnerable people in the city (such as mobility impaired passengers, etc.)

Development of transport must focus on mitigation of negative impacts of transport on the city environment and quality of life, eliminating mainly:

- noise
- vibrations
- emissions (CO_2, CO, NOx, particulates, etc.)
- congestion
- barriers on access routes
- safety risks

The aims of the efforts are:

- improved living environment
- greener city
- energy savings
- improved mobility
- increased safety of all transport users

Overview of tools for sustainable transport development:

- change of modal split from individual car transport to public transport and non-motorised transport
- development of PT services
- elimination of conflicts of individual transport modes
- efficient traffic management
- implementation of calm zones
- development of cycling and walking modes
- application of greenery and rest areas in the city
- modernisation of vehicles fleet
- usage of alternative fuels

Utilisation of alternative fuels involves propane-butane (LPG), natural gas (CNG), electricity, biodiesel, hybrid engines, and hydrogen propulsion. Currently, the most broadly utilised alternative fuel used is electricity and gas.

Effectiveness of application of selected tools for sustainable development depends on numerous factors, primarily individual preferences of users, their social level and other personal characteristics, their ability to use alternative modes of transport, habits etc. In order to regulate transport behaviour, suitable strategy must be applied together with ensuring highest possible public awareness.

4.4.2 Transport Infrastructure Improvements

The chapter deals with solutions designed to improve individual modes of transport and it describes specific proposals and reasoning for their implementation.

4.4.2.1 Development of Road Transport

Main issues:

- increasing car ownership, intensive traffic, increasing negative impact on the environment
- insufficient capacity of the road network, congestions mainly in the city centre
- transit traffic passing through sensitive parts of the city
- absence of appropriate bypassing routes

Recommendations:

- reduction of individual motor transport, development of PT
- completion of the D8 highway and leading transit traffic away from the city
- elimination of unnecessary traffic
- improved traffic management
- regulation of freight transport
- reduction of negative impacts of motor traffic
- interconnection of communication tools
- diversion of traffic load from sensitive parts of the city
- promoting and improving public transport and non-motorized modes
- restrictions of individual cars (parking fees, entrance payments to the city centre, P&G facilities, emission zones, pedestrian zones, etc.)
- increasing traffic capacity and safety of intersections
- addressing specific shortcoming identified in the analysis
- reconstruction of local roads, bridges, underpasses and tunnels

Specific steps required for implementation are described in the Action plan for improvements of traffic flow in Ústí nad Labem.

4.4.2.2 Development of Rail Transport

Main issues:

- outdated equipment and technology

Recommendations:

- reconstruction and modernization of railway lines and stations in the city
- establishing suitable conditions for implementation of high-speed trains (mainly enlargement of the curve radius of railways)
- reduction of excessive tracks

4.4.2.3 Development of Water Transport

Main issues:

- insufficient conditions for navigability of the river Elbe due to unreliable depth

Recommendations:

- improving conditions for shipment of goods on the Elbe waterway
- improving conditions of water transport for leisure and sport navigation
- developing conditions of the waterway for water transport

4.4.2.4 Development of Air Transport

Main issues:

- Low capacity of the airport

Recommendations:

- Maintain operation of the airport and its usage for small aircrafts

4.4.2.5 Development of Public Transport

Main issues:

- high intensity of motor traffic restricting operation of public transport
- old vehicle fleet
- poor condition of PT stations
- lack of financial resources for modernization
- absence of integrated public transport services

Recommendations:

- transfer of users from personal cars to PT through restrictions for drivers
- integration of PT services
- improvements and modernisation of PT services
- implement priority for PT vehicles on intersections

- development of PT services – improve time coordination, adopt supply to demand, operate low-floor modern vehicles, optimise operation of PT lines, increase share of electrified vehicles (shift from buses to trolleybuses)
- apply physical modifications of the road network to provide priority for PT vehicles
- improve cooperation of separate public transport operators
- increase connections to the railway transport in the city

Individual steps required for implementation are described in the Action plan for public transport improvements.

4.4.2.6 Organisation and Regulation of Parking

Main issues:

- lack of parking space, especially in residential neighbourhoods with dense housing
- low territorial reserve
- parking demand exceeding parking supply
- vehicles parked everywhere in the streets, also in violation of the law

Recommendations:

- parking regulations in the city, introduction of paid parking zones and restrictions for motor traffic
- implementation of large capacity collective parking areas at the edge if the city centre (P&G system)
- optimise usage of the existing parking spaces
- efficiently use available street space (perpendicular or inclined parking, one-way traffic, parking on both sides, etc.)
- Implementation of additional collective garages where mostly required

Individual steps required for implementation are described in the Action Plan for parking improvements.

4.4.2.7 Development of Pedestrian Transport

Main issues:

- Intensive motor traffic in the city, mainly in the city centre and residential areas, with negative impact on pedestrians
- poor quality of pedestrian routes
- poor maintenance of public spaces
- lack of financial resources

Recommendations:

- Improving conditions of pedestrian routes (construction of new routes, improving safety of routes, sufficient maintenance, etc.)
- Providing barrier-free routes for pedestrians with mobility restrictions (parents with strollers, seniors, disabled people, etc.)

Individual steps required for implementation are described in the Action Plan for mobility improvements.

4.4.2.8 Development of Cycle Transport

Main issues:

- lack of cycling infrastructure and equipment
- hilly terrain difficult for cyclists
- intensive motor traffic and absence of dedicated routes for cyclists

Recommendations:

- achieve continuous and developed bicycle network in the city, linked to the major cycle routes in the region and to main points of interest in the area
- promotion of cycling and involvement of citizens in cycling activities
- offer services and facilities for cyclists
- increased safety of cyclists on local roads
- support the development of cycling for everyday use
- Create a space and the gradual establishment of a continuous network of bike trails, bike trails and associated equipment linked to surrounding communities and major cycling destinations in the region
- Providing financial resources for the development of cycling, with the help of regional and municipal budget and EU funds
- Provide adequate opportunity for cycling
- Contribute to improving the environment and tourism development
- Provide the public the opportunity to participate actively in the implementation of cycling policies and development of information and services for cycling.
- ensuring sufficient funding for development of cycle transport
- provide opportunities for cyclists
- contribute to environmental improvements and development of tourism
- involve citizens in cycling activities and development of cycling policy in the city

Individual steps required for implementation are described in the Action Plan for cycle transport improvements.

4.4.3 Telematics

Currently, traffic on local roads has reached such a level that it is necessary to address issues of sustainable development and seek complex transport solutions for the city. The possibilities offered by construction of the new transport infrastructure are limited and the trend in the development of motor transport requires application of regulatory measures. Moreover, specific suitable alternatives and new opportunities must be developed. One objective of the city is aimed at regulation and segregation of motor transport in order to avoid safety risks for the population and to limit emission of harmful gases, noise and vibrations. It furthermore deals with priority for public transport (PT) and support of walking and cycling modes and also promotion for quality and cleaner life in the city.

The City of Ústí nad Labem has a target to develop a strategic traffic management strategy and implement measures to restrict traffic in the city centre. The goal is to improve traffic flow in the city and reduce the environmental impact of traffic.

Within the CIVITAS task 11.3.4, analysis of the current traffic management in the city of Ústí nad Labem was conducted. It describes in detail the architecture of the existing transport subsystems and their mutual integration and communication, which is not optimal and is often realised via telephone connections of operators of individual subsystems. Data transfer is neither rapid nor complete. Therefore, information may not be available to all or to some of the subsystems of traffic management in required time.

Given the large number of separate subsystems for traffic management, road maintenance, PT operation, parking management, management of the Integrated Rescue System, etc., and their problematic interconnection, the proposed solution for strategic traffic management in Ústí nad Labem was not based on the existing architecture of management systems. The reason was particularly the problematic sharing of traffic information, which optimisation would require significant investments and technological and organizational changes.

The more effective solution is to change the entire traffic management system, which would enable integration of all the existing subsystems and continuous real-time sharing of information. Development of the solution is processed in detail in the CIVITAS task 3.8 Strategic Traffic Management.

For more details about the current state of traffic management in the city, please see ARCHIMEDES deliverable R26.1.

Main issues:

- transport issues require complex solution covering all field of transport in the city
- possibility to apply construction-technical solutions is limited
- the existing traffic management elements operate separately

Recommendations:

- optimising traffic management and integration of individual elements by a traffic-control station
- application of telematics and intelligent traffic management with modern technologies
- traffic light control, wider implementation of traffic lights at large intersections, their mutual interconnection, higher degree of control by a traffic control station
- operation of variable traffic signs and traffic light signals
- traffic control during emergencies (such as floods), preparation of transport scenarios, programs reflecting changes of intensities
- complex and optimised traffic management with the central traffic-control station

Individual steps required for implementation are described in the Action Plan for intelligent traffic management.

4.4.4 Road Safety

Usti nad Labem is committed to improve its living environment. Within the long-term goal, the city aims to increase the safety level on local roads, encourage walking and cycling in the city and improve the urban space. It focuses at reducing number of deaths and injuries caused by traffic and consequently decreasing the number of road accidents.

Main issues:

- growing traffic intensities present greater safety risks for city residents
- high rate of traffic accidents in the city
- insufficient quality of the transport network

Recommendations:

- wide application of calming elements
- continuous elimination of safety deficits, based on safety inspections and audits
- application of tools for safety improvements
- specific solutions for critical sections of the infrastructure
- ensuring prevention and promotion of road safety

Individual steps required for implementation are described in the Action Plan for road safety improvements.

4.4.5 System Reliability

The chapter deals with problems of the critical infrastructure in the city, which defects can seriously influence transport conditions in the city. It describes the need of its reliable operation in order to ensure functions of the city. The critical infrastructure includes bridges, tunnels and other transport structures.

Problems of the critical infrastructure are divided according to:

- malfunctioning caused by intrusion, which elimination demands time and resources
- malfunctioning caused by traffic overload or incident, which is of short-term duration and does not present significant demands on removal

The critical infrastructure in the city is identified and further divided according to causes and consequences of its malfunctioning and requirements for recovery. Possible risks of the critical infrastructure are described and suitable protective measures are proposed.

Main issues:

- overloaded traffic on main routes in the city
- frequent occurrence of congestions
- impact of natural conditions on city transport (such as floods)
- high accident rates

Recommendations:

- ensure operation ability of main transport hubs

- improvements of monitoring, control , protection and prevention

Individual steps required for implementation are described in the Action Plan for intelligent traffic management.

4.4.6 Environment

The chapter describes impact of traffic on inhabitants and city life. It is focused on negative effects, such as noise, pollution, vibration, smell, contamination, landscape fragmentation, etc. It describes measures suitable for prevention and reduction of environmental burden of transport.

Main issues:

- high intensity of motor transport in the city
- accumulation of negative impacts of transport on the city environment, such as noise, emissions, vibrations, contamination of soils, fragmentation of land
- impact of health of inhabitants

Recommendations:

- reduction of environmental impacts of transport on the city, mainly:
    - measures to reduce emissions: shift to electric traction, use of alternative fuels, modernization and renewal of vehicles fleet and transport facilities, integration of transport systems, optimization of traffic management, restrictions for motor transport, introduction of low-emission zones, reduction of freight transport, charges for entering the city centre
    - measures to reduce traffic noise: at noise source (quiet tires, road surface, etc.), noise protection (noise barriers, insulation, etc.), traffic organization (telematics, traffic restrictions, etc.)

Individual steps required for implementation are described in the Action Plan for environmental protection.

4.5 Action Plans

4.5.1 Action Plan for Mobility Improvements

4.5.1.1 Priorities

The following priorities are identified for the action plan:

- Improve mobility and accessibility
- Improve conditions for barrier-free transportation
- Improve conditions for walking and cycling
- Increase safety of vulnerable road users
- Increase awareness about mobility options

4.5.1.2 Main Objectives

For fulfilment of the priorities, the following main objectives were identified:

- Increase city attractiveness for pedestrians and cyclists
- Remove barriers of city mobility
- Increase mobility options and safety of vulnerable and handicapped transport users
- Ensure accessibility of major points of interest in the city
- Develop walking and cycling modes of transport
- Support public transport
- Improve awareness about possibilities of urban mobility

Note: Development of cycle transport and support of public transport are the subject of separate action plans.

Improve city attractiveness for pedestrians and cyclists

1) **Action - Mapping barriers and deficits of access routes to major destinations in the city**

2) **Action – Identifying major barriers on pedestrian routes and set priorities for their removal**

3) **Action – Provision of information about barrier-free access routes on the city web portal**

4) **Action – Inspection of pedestrian zones and main pedestrian routes, identification of deficits**

5) **Action – Establishing a plan for improvement of public spaces and pedestrian routes**

6) **Action – Improving conditions for using alternative transport vehicles, e.g. electric bicycles or Segways (charging, locking, storing, renting)**

7) **Action – Increasing capacity and attractiveness of leisure and resting areas and facilities (benches, gazebos, shelters, greenery, adequate maintenance, etc.)**

Removing barriers and supporting mobility

8) **Action - Gradual removal of barriers in accessibility of public buildings, services and public transport**

9) **Action - Setting up ramps, platforms and lifts accessing public buildings and facilities**

10) **Action - Modifying all crossing points as barrier-free with the standard tactile elements**

11) **Action - Modifying all PT stations as barrier-free with the standard tactile elements**

12) **Action - Introduction and development of an electronic blind communication system between blind equipment (a stick) and a vehicle, station or crossing**

Developing pedestrian mobility

13) **Action - Improving quality of pedestrian routes and conditions for development of non-motorised city transport, in connection to public transport**

14) **Action - Ensuring barrier-free access to major destinations for pedestrians in the city**

15) **Action - Restricting motor transport in the city centre in favour of pedestrians, cyclists and public transport**

16) **Action - Improving public spaces by implementation of calming elements, especially in the city centre and residential areas**

17) **Action - Providing awareness about possibilities and benefits of pedestrian transport and about barrier-free access routes**

Increasing safety of vulnerable road users

18) **Action – Expanding the system of city cameras**

19) **Action - Establishing safe zones for movement of pedestrians in evening hours**

20) **Action - Providing surveillance in public transportation, ensuring safe access to PT stations and other important destinations in the city**

21) **Action – Ensuring safe trips of children to/from schools, providing safe pedestrian crossings in the vicinity of schools and crossings from PT stations**

22) **Action – Utilising school buses and minibuses to transport children to/from schools and to after-school activities**

23) **Action – Organising "walking buses", accompanying smaller children to schools**

24) **Action – Creating conditions to enable using bicycles (and scooters) for commuting to/from schools**

25) **Action - Providing short-term parking "kiss and ride" premises with a time limit of 20 minutes for parents transporting children by cars**

26) **Action – Ensuring safe passability of pedestrian routes in winter and removing safety shortcomings from these routes**

27) **Action – Increasing maintenance on roads in the vicinity of retirement homes, schools and health facilities**

28) **Action - Regular monitoring of safety conditions of the existing infrastructure for pedestrians and cyclists**

29) **Action - Preventive identification of potential risks already at the project phase**

30) **Action - Ensuring effective recovery of identified safety deficits**

31) **Action - Strengthening police control supervising pedestrian flow, primarily at pedestrian crossings on busy roads, at schools and other busy areas**

Accessibility of main points of interest for pedestrians

32) **Action - Ensuring barrier-free access to public buildings and suitable access from PT station and providing short-term parking for visitors**

33) **Action - Ensuring barrier-free accessibility of medical facilities and suitable access from PT stations and providing short-term parking for visitors**

34) **Action - Ensuring barrier-free accessibility of cultural and educational facilities and suitable access from PT stations and providing short-term parking for visitors**

4.5.1.3 Promotion and Education

35) **Action - Providing information about barrier-free access routes and points of interest through the interactive website application available at official city website**

36) **Action - Providing tourist information, including maps, directions for pedestrians and cyclists, information about parking possibilities, etc.**

37) **Action - Providing information and promotion materials about pedestrian and cycling routes and relevant facilities**

38) **Action - Providing information about public transport services, taxi services and alternative options, including charging stations, filling stations, repair shops and rental shops, etc.)**

39) **Action – Encouraging safe and considerate behaviour of road users, e.g. wearing protective and reflective elements (lights, helmets, belts, jackets and other safety gear)**

40) **Action – Organizing and participating at education campaigns supporting safe and sustainable mobility, minimizing the negative impacts of transport on the city environment**

41) **Action – Organizing campaigns to increase awareness about urban mobility options and accessibility of important destinations in the city in various forms (promotion materials, media, advertisements, websites, workshops, etc.)**

4.5.1.4 Cooperation

42) **Action - Developing close cooperation with regional authorities, the PT Company of Ústí nad Labem, civil associations, public service companies, consultation and engineering organisations and professional public**

43) **Action - Developing cooperation among public transport operators towards integration of urban public transport, railway transport, water transport and a cableway)**

44) **Action – Developing cooperation with cities in the Czech Republic and abroad and gather best practise in the field of mobility**

45) **Action - Actively search and participate into other projects for mobility development**

4.5.1.5 Financing and Personal Cover

46) **Action – Ensuring personal and financial resources in order to systematically fulfil the long-term objectives**

47) **Action – Utilising European funds and other grants, ensuring their transparent and efficient usage and fulfilment of goals**

4.5.1.6 Time Schedule

48) Action – Creating a long-term schedule of anticipated actions to fulfil short and long term objectives, monitoring compliance with the deadlines and achieving of results

4.5.1.7 SWOT Analysis

49) Action – Developing the SWOT analysis of the city potential for mobility development accessible for everyone

Action from the Action Plan for MOBILITY IMPROVEMENTS	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.2 Action Plan for City Logistics

4.5.2.1 Priorities

For the freight transport policy development, the following priorities were defined:

- To achieve reduction of burden caused by freight transport, primarily in the city centre
- To streamline logistics of freight transport, supplies and services
- To reduce negative impacts associated with freight transport on infrastructure, road safety, traffic fluency, noise and dust levels

4.5.2.2 Main Objectives

The main objectives of the efforts described above are the following:

- To exclude unnecessary freight transport from the city territory
- To improve organisation of freight transport in the city

- To encourage modal change by means of restrictions
- To optimise logistics by means of spatial development and achieving more suitable location and interconnection of transport sources and destinations

4.5.2.3 Required Actions

The basic document used for formulation of specific actions required for freight traffic improvements was the Strategy for Development of the City of Ústí nad Labem for the Year 2015, approved by city authorities, which is defining visions and goals of the city, with the following specific objectives:

- To improve conditions for sustainable development of transport in the territory of Ústí nad Labem
- To streamline serviceability of the city and its catchment area by public transport, increase attractiveness of public transport and its link to the other transport modes
- To improve and develop the transport infrastructure of the city

The main issue is to achieve sustainable freight logistics by means of regional and municipal policy as the current freight transport activity is one of the major sources of harmful emissions in the city environment.

Excluding transiting freight transport from the city territory

1) **Action - Detailed evaluation of regular surveys and traffic censuses carried out at the national, regional or local level and detecting of freight transport flows**

2) **Action - Collection and assessment of data on movement of goods and services in the city**

3) **Action - Establishing detailed matrices of journeys and volumes of transported goods and services in the city**

4) **Action - Constructing a detailed model of transit, source and destination transport in the city**

5) **Action - Analysing detected volumes and routes of transit traffic**

6) **Action - Identifying suitable routes for transferring freight transport outside the sensitive parts of the city (the city centre and residential areas)**

7) **Action - Verification of suitability of freight transport routes from various aspects, involving safety issues**

8) **Action - Implementation of alternative suitable routes avoiding the sensitive city parts**

Efficient organisation of necessary freight transport

9) **Action - Analysing inefficient and inadequate management of urban transport, which affects delivery of goods, and proposing the more convenient one, based on the findings of the study of Noise Reduction and Efficient Goods Distribution realised within CIVITAS**

10) **Action - Introducing city-logistics solutions into the transport policy of the city**

11) **Action - Ensuring data collection relevant to movement of goods in the city, gathered from business owners and other subjects distributing goods and services in the city**

12) **Action - Creating a model of movement of goods and services in the city, which will become part of the traffic model of the city**

13) **Action - Implementing efficient distribution of goods and services, based on the results of the CIVITAS Archimedes study T67.1**

14) **Action - Improving communication and cooperation among local businesses in matters of transportation to establish freight quality partnership enabling implementation of optimal goods distribution scheme**

15) **Action - Integrating urban freight transport into a transportation chain thanks to optimised cooperation of local transporters**

16) **Action - Assessment of real effectiveness of proposed measures to ensure actual optimization of traffic flows and rationalisation of freight transport**

Regulations for freight vehicles and changes of the transport mode

17) **Action - Realizing pilot measures of parking for supply vehicles and restrictions for freight transport, monitoring their efficiency and exploiting the results in the larger scale**

18) **Action - Developing and implementing ecological zones in the city**

19) **Action - Realizing sensible charges for entering the city centre for large vehicles**

20) **Action - Implementing incentive aid for ecological vehicles, such as omitting fees, providing subsidies, benefits, free parking, etc.**

21) **Action - Designing zones with restrictions for large freight vehicles**

22) **Action - Implementing regulations for parking of freight vehicles**

23) **Action - Developing appropriate parking supply in the industrial area of the city**

24) **Action - Assessing introduction of a toll system**

25) Action - Assessing possibilities of utilising logistics parks

26) Action - Make efforts towards combining and integrating road, rail and river transport

27) Action - Supporting competitiveness of waterway transport of goods, development of ports and carriage terminals

28) Action - Exploitation of trains for supply and dispatch from production plants in the city

Regulation of territorial development, optimal arrangement of sources and destinations of freight transport

29) Action – Avoid establishing large sources and destinations of freight transport in the city centre, allocate large facilities away from sensitive city parts;

30) Action – Concentrate freight transport centres in industrial areas

31) Action – Provide suitable connection of logistic centres and terminals with the Highway D8 without burdening sensitive city parts;

32) Action – Locate service facilities (i.e. post, garbage, maintenance centres, etc.) and terminals conveniently based on the optimisation scheme, develop delivery plans

33) Action - Support combined deliveries, such as internet purchases of goods or phone orders;

International and national cooperation

34) Action - Exchange of experience and training of responsible personnel

Strategic goal: achieve and maintain the technology of city-logistics at the European standard

The training programme of managers should include their regular participation in international or domestic logistics and transport conferences and seminars related to organisation and regulation of freight transport, as well as utilisation of expert publications.

35) Action - Participation in European projects

Strategic goal: increase qualifications, exchange experiences, transfer know-how, upgrade skills of technical practitioners, implementation of best practices

Participation in professional projects brings extensive benefits in knowledge and practical applications in freight regulations and city-logistics. The city gathered experience by participating in CIVITAS ARCHIMEDES and SUGAR projects. The findings will be utilised in future freight transport organisation.

Financing and personnel resources

36) Action - Planning of financial resources for development of city-logistics

Strategic goal: To ensure stability and sustainability of supply and services without burdening sensitive parts of the city by excessive freight transport

The long-term stabilisation of financial resources, using subsidy programs and European projects, is necessary for effective implementation of efficient goods distribution and freight transport restrictions, while preserving economic activities in the city.

37) Action - Providing skilled personnel

Strategic goal: To ensure highly qualified personnel for planning and management of goods distribution and freight vehicles moving in the city

Introducing principles for city-logistics and functional regulation of freight transport to minimise negative effects on the city life requires a team of experts specialised in individual transport subsystems, involving organization of logistics chains, choice of adequate regulation tools, identification of sources and destinations, optimisation of logistics without limiting economic life in the city.

Time schedule

38) Action - Processing the time schedule for gradual implementation of efficient logistics systems

Strategic goal: The reduce negative impacts of transport and goods distribution on the city environment

39) Action - Processing the time schedule for the detailed survey of sources and destinations of different types of transportations in the city

Strategic goal: Increased effectiveness of city-logistics

40) Action - Processing the time schedule for gradual introduction of regulation for freight vehicles traffic in the city

Strategic goal: Lower negative impacts of freight transport on the city environment

41) Action - Processing the time schedule for implementation of suitable routes for transit traffic and freight transport outside the sensitive parts of the city

Strategic goal: Lower the burden of freight transport for city inhabitants

42) Action - Processing the time schedule for developing and improving usage of water and rail freight transport

Strategic goal: Increase efficiency of city-logistics and reduce the burden of transport on the city life

Action from the Action Plan for CITY LOGISTICS	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.3 Action Plan for Cycle Transport Improvements

Based on the established methodology of BYPAD, the audit resulted in the Action Plan containing 48 measures divided into 9 modules. It contains a design to create conditions for systematic improvements of cycling in the city. The action plan stresses the need to determine the responsible person coordinating cycling activities and cooperating with politicians, active cyclists and the public.

4.5.3.1 Module 1 - Needs of Users

1) Determination of user needs

Regularly perform counting and research of cyclists at major cycling routes on the cycling network in the city, regularly map development of cycling usage and respond to the needs and proposals of cyclists, cooperate directly with interested groups of cyclists

2) Provision of informing and response

Use websites, information leaflets, advertising in local media about cycling options and events, provide a possibility to express own opinions and feedback, establish a contact person, organise workshops (twice a year) support the cycle transport and addressing the users

3) Cyclists platform

Ensure permanent users participation through the establishment or maintenance of cyclists platform which supports the cycling concept

4) Working group

Establish an expert team to discuss cycling issues event after the BYPAD closure

5) Active promotion

Ensure suitable promotion of cycle transport, e.g. provide tips about cycling destinations, offer cycling tours for families or experienced cyclists, provide information about commuting options, cycling events in the area, relevant services and facilities, etc.

4.5.3.2 Module 2 – Leadership & Coordination

6) Cycling coordinator

Provide a competent cycling coordinator responsible for cycle transport improvements, who will cooperate with interested parties. A cycling coordinator should be provided with all relevant information, including development projects, cycling events, suggestions from citizens, strategic development documents, reconstruction projects, etc. to ensure compliance with the cycling policy and development of the cycle transport

7) Cooperation with external organizations

Ensure close cooperation with regional authorities, the Public Transport Company, cycling associations, professional community, BYPAD working team, politicians, stakeholders, etc.

8) Active support of cycling policy by the City Council

Cycling policy as an important part of the city transport system should be part of planned events and documents for strategic development of the city

9) Collecting information

Ensure education of responsible persons and awareness of current trends and solutions for cycle transport issues in other cities, participate at conferences and seminars, gather information from open sources (internet, publications, equipment for bicycles, best practice, etc.)

10) Development of a common database

Collect data about all development projects, reconstruction projects and new buildings into a common database to provide an overview of upcoming events and compliance with the city cycling policy

4.5.3.3 Module 3 – Policy on Paper

11) Changing transport policy

Cycling must be a part of the integrated urban transport, supporting local cycling projects

12) Approval by the City Council

The Action Plan for Cycle Transport Improvements, as the other action plans, requires approval by the City Council and allocation of personal and financial resources for the implementation and further planning

13) Cooperating with other communities

It is essentially to connect the cycling infrastructure with the surrounding territories to facilitate a connected cycling network; possibly to allow developers to participate in construction of the cycling infrastructure

14) Control

Reaching objectives should be annual monitored in the form of a progress report, plan and follow the time schedule, periodically update the plans in the strategic documents

15) Sustainable transport

Develop efforts towards traffic calming, especially in the city centre; create pedestrian zones and TEMPO 30 zones, implement dedicated lanes for public transport and cyclists, reduce the number of parking spaces in the centre, allow cyclists to enter the city at routes prohibited for motor transport, provide preference for cyclists etc.

4.5.3.4 Module 4 – Tools and Personnel

16) Financing

Cycling coordinator is responsible for allocation of financial resources for cycle transport development (part of the financial resources is directly intended for promotion), planning large projects, construction of cycling facilities, setting priorities, applying for grants, etc.

4.5.3.5 Module 5 – Infrastructure and Safety

17) Traffic signs

Mark cycle routes in the city by traffic signs, mark the connection between the Polabská and Krušnohorská cycle routes

18) Improving safety

Promote and support measures increasing safety of vulnerable road users, including:

- TEMPO 30 zones
- education of drivers
- simplification of traffic signs
- public transport services for cyclists
- storage spaces for bicycles
- implementation of barrier-free modifications and removal of barriers on access routes
- provide services for cyclists, such inflating at gas stations, repair and rent services, etc.

19) Territorial planning supporting cyclists

Include cycle transport as a full part of urban planning and implement the plans

20) Construction and completion of the cycle network

Support construction and development of projects for cycling infrastructure, primarily routes enabling safe transport to work, schools, shopping areas, offices, main points of interest, connections to the Elbe cycle route and other existing routes in the territory

New development projects should be commented by local cyclists

Implement priority for cyclists at local roads, allow passage in both directions at one-way streets, improve passage at intersections

21) Management and maintenance

Clearly determine management and maintains of individual parts of the infrastructure; establish financial resources for regular maintenance; establish requirements of infrastructure and its equipment; provide a monitoring system of infrastructure conditions, reporting of defects and their removal; ensure prevention against street crime and safety of cyclists

22) Cycling equipment

Increase amount of cycling equipment, such as bicycle racks and storage spaces, primarily at public transport stations, municipal institution buildings, shopping centres, sport and cultural premises, etc. in order to improve city accessibility for cyclists

23) Parking infrastructure

Support development of public transport modes combined with cycling; prepare suitable conditions for operation of the bike and ride system and implement cycling equipment; establish sufficient parking premises at PT stations, especially in peripheral city parts; ensure security of the parking premises (surveillance cameras, locks for bicycles, etc.)

24) Public transport services for cyclists

Enable transport of bicycles (along with baby strollers and wheelchairs) in PT vehicles, especially at PT lines transporting passengers in high elevations, (however, baby strollers and wheelchairs have higher priority)

25) Services for cyclists

Support development of cycle transport by providing additional services, such as rental and repair shops, and other facilities for cyclists; support business favouring cyclists (by for example cheaper rent, parking benefits and other advantages);

26) Safety of cyclists

Cooperate with the police on programs to increase safety of cyclists; supervise traffic at locations with frequent movement of cyclists; implement traffic calming; establish safe crossing points for cyclists; rise awareness about safety issues of cyclists through promotion and education activities; encourage using proper safety gear and visibility of cyclists on roads; continue operation of the traffic court for children for training of traffic rules and safe behaviour of road users

27) Reducing the number of bicycle thefts

Provide monitoring of bicycle areas by police officers and surveillance systems; possibility of bicycle registration

4.5.3.6 Module 6 – Information and Education

28) Actions

Ensure direct contact with cyclists; utilise the European mobility week and other occasions for cycling events; organize cycling competitions and promotion happenings, such as organised cycle tours with local experts to get acquainted about local cycling opportunities (cycle routes and services)

29) Traffic education

Continue the traffic education managed by the Municipal Police, establish traffic education at schools, supplemented with the practical part for cyclists, pedestrians and PT users; continue organizing practise events; implementing additional traffic training premises; educate drivers in considerate behaviour towards cyclists

30) Website

Operate the newly established website for cyclists with an interactive map of local cycle routes; update relevant information, including pictures and videos; provide recommendations about points of interest, tips for trips, information for tourists (historical monuments, natural or technical sights, hotels, restaurants, bike rentals, repair shops, facilities favouring cyclists, sport premises, etc.); upload timetables for cycle-buses and trains, update safety warnings relevant to up-to-date situation; provide information about upcoming cycling events; establish a discussion forum and a contact person

31) Campaigns

Organise information and education campaigns and programmes, promotion cycling events with the cycling coordinator in charge; ensure participation and support of political representatives; establish a uniform design, logo and slogan for cycle transport promotion; involve media in development and news of the cycle transport policy; utilise information leaflets, posters, brochures; advertisements, website, press release, bulletins, promotion gifts etc.; address specific target groups, e.g. children, youth, seniors, visitors

Cycling coordinator reports about organised events in a concise annual report with illustrations

32) Cycle maps

Provide complex information about cycling opportunities and cycling destinations in the graphical form of a cycle map and update the maps periodically

33) Safety training

Organise safety training for cyclists, specifically at the beginning of the cycling season

34) Customer care

Identify specific needs of cyclists and organise targeted events, such as programmes for beginners, programmes for schools and pre-schools, programmes for visitors, involve bicycle rentals or sellers, PT operators, etc.

4.5.3.7 Module 7 – Promotion and Partnership

35) Bicycles in service

Increase use of company and public bicycles and increase their visibility (uniform design and promotion in media) – currently to some extent used by the Municipal Police

36) Commuting to work/school

Increase usage of bicycle for everyday transport (to work and school); define commuter plans for companies; establish park and bike premises; support development of cycling facilities, such as safe storage, changing rooms and showers at large working places (including the Municipality building); expand cycling projects in favour of safe and regular cycling

37) Promotion

Organise family events, education of children, tours with experts and other promotion activities in the region

38) Roundtable sessions

Organise roundtable session with representatives of the city and city districts, local schools, and the public, with cyclists and transport experts, media, etc. about topics related to cycle transport issues, such as barriers for daily usage, visions and trends in development, best practise experience, etc.

39) School cycle routes

Provide map guides for schools about safe access routes for cyclists and relevant information

4.5.3.8 Module 8 – Additional Events

40) Restrictions for individual motor transport

Implement restrictions for individual motor transport in the city, primarily calm the city centre; establish pedestrian and Tempo 30 zones; establish dedicated lanes for cyclists; reduce parking options in the city centre; establish zones with prohibited motor transport with access for cyclists

41) Health

Present cycle transport benefits for a physical health, reduced risk of cardiovascular diseases, obesity, osteoporosis, etc.; provide information about impact of modal shift change on environmental improvements; recreation benefits of cycling trips; healthy life style

4.5.3.9 Module 9 – Evaluation and Effects

42) Cooperation with the city and police of The Czech republic

Assess traffic accidents involving cyclists based on police records; discuss causes and consequences of traffic accidents; analyse existing deficits of the cycling infrastructure and improve its safety; monitor effectiveness of realised activities for cycle transport improvements

4.5.3.10 Conclusion and Recommendations

Progress of realised actions for cycle transport development should be periodically assessed and review by the BYPAD methodology.

Action from the Action Plan for CYCLE TRANSPORT IMPROVEMENTS	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.4 Action Plan for Public Transport Improvements

The action plan is aimed at maintaining the high share of passengers and improving its services. The Action Plan is based on the Strategy for Development of the City of Ústí nad Labem for the Years 2007 and 2015.

4.5.4.1 Main Objectives

Basic objective of the Action Plan are the following:

- Providing attractive integrated public transport services
- Improving transport serviceability

- Providing sufficient technical infrastructure
- Providing suitable vehicle fleet and its gradual renewal
- Ensuring safety of provided services
- Optimizing the management system
- Ensuring priority in the city traffic
- Providing relevant convenient information
- Providing suitable dispatching systems
- Ensuring sufficient promotion of PT services
- Ensuring financial and personnel resources
- Ensuring political support
- Ensuring international cooperation and transfer of know-how

Providing attractive integrated public transport services

1) **Action - Create a functional and attractive integrated public transport system, covering the territory of Ústí nad Labem and surrounding areas; integrate urban buses and trolleybuses, coaches, trains regardless a transport operator**

2) **Action – Integrate long-term parking services at PT**

3) **Action – Establish a complete tariff integration with a single travel ticket**

4) **Action – Establish a uniform system of information provision supporting transfer relations**

5) **Action – Establish a united fully integrated dispatching system, evidence and mutual clearing of sales and performances**

6) **Action – Establish a politically responsible entity and managing entity (authorized coordinator) for the integrated system**

7) **Action – Optimise mutual cooperation of transport carriers in order to offer attractive and effective transport**

Improving transport serviceability

8) **Action – Introduce a service standard in area coverage, time coverage, capacity coverage and quality coverage (involving accessibility, provision of information, etc.)**

9) **Action – Optimise operation times within the integrated system**

10) **Action – Ensure quality of operated vehicles – clean, safe, guaranteed low floor connections, suitable for people with mobility difficulties and mothers with strollers and small children, etc.**

11) **Action – Monitor services by surveys of occupancy, number of passengers during different time periods, number of wheelchairs, bicycles, luggage transport, etc.**

12) **Action - Regularly optimise routes of PT lines based on surveys and the city traffic model; verify accessibility of stations, optimise time tables and transfer links**

13) **Action - Verify optimal time accessibility of major destinations in the area and time delays during transfers thought the traffic model of the city**

Providing sufficient technical infrastructure

14) **Action - Achieve modernization and further development of trolleybus lines**

15) **Action - Ensure high reliability of power source, including the ability to back-up the source**

16) **Action - Ensure quality of roads and removal of distortions at PT routes**

17) **Action - Modernize stops and stations; ensure barrier-free accessibility, large boarding areas, secure equipment at shelters, proper markings, lightning, timetables, trash cans, information displays, benches; provide option to purchase a ticket**

18) **Action - Optimize location and equipment of PT depots in the integrated public transport system**

19) **Action - Ensure effective operation of PT vehicles of the integrated system, provide high-quality repairs and maintenance; convenient placement of fuelling stations;**

20) **Action - Ensure modern premises for personnel and drivers of the integrated transport system, including suitable facilities on turning and waiting points**

21) **Action - Ensure efficiency of public transport management system, including adequate administrative facilities**

22) **Action - Ensure modern control stations and management services, including location tracking, occupancy monitoring, driver´s records, allowing to use traffic data for optimal planning of services, full utilisation of available capacity or preference of public transport vehicles in the city transport system**

Providing suitable vehicle fleet and its gradual renewal

23) **Action – Gradually achieve reduction in the average age of vehicles of the integrated system in order to fulfil conditions for operational reliability, safety and traffic economy**

24) **Action – gradually shift to more ecologic types of power in the interest of energy savings and sustainability of transport; use natural gas, hybrid and electric traction; put vehicles with high fuel consumption and considerable maintenance and repair demands out of operation**

25) **Action – Implement more low-floor vehicles and operate regular lines with guaranteed low-floor services**

26) **Action – For vehicle fleet renewal, take into account noise pollution, especially on routes with significant height differences**

27) **Action - When restoring the vehicle fleet, ensure easy maintenance and cleaning of vehicles and comfort of their interior, especially seats and handrails**

28) **Action - When restoring the vehicle fleet, consider vehicles size and number of seats with regard to accessibility of certain areas and expected occupancy**

29) **Action - When restoring the vehicle fleet, ensure a balanced modernization of all types of vehicles, including buses, trolleybuses, the cableway, service vehicles, tow-away vehicles, dispatching vehicles and trains**

30) **Action – Ensure good-quality repair, maintenance and cleaning services**

31) **Action - When restoring the vehicle fleet, ensure sufficient space dedicated to wheelchairs, strollers and luggage**

Ensuring safety of provided services

32) **Action - Achieve systematic care for traffic safety by thorough vehicles inspections, regular training of drivers and their examinations in terms of health control, relaxation, alcohol, drugs, etc.**

33) **Action – Monitor and analyse traffic accidents according to their causes and introduce appropriate recovery and prevention measures**

34) **Action – Provide camera surveillance in vehicles for increased passenger safety, (also monitoring entrance and exit areas), enabling automatic saving of images for possible investigation**

35) **Action – Provide surveillance cameras, police control and sufficient lightning at PT stations and access routes, especially in underpasses**

Optimizing the management system

36) **Action - Achieve optimal performance and attractiveness of public transport services by introducing intelligent management system and tracking of vehicles, monitoring location, occupancy, compliance with timetables and deviations**

37) **Action - Create an integrated control centre for both individual and public transport, based on traffic data collection, on-line traffic models and short-term prognosis**

38) **Action - Maximally automate dispatching traffic control and interfere only in emergency situations; integrate the control station will all current information systems**

39) **Action – Provide short-term and long-term prognosis of the transport network and transport demand, based on historical development and data about repeated and specific traffic conditions and special events**

40) **Action - Ensure communication with vehicles and stations, collective parking premises, police, technical services, health services, repair services, etc.**

41) **Action – Optimise organization of closures and changes in timetables to minimize impact on passengers; keep sufficient adequate vehicle backups to cover emergency situations**

Ensuring preference in the city traffic

42) **Action - Ensure optimal performances of public transport through dedicated lanes, controlled driving out of stations and intelligent preference at traffic light controlled intersections**

43) **Action – Ensure control of vehicles operation and deviations from timetables**

44) **Action - Use the traffic-control station gathering information about current traffic to predict delays, provide information about arrival times to stations and create optimal strategy to minimise deviations from timetables, maximize system reliability and increase speed of public transport vehicles**

Providing relevant convenient information

45) **Action - Ensure awareness about public transport services, timetables, tariff systems, tickets purchases, transport control, changes and closures, etc.**

46) **Action - Gradually introduce modern information systems at stations, informing about actual (not scheduled) arrivals of individual lines**

47) **Action - Significantly improve information systems at railway stations and transfer points, including information about arrival times of urban buses and trolleybuses, Park and Ride premises, etc.**

48) **Action - Provide information about public transport services, including current arrivals, via internet and mobile phones**

Providing suitable dispatching systems

49) Action - Provide gradual modernization of check-in systems

50) Action – For new dispatching systems, take into consideration the need of baggage manipulation, possibility of control, saving data about transported persons, entry and exit, accessibility, etc.

51) Action – Offer universal tickets, possibility of charging cards, disable abusing of tickets, ensure low costs, reliability of functions, easy manipulation (preferably contact-less), etc.

Ensuring sufficient promotion of PT services

52) Action – Promote public transport services, benefits and all available forms by various media

53) Action – Realise promotion on the internet, Facebook, magazines, radio, television, emphasize newly purchased vehicles, newly opened lines or newly established connections and services

54) Action - Continue in publishing periodical books about PT in Ústí nad Labem and its history in the region

Ensuring financial resources

55) Action – Establish a long-term stability of financial resources for the system

56) Action - Negotiate the tariff policy, rates favouring some user groups, subsidies and compensation for demonstrable loss with city representatives

57) Action - Ensure efficient control eliminating illegal passengers

58) Action - Establish optimal tariff system in order to achieve maximum attractiveness and profitability of the system, in addition to the necessary funding

59) Action - Optimize operating costs and modernize the vehicle fleet

60) Action - Optimize purchases of fuel and energy based on anticipated market development

61) Action – Perform activities to improve economic results (sale of fuels, rental of vehicles, etc.)

62) Action - Optimize investments in buildings and operating devices, vehicles information and dispatching systems and wages

Ensuring political support

63) **Action - Ensure political support for maintaining and increasing the share of public transport in the modal split**

64) **Action - Ensure political support for modernization of the vehicle fleet and infrastructure;**

65) **Action - Ensure political support for subsidizing public transport operation**

66) **Action - Ensure political support for preference of public transport and regulation of parking in the city centre**

Ensuring international cooperation and transfer of know-how

67) **Action - Ensure continuation and further expansion of membership in transport projects and associations**

68) **Action - Ensure transfer of latest knowledge in the field of traffic and transport management, restoration and maintenance of vehicles, use of ITS technologies, participate in international and domestic exchange of information**

69) **Action – Ensure gradual education of technical management of transport carriers**

70) **Action - Allow participation at international and domestic seminars and conferences related to modern PT services**

Personnel resources

71) **Action - Ensure high-quality management of PT services via tenders**

72) **Action – Focus on proper qualification and further training of drivers, dispatchers, employees of information centres, maintenance personnel, etc. in order to ensure reliable and safe operation of the public transport system**

73) **Action – Provide psychological tests for drivers and personnel in contact with passengers**

Time schedule

74) **Action - Ensure implementation of individual steps of the action plan according to an approved schedule**

75) **Action - Regularly update progress of the steps and compliance with the schedule**

76) **Action – Monitor and regularly report about the progress, delays and changes in the plan to political authorities and to the public**

Action from the Action Plan for PUBLIC TRANSPORT IMPROVEMENTS	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.5 Action Plan for Improvements of Traffic Flow

The Action Plan is based on the Strategy for Development of the City of Ústí nad Labem for the Years 2007 and 2015.

4.5.5.1 Main Objectives

In order to improve traffic flow in the city, the following main objectives were defined:

- Consistently remove obstacles restricting fluency of traffic flow
- Remove conflicts between individual transport modes
- Increase reliability of traffic operations and eliminate failures of management systems
- Increase traffic safety and minimise occurrence of traffic accidents restricting traffic fluency
- Improve maintenance of the road infrastructure
- Ensure good state of utility lines located in the city infrastructure
- Regulate construction and other activities along the roads
- Optimize the traffic management system

Consistently remove obstacles restricting fluency of traffic flow

1) **Action – Map problematic locations and causes of conflicts, delays and congestions by measurements of traffic flow and inspections with digital recording**

2) **Action - Provide short, medium and long-term transport prognosis and modelling of traffic flow fluency**

3) **Action - Create a map of periodic transport congestions and time losses**

4) **Action - Create an overview of localities with frequent congestions and identify deficits in traffic fluency**

5) **Action - On the basis of previous findings, propose measures and time schedule for gradual elimination of detected defects in traffic fluency**

6) **Action – Identify possibility of implementing transport infrastructure system**

7) **Action – Realise possible improvements of through-roads in the city**

8) **Action - Analysis possibility of diverting the major traffic burden from the city centre**

9) **Action - Increase efficiency and safety of intersections (by means of reconstruction, enlarging capacity and improving management)**

Specific solutions proposed for inconvenient intersections are described in the plan.

International and national cooperation

10) Action - Exchange experiences and provide training of management personnel

Strategic goal: Reach technological, qualitative and safety level of traffic management at European standard

Training programme of management personnel should include their regular participation at international or domestic conferences and seminars relating to traffic fluency and evaluation of effectiveness of measures. It is also appropriate to utilise available expert literature.

11) Action - Participate in projects and programmes for traffic management and improvements of traffic flow

Strategic goal: Increase qualification, exchange experiences, facilitate transfer of know-how, implement best practices

Participation in projects brings opportunities in knowledge exchange and practical application of traffic management.

Financing and personnel resources

12) Action - Planning of financial resources for development of transport systems for individual transport

Strategic goal: Ensure stability and sustainability of development of the transport infrastructure with social benefits

Provide long-term financial resources and subsidies, participate in relevant development programmes and European projects in order to develop and efficiently use the transport infrastructure.

13) Action - Ensuring good qualification of personnel

Strategic goal: Ensuring highly qualified personnel for planning and management of optimal traffic operation and effective development of the transport infrastructure

Specialised experts for each transport subsystems are required to enable operation of on-line traffic models, strategy planning, development of solutions, prioritization of measures, managing investment activities, supervising modernization of the transport infrastructure, etc.

Time schedule

14) Action - Processing the time schedule for effective transport infrastructure development

Strategic goal: Achieve sustainable transport development

15) Action - Processing the plan for progressive reconstruction and completion of the transport network for individual and collective transport

Strategic goal: Increasing efficiency and attractiveness of the transport system and serviceability of the area

16) Action - Processing the schedule for elimination of conflicts between the transport modes were possible

Strategic goal: Increasing efficiency and attractiveness of the transport system and serviceability of the area

17) Action - Processing the schedule for gradual reconstructions and removal of deficits of the transport network

Strategic goal: Increasing the efficiency of management system with communication and its accessories and restrictions of traffic closures

18) Action - Processing the time schedule for introducing logistics of optimal congestion limitations

Strategic goal: Increasing efficiency of city-logistics and reducing the traffic burden in the city

19) Action - Processing the time schedule for gradual identification of capacity deficits and their elimination

Strategic goal: Limiting periodic congestions and their causes

20) Action - Processing the time schedule for gradual implementation of missing transport links, which would allow reduction of traffic load in sensitive parts of the city

Strategic goal: Improving living environment in the city while maintaining necessary transport serviceability and increasing attractiveness of the territory

Action from the Action Plan for IMPROVEMENTS OF TRAFFIC FLOW	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.6 Action Plan for Parking Improvements

4.5.6.1 Priority

For parking improvements in the city, the following priorities were defined:

- Increase traffic fluency in the city
- Improve conditions for parking in different city parts
- Establish an effective parking system
- Encourage greater compliance with traffic rules
- Improve safety of road users

4.5.6.2 Objectives

- Short term objectives:
  - Formulate a reasonable parking policy with balanced parking supply and regulations
- Medium term objectives:
  - Provide parking possibility for residents
  - Ensure parking at health facilities
  - Ensure short-term parking at offices, services and cultural facilities
  - Clarify and mark the system of paid parking in the city centre
- Long term objectives:
  - Compensate the parking deficit
  - Establish a balanced parking system

Monitoring and traffic predicting

- Determine current parking needs
- Determine future parking needs with regard to the expected level of motorization and planned changes in the city (construction, Master Plan, etc.)

Transport organization

1) **Action - Formulate and discuss reasonable parking policy with balanced offer and regulations**

2) **Action - In the framework of the integrated transport system, engage services with long-term parking at public transport stations**

3) **Action - Based on current condition, the Master Plan of the city and trends in the world, determine future parking needs with regard to the expected level of motorization and planned changes in city**

4) **Action - Create a complete integration of information about transport services, including parking**

5) **Action - Ensure possibility to park for residents in their home area**

6) **Action – Provide short-term parking at medical, cultural and educational facilities, offices, services and cultural facilities.**

7) **Action – Establish a paid parking system according to attractiveness of a locality, duration of parking, importance of destination, parking capacity, etc.**

8) **Action – Compensate the parking deficit and establish a balanced parking system by introducing suitable economic tools (suitable charging tariffs), construction tools (new parking premises), organizational tools (optimise parking by improved organisation) and engaging private operators**

Regulation and surveillance

9) **Action - Clearly mark all parking areas and define relevant restrictions and charges**

10) **Action - Ensure a parking systems clear for visitors and foreigners, in accordance with common European standards**

11) **Action - Create conditions for convenient parking of supply and service vehicles not restricting traffic**

12) **Action - Clearly indicate operators of parking devices and areas in the city and negotiate balanced tariffs between individual devices (aboveground and underground garages, parking lots, yards, street space)**

13) **Action - Create an effective way to control compliance with parking rules, ensure penalties enforcement; establish a single area for towed vehicles with non-stop operation**

14) **Action - Ensure compliance of parked vehicles with traffic rules in order to increase traffic safety and allow passage of service vehicles**

15) **Action - Ensure periodic safety inspection of parking spaces**

Restrictions

16) **Action - Ensure sufficient control of parked vehicles, apply adequate penalties for violations**

17) **Action - Ensure coordination of national and municipal police control**

18) **Action – Apply educational punishment, focus on serious violations threatening safety of road users**

Promotion, information and awareness

19) **Action - Publish and regularly update information leaflets about parking conditions and parking rules, regulation methods, payment methods and capacity of parking premises**

20) **Action – Provide information about parking on the city website for download in various languages (Czech, German and English)**

Cooperation

21) **Action - Develop close cooperation with regional authority, the Public Transport Company, civic association, public companies, consulting and engineering organizations and public experts, etc.**

22) **Action - Develop cooperation with other cities, utilise experience with parking schemes and issues, use experience of participation in transport projects**

Financing and personnel resources

23) **Action - Ensure a permanent funds from the city budget on realization of traffic calming, identify possibilities for grants and participation in transport projects, define responsibilities for specific actions, identify a person in charge, ensure control and feedback for the actions**

Time schedule

24) **Action - Create a time schedule for fulfilling the set actions**

Action from the Action Plan for PARKING IMPROVEMENTS	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.7 Action Plan for Intelligent Traffic Management

4.5.7.1 Objectives

The focus of efforts is to utilise ITS technologies to facilitate functioning urban and suburban transport and providing necessary transport services.

The basic objectives are:

- increase traffic fluency;
- increase traffic safety
- increase comfort when using public and individual transport;
- reduce negative impacts of motor transport on population and environment;
- facilitate improved access to transport information and services.

Using technology for transport management and organisation

1) Action - Building and developing traffic light devices and the control system

Strategic goal: Increase safety and traffic fluency on the city territory

2) Action - Optimizing time settings of traffic light devices

Strategic goal: Reducing the impact on the environment

3) Action – Optimizing the signal programs

Strategic goal: Increase safety and fluency of traffic

4) Action: Introduce LED signals which have lower energy consumption and therefore lower associated emissions.

Strategic goal – Reducing the impact on the environment

5) **Action - Strategic placement of detectors on selected sections of the road network in the city**

Strategic goal: Facilitate improved access to traffic information

6) **Action - Building a network for transmission of transport data**

Strategic goal: Facilitate improved access to traffic information

7) **Action - Building the system of PT preferences on traffic light controlled intersections**

Strategic goal: Increasing traffic fluency, reducing environmental impacts

8) **Action – Establishing the traffic management centre and centre for provision of traffic information**

Strategic goal: Facilitate improved access to traffic information

9) **Action – Providing guidance for parking, with relevant information about occupancy, etc.**

Strategic goal: Reduction of environmental impacts

10) **Action – Utilising outputs of transport and surveillance cameras for more comprehensive information about traffic situation**

Strategic goal: Facilitate improved access to traffic information

11) **Action - Providing real-time traffic information**

Strategic goal: Facilitate improved access to traffic information

12) **Action – Providing maps of traffic load online**

Strategic goal: Facilitate improved access to traffic information

13) **Action - Installing equipment for traffic information**

Strategic goal: Increasing traffic fluency

14) **Action - Providing information about travel time**

Strategic goal: Facilitate improved access to traffic information

15) **Action - Improving maintenance, especially in winter and during emergencies (for example ice detection, after floods)**

Strategic goal: Increasing traffic safety

16) **Action – Establishing control systems for movement of trucks and shipments**

Strategic goal: Freight logistics

Using technology for the prevention of incidents and accidents

17) Action - Incident management – implementing measures to eliminate causes and reduce consequences of accidents

Strategic goal: Facilitate improved access to traffic information

18) Action - Linking dispatching functions of individual transport modes

Strategic goal: Speeding up an adequate reaction on extraordinary events in transport by sharing information

19) Action – Applying the control system and transport surveillance

Strategic goal: Increase reliability and security of the transport system

20) Action – Applying the surveillance system monitoring conditions of vehicles and drivers

Strategic goal: Reduce the risk of human and technical failure

21) Action - Optimising the system of administration and maintenance of the transport infrastructure technical equipment

Strategic goal: Increasing safety and reliability of the transport infrastructure

Using technology for Restrictions and enforcement

22) Action – Improving the surveillance systems monitoring safety at public spaces and in vehicles

Strategic goal: Increase safety of transport systems and users

23) Action – Expanding effective control of traffic speed

Strategic goal: Reduce the amount of traffic accidents and their consequences

24) Action – Expanding effective system of monitoring red light passage, illegal overtaking, driving in opposite direction and other violations of traffic safety

Strategic goal: Reduce the amount of traffic accidents and their consequences

25) Action – Expanding effective system of controlling driving licence, driving under the influence of alcohol, drugs and other addictive substances

Strategic goal: Reduce the amount of traffic accidents and their consequences

Using technology for payment systems in transport

26) Action – Establishing a single payment method for all transport payments based on contact-less technology

Strategic goal: Facilitate access to transport information

Promotion and raising awareness about the traffic management system in the city

27) Action – Promoting information tools for effective use of public transport services

Strategic goal: Facilitate access to transport information

28) Action - Providing on-line traffic information from the management centre for general public

Strategic goal: Facilitate access to transport information

International and national cooperation

29) Action - Exchanging experience and training of management personnel

Strategic goal: Achieve and maintain technological and qualitative levels of management of transport systems at European standards

30) Action – Participating in transport projects

Strategic goal: Increase qualification, exchange experiences and know-how, improve qualification of technical personnel, and implement best practises

Financing and personal resources

31) Action - Planning financial resources for development of intelligent the traffic management system

Strategic goal: Ensure stability and sustainability of transport management development in order to maximise social benefits

32) Action – Ensuring skilled workers

Strategic goal: Provide high quality reliable integrated transport management

Time schedule

33) Action - Processing the time schedule for gradual ITS introduction in the field of transport management and infrastructure administration

Strategic goal: Achieve sustainable transport development

34) Action - Processing the time schedule for gradual ITS introduction in the field of public transport management and its integration

Strategic goal: Increase efficiency and attractiveness of PT services

35) Action - Processing the time schedule for gradual ITS introduction in the field of sharing, processing, evaluating and providing traffic data and information

Strategic goal: Increase efficiency and attractiveness of the transport system

36) Action - Processing the time schedule for gradual ITS introduction in the field of parking systems

Strategic goal: Increase attractiveness of the city and calm the sensitive parts

37) Action - Processing the time schedule for gradual ITS introduction in the field of freight transport logistics, goods supply and services

Strategic goal: Increase efficiency of city-logistics and reduce traffic load in the city

38) Action - Processing the time schedule for gradual ITS introduction in the field of surveillance and repressive systems in transport

Strategic goal: Increase compliance with traffic rules and effectively apply regulatory measures to increase transport safety

39) Action - Processing the time schedule for gradual ITS introduction in the field of the Integrated Rescue System and all emergency systems in the city

Strategic goal: Increase efficiency of rescue operations during emergency situations

Individual actions are in the Action Plan described in detail.

Action from the Action Plan for INTELLIGENT TRAFFIC MANAGEMENT	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.8 Action Plan for Road Safety Improvements

The action plan is based primarily on safety inspections realised in the city within CIVITAS Archimedes (please see the deliverables R49.1 and T49.1) and on the National Road Safety Strategy for the years 2011 - 2020, which is the annex of the action plan (in Czech language) and which is available on the website of the Ministry of Transport of the Czech Republic, Department of Safety (www.besip.cz).

In the National Road Safety Strategy, recommended measures are divided into 3 main sections focused on the following fields of road safety:

- Safety of road infrastructure **(K)**
- Safety of transport vehicles **(V)**
- Safety of transport users **(Ú)**

Measure taken from the National Road Safety Strategy and applied on Ústí nad Labem in the action plan for road safety improvements are the following:

K1 – implementation of the European directive 2008/96/ES and its application of other roads

K2 – application of relevant legislation legal regulations for safer road infrastructure

K3 – construction of city bypasses

K4 – introduction of calming elements in inner cities

K5 – modification of intersections

K6 – improvements of traffic signs, equipment of roads and surface of roads

K7 – securing railway crossings

K8 – application of road telematics for monitoring and management of traffic

K9 – gradual reconstruction of the road network based on the principles of self-explanatory forgiving roads

K10 – modification of road space for vulnerable road users

U1 – preventively affecting all road users through education and training activities

U2 – reducing behaviour risk factors of road users by preventive information activities

U3 – emphasising influence of alcohol and addictive substances on safety of all road users

U4 – legislative support for improvements of traffic education at driving schools

U5 – ensuring support for implementation of the National Road Safety Strategy

U7 – assessment of efficiency of law enforcement of traffic rules

U8 – control of traffic rule violations

U9 – influencing vulnerable road users

U10 – introducing strict legal penalties for risky and aggressive ad behaviour and repeated violations of traffic rules

V1 – ensuring effective state expert supervision and suitable technical conditions of vehicles

V2 – increasing awareness of drivers about safety issues and prevention

Individual measures are described in detail in the document National Road Safety Strategy for the Years 2011 – 2020.

4.5.8.1 Priorities

- Improve safety of the road infrastructure in the city
- Improve awareness about road safety issues
- Improve safety of cyclists
- Improve safety of pedestrians
- Improve conditions for vulnerable road users

4.5.8.2 Target Groups

In order to efficiently implement measures for road safety improvements and reduce traffic accidents, it is necessary to approach the issue in a complex way, progress systematically and cooperate with interested parties, which are the Municipal Police, Police of the Czech Republic, and administration bodies.

The measures are divided according to their target:

- Focused on a vehicle
- Focused on a user
- Focused on an infrastructure

and according to their effect:

- Preventive
- Re-active
- Education and training
- Control and monitoring
- Repressive

The priority is given to preventive and educational measures; however, road safety has to be accompanied by efficient re-active and repressive road safety policy in order to be successful.

4.5.8.3 Main Objectives

1) **Action – Apply complex set of measures aimed at reduction of traffic accidents, severe and fatal injuries**

2) **Action – Develop a medium-term strategy of increasing traffic safety in Ústí nad Labem until 2020 with clearly defined tasks and financial support**

3) **Action - In the medium-term strategy consistently monitor fulfilment of tasks and compliance with the updated National Road Safety Strategy**

4) **Action - Regularly analyse traffic accidents in the city, identify main causes, participants, consequences, accident locations, etc. and apply adequate counter measures**

5) **Action - Perform periodic safety inspections of identified accident locations and formulate proposals for elimination of risk factors**

6) **Action - Each approved project which concerns transport solutions or severe changes in transport should undergo to the independent security audit**

7) **Action – Regularly (periodically repeated) perform safety road inspections to identify (preventively) traffic safety deficits and develop solutions (preferably low cost measures) to eliminate safety risks**

8) **Action - Install calming elements (physical and psychological) at risky locations with traffic safety deficits**

9) **Action - Support traffic education of drivers and other user groups**

10) **Action - Ensure an increase of surveillance efficiency - patrol activity, speed measurements, monitoring passage on red light, etc.**

11) **Action - Tighten and streamline restrictions - especially aggressive driver behaviour, speeding, driving under the influence of alcohol and drugs**

12) **Action - Systematically organize transport-educational campaigns**

13) **Action - Increase the number of traffic light controlled intersections, mutually coordinated**

14) **Action - Establish roundabouts where it is spatially possible and practical**

15) **Action – Eliminate rail crossings in conflict with other transport modes, improve their equipment by safety devices with gates, control lights and visible alerting traffic signs;**

16) **Action - Systematically improve conditions for mobility of pedestrian outside and across a road (sidewalks, pedestrian paths, underpasses, signalized crossings, protective islands, Z sidewalks)**

17) **Action - Systematically improve conditions for mobility of cyclists, if possible separately from motor traffic, through cycle paths and dedicated lanes**

18) **Action - Systematically create safe traffic space along roads - remove obstacles along roads or ensure adequate protection**

19) **Action – Provide traffic education of children and youth**

20) **Action – Ensure safe conditions for arrival to schools (for pedestrians, cyclists), safe access to playgrounds and youth gathering places**

21) **Action - Examine and improve clarity of intersections for drivers - even under difficult conditions (night, fog, visibility of horizontal and vertical markings, greenery, etc.)**

22) **Action - Regularly control conditions of vertical and horizontal road markings in terms of completeness, visibility, clarity etc.**

23) **Action - Use available tools of intelligent transport systems to improve safety of road users in the form of warnings, information boards, management and surveillance of traffic**

24) **Action - Improve conditions of public transport stations by ensuring their safety and accessibility**

25) **Action - Supervise technical conditions of vehicles and cargo**

26) **Action – Where possible, segregate intensive traffic flows from pedestrians and cyclists and access to public points of interest, such as educational and cultural facilities**

27) **Action - Prioritize investment into road safety measures based on evaluation of potential improvements, benefits and costs of measures**

28) **Action – Adjust permitted speed level to conditions of local roads individually, with regard to safety**

29) **Action - Maintain the road surface on high quality**

30) **Action – Provide winter maintenance of roads to ensure safe surface and avoid sudden changes in driving conditions**

31) **Action – Fulfil requirements of safe, clear and forgiving roads**

32) **Action - Monitor safety of transport passengers in the city and actively examine technical conditions of vehicles, safe driving behaviour, including health inspections and control of alcohol and other substances**

4.5.8.4 Preventive Road Safety Measures

- Prevention involves the actions 1, 2, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20 and partially also 21, 22, 23, 24, 26, 27, 28, 29, 30 and 31. Some of these actions can be also considered as re-active, if they are implemented as a solution for localities with frequently occurring traffic accidents.

Safety inspections and audits

- Actions 5, 6 and 7
- Application of measures K1 from the National Road Safety Strategy

- Regular monitoring of safety condition of the existing infrastructure
- Preventive identification of potentially dangerous locations in the project phase
- Gradual, permanent and, where possible, immediate removal of safety deficits according to priorities
- Regular and repeated monitoring of road safety conditions

Traffic regulations

- Actions 8, 26 and 28
- Application of the measures K3, K4 and K9 from the National Road Safety Strategy;
- Identification of superior roads suitable for transit traffic
- Leading transit traffic away from sensitive areas in the city
- Giving priority to public transport at the expense of individual transport, avoiding

Transport organisation

- Actions 13, 14, 15, 16, 17, 18, 19 and 21
- Application of measures K5, K7, K9 and K10 from the National Road Safety Strategy
- Modification of the road infrastructure to reflect local conditions and the actual traffic

Traffic management

- Actions 13, 14, 15, 16, 17 and 23
- Application of measures K7, K8 from the National Road Safety Strategy
- Application of control elements for more effective use of the infrastructure
- Development and modernization of traffic light devices
- Implementation of ITS elements - dynamic traffic management, immediate response to the existing situation

Removing potential accident locations

- Actions 4, 5, 6, 7 and 8
- Application of measures K1, K2, K5, K6, K10 from the National Road Safety Strategy
- Installation of calming elements (physical and psychological) at selected locations with traffic safety deficits
- Based on analysed deficits, apply adequate measures for recovery
- Monitor effectiveness of measures in long-time intervals

4.5.8.5 Law Enforcement

- Application of the actions 10, 11, 25 and measures Ú7, Ú8, Ú10 of the National Road Safety Strategy
- Penalties for violations of traffic rules
- Strict penalties for aggressive behaviour, mild penalties for less serious driving offences to achieve educational effect
- Coordination of surveillance on traffic flow done by police of The Czech republic and by Municipal Police of the city of Ústí nad Labem
- Compliance with the speed limit, especially in areas with intensive pedestrian flows, especially involving children, locations with poor visibility, long straight sections, etc.
- Ensure drivers respecting vulnerable road users, cyclists respecting pedestrians

4.5.8.6 Traffic Education

- Traffic education involves the actions 9, 12, 20 and measure U1, U2, U3, U4, U5 and U9 of the National Road Safety Strategy

Traffic education of children and youth

- Provide personal and material support for traffic education of pre-school and school children, and youth
- Equip and maintain the city traffic court for children
- Support and organise lectures, traffic competitions and other traffic training activities for children in the city, preferably in an entertaining way (e.g. cycle race for children)

Traffic education of drivers

- Impose the need to perform quality traffic training at driving schools, carry out quality control and gather feedback
- Inform the public about new trends in the field of transport and on the actual development of transport in the city
- Perform preventive safety campaigns, in both explanatory and discouraging formats (e.g. presenting consequences of traffic accidents, etc.)
- Emphasise influence of alcohol, drugs and excessive speed on occurrence and consequences of road accidents

Behaviour principles for pedestrians

- Perform an educational campaign focused on correct behaviour of pedestrians
- Explain how to prevent conflict situations
- Focus on high-risk and vulnerable road users, primarily elderly, handicapped persons, people with visual impairments, wheelchair users, etc.
- Emphasise principles of safe road crossing, visibility, eye contact with a driver, etc.

Behaviour principles for cyclists

- Perform an educational campaign on correct safe cycling
- Increase awareness on relevant valid legislation, e.g. related to obligatory equipment of a bicycle or obligations of cyclists
- Increase awareness on how to reduce risks of accidents
- Promote usage of safety helmets, reflective accessories a proper cycle gear
- Provide and promote information about cycling routes in the area and paths suitable for cycle transport

Information, education and promotion

- Organise information campaigns about road safety issues in the city in various forms (paper leaflets, posters, press, radio, local TV, websites, social networks, etc.)
- Continuously update the website dedicated to road safety in the city (www.bezpecnepousti.cz) with safety data gathered in the city, statistics, localisation of road accidents, safety warnings and advices, etc.

Supervision

- Coordinate supervision of the Police of the Czech Republic and the Municipal Police of Ústí nad Labem
- Implement measures V1 of the National Road Safety Strategy "Ensuring effective state expert supervision and suitable technical conditions of vehicles"
- Ensure coordination between individual supervising units

International and Domestic Cooperation

- Develop cooperation with cities abroad, utilise best practise and experience
- Utilise results of CIVITAS ARCHIMEDES
- Actively search and try to engage in other European projects dealing with road safety in cities
- Search for support and funding for implementation of measures increasing road safety
- Actively participate in domestic and international projects, activities, conferences, workshops and competitions aimed at road safety improvements
- Continuously keep awareness of city authorities and responsible personnel about road safety issues in the city

Financing and Resources

- Provide continuous funding from the budget of the city, region and state
- Apply for funding from the European Union and other European funds
- Define responsibilities for specific actions, identify persons in charge

Time Schedule

- Create a timetable of actions in order to meet the short-term and long-term objectives

4.5.8.7 Annexes to the Action Plan

The SUTP Action Plan for cycle transport improvements contains the following annexes attached to the original document (in the Czech language):

- Action Programme of the National Road Safety Strategy for the years 2011 to 2020 (the original document for download is available at the official website of the Ministry of Transport, department for road safety: www.besip.cz)
- Resolution of the Government of the Czech Republic No. 599 from 10th August 2011 about the approval of the National Road Safety Strategy for the years 2011 to 2020

Action from the Action Plan for ROAD SAFETY IMPROVEMENTS	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be filled in by a city authority responsible for transport for each year*

4.5.9 Action Plan for Environmental Protection

4.5.9.1 Priorities

- Improve conditions for utilisation of environmental-friendly processes
- Improve the living environment in the city
- Improve conditions for using renewable resources
- Decrease the negative impacts of transport on the environment and on city inhabitants

4.5.9.2 Main Objectives

1) Action – Optimize the transport system

Optimize the transport system is a complex way, involving improvements prioritizing public transport operation, walking and cycling, reducing the share of individual motor transport

realised for inner-city routes, improving traffic fluency and road safety and lowering traffic burden afflicting sensitive city parts

2) Action – Renew the vehicle fleet

Ensure gradual renewal of the vehicle fleet, modernizing vehicles of urban public transport, maintenance and service vehicles, including vehicles of the Municipal Police, delivery vehicles, post vehicles, cleaning vehicles, vehicles of the Integrated Rescue Service, etc. Apply noise preventing tyres on the vehicles

3) Action – Reduce traffic speed

Achieve and control reduction of speed to the permissible level in order to reduce traffic noise and improve road safety, especially at locations with intensive mobility of pedestrians and at roads with intensive traffic of heavy freight vehicles. Increase noise reduction by gradually reconstructing the road surface in the city

4) Action – Implement sound preventing equipment of railway transport

Ensure complex modernization of railway transport and eliminate the most significant sources of noise, primarily on low-quality railway tracks and sidings, at railway crossings and in directional curves

5) Action - Use roads with sound preventing surface and tyres

Ensure gradual renewal of road surface, especially at heavily loaded roads and in residential areas, by medical facilities, at schools and other sensitive areas

6) Action - Use soundproofing walls

Apply other noise reducing measures, such as sound-proofing walls and other noise barriers at locations with heaviest traffic noise pollution

7) Action – Plant greenery

Support planting of insulating greenery to protect road users against excessive dust and noise in the city

8) Action – Place residential areas high above the road level

Through regulations and incentives, support construction and development of residential areas away from the busiest roads

9) Action – Introduce tolls for motor vehicles

In the current state, tolls cannot be applied in the city centre on the main through-roads of I and II class due to lack of suitable alternative routes outside the city centre

10) Action – Apply traffic restrictions for heavy freight vehicles

Develop a scheme for traffic of heavy freight vehicles based on detailed analysis of sources and destinations of freight transport and possible alternative routes avoiding sensitive parts of the city

11) Action – Develop regulatory principles for busiest roads

Develop a regulatory plan reducing traffic on the busiest roads during excessive smog situations, examine effectiveness of measures controlling traffic pollutions and apply regulatory measures in cases where air pollution exceeds defined limits

12) Action – Limit dust production

Develop an optimised system for cleaning of roads, sidewalks and public spaces in order to reduce dust, especially during dry and windy periods

13) Action - Support public transport development and use of its electric traction

Encourage electro-mobility and its usage for public transport and other communal services

14) Action - Use alternative fuels (LPG, CNG)

Based on experience from other cities, support usage of alternative fuels (LPG, CNG) in new vehicles and/or conversion of existing engines

15) Action – Implement low-emission zones

Develop low-emission zones in the city allowing entry only for vehicles fulfilling EURO standards for emissions and propose alternative routes for bypasses

16) Action – Implement the parking scheme

Support establishment of large-capacity parking premises at main transfer links (railway stations, docks), support the Park and Go system around the city centre perimeter and Kiss and Ride premises in the city centre, primarily at schools, pre-schools, train stations, etc.

17) Action – Eliminate noise and pollution generated by the dock Vaňov

Address the transport solution for the public dock Vaňov in terms of construction-technical measures, traffic calming and suitable transport links to the road network in the city

4.5.9.3 Prevention of Problem

Traffic organisation

- Actions 1, 3, 9, 10, 14, 15, 16

Technical equipment of the vehicle fleet and the transport infrastructure

- Actions 2, 4, 5, 12, 13

Barriers

- Actions 6, 7, 11

4.5.9.4 Restrictions

- Action 10
- Prepare a regulatory plan for traffic restrictions applicable on the busiest roads in case of exceeding the acceptable pollution levels

Promotion and raising awareness to prevent negative environmental impacts

- Organisation actions: 1, 3, 8, 9, 11, 13, 15, 16
- Technical actions: 2, 4, 5, 6, 7, 12, 14

Control and monitoring

- Realised by the Hydro-Meteorological Institute of the Czech Republic in cooperation with the city

Financial and personnel resources

- Ensure adequate financial and personnel resources for implementation of proposed actions

Time schedule

18) Create a time schedule for individual actions of the action Plan in order to fulfil short and long-term objectives

Action from the Action Plan for ENVIRONMENTAL PROTECTION	*
Responsibility and person in charge	*
Personnel resources	*
Financing	*
Time schedule	*

** to be fill in be a city authority responsible for transport for each year*

5 Conclusion

The SUTP, if approved by the city, will become an official strategic document and a basis for future development of transport in the city in the following decades.

The original document is currently undergoing revision from city authorities, which may result in certain changes in the text, such as omission of certain solutions or provision of more details to different solutions.

There will be no completely different transport solutions added to the document.

The vision is that each year, depending on the city budget and elected City Government, the responsible person will commit to implement specific actions defined in the Action Plans and will submit the plan for the implementation.

Specific responsibilities and time schedules for the groups of actions from individual action plans of the SUTP will be assigned by City Council during the approval process starting in November 2012. After the outlined SUTP is accepted (presumably at the end of the year 2012), specific actions, financing of these actions and time schedules for individual steps will be defined each year by responsible bodies identified in the document.

Moreover, financing for the actions will be assigned individually depending on each year city budget and goals set for the year. The document only points out priorities, which require to be focused on primarily.

The full version of the SUTP in the Czech language is the Annex to this document.