FINAL EVALUATION REPORT

GDYNIA

Authors:

Name	Partner Institution/Company
Joanna Jankowska	Municipality of Gdynia

Peer Reviewer(s):

Name	Partner Institution/Company	Revision Date
Hans – Joachim Becker	Technical University Berlin, IVP	30.November 2005

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Abbreviations

CO	Carbon monoxide
CO_2	Carbon dioxide
ITEMS	Integrated Transport Effects Modelling System
LEM	Local Evaluation Manager(s)
MAESTRO	Monitoring Assessment and Evaluation of Transport Policy Option in Europe
METEOR	Monitoring and Evaluation of Transport and Energy Oriented Radical strategies for clean urban transport
TELLUS	Transport & Environment aLLiance for Urban Sustainability
TEP	TELLUS Evaluation Plan
DOAS	Differential Optical Absorption Spectroscopy
ARMAAG	Agencja Regionalnego Monitoringu Atmosfery Aglomeracji Gdańskiej [Agency of Regional Air Quality Monitoring in Gdańsk]
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
SO_2	Sulphur dioxide
PM_{10}	Particular matters
LEP	Local Evaluation Plan
EEA	European Environment Agency
TERM	Transport and Environment Reporting Mechanism
EST (OECD)	Environmentally Sustainable Transport (Organisation for Economic Co-operation and Development)
CSD	Commission on Sustainable Development
NFP	The Netherlands Fellowship Programmes
PT	Public Transport
ERDF	European Regional Development Fund
CORINAIR	Core Inventory of Air Pollution
ZKM	Zarząd Komunikacji Miejskiej w Gdyni [Public Transport Authority in Gdynia]
M	million
TKI	TELLUS Key Indicator(s)
CCI	Common Core Indicator(s)

A INTRODUCTION

A.1 General Remarks

The Evaluation Report provides an overview of the evaluation activities carried out during the life cycle of the TELLUS Project in Gdynia. These activities are elaborated on the basis of the methodology proposed by the TELLUS Evaluation Plan, processed information gained from the TELLUS Inception Report, intensive consultations with the demonstrators and data collected by means of surveys and measurements.

The Final Evaluation Report provides information on:

- the implementation process of the measure;
- which frame conditions promoted or hindered the success of the measure;
- the grade to which the stated objectives have been achieved by the demonstration measure;
- the development of the TELLUS Key Indicators and
- to what extent the demonstration measure contributed to the TELLUS quantified objectives.

The Evaluation Report is structured as follows: Part A ‘Introduction’, Part B ‘Evaluation on Demonstration Measure Level’, Part C ‘Evaluation on City Level’, Part D ‘Final Conclusions’, and an ANNEX.

Part A introduces the TELLUS landscape in Gdynia, the type and strategy of the demonstration measure and the geographical context addressed. Furthermore it is explained how the measure fits in with the overall transport strategy of the city. Part A is completed by a brief introduction of the different actors constituting the local evaluation team.

Part B contains the evaluation of the demonstration measure. However, since the measure will not be finished within time frames of the TELLUS Project some forecasts are inevitable.

Part C, the evaluation on city level contains the actual development of the TELLUS Key Indicators as well as METEOR Common Core Indicators. Furthermore the contribution of TELLUS to the transport policy is explained. Finally a look into the near future (ex-ante evaluation 2010) is presented in this part.

Part D draws conclusions on the implementation of the demonstration measure in Gdynia.

The ANNEX contains demonstration measure - related indicator lists, TELLUS Key Indicators, an example of a survey and METEOR-related indicator lists.

A.2 TELLUS landscape in Gdynia

Gdynia has a population of 253,000 inhabitants and spreads on the area of 136 km^2. It is located in the northern part of Poland, directly at the Gdańsk Bay and between the cities of Sopot, Gdańsk and Rumia. Gdynia has convenient transport connections with the main cities of Poland, Scandinavia, Lithuania and the Kaliningrad District. It can be easily accessed by train, ferry, aeroplane (Lech Wałęsa Airport in Gdańsk) and coach. The city centre is located close to the sea and borders of the southern part of the port zone.

Gdynia is a city of maritime traditions and origins so its development strategies are closely linked with maritime economy. The development directions were defined by the town's coastal location, therefore a significant role in its overall economy is played by shipyards, port handling activities, and all maritime back-up services. The biggest maritime enterprises closely co-operate with a number of smaller ones. This sector employs about 30% of the city residents. Other important sectors of the city's economy are the hi-tech branch, finances and services.

The spatial development of the city is determined by natural limitations: the Gdańsk Bay and the natural forestry reserves – "Tri-city Landscape Park". These factors decided on the city extension to the west.

Natural conditions determine also the great role of transport in daily life. New city districts are located rather far from the city centre, and therefore the inhabitants have to use various means of transport to move from one district to another one. The most of the transportation lines as well as PT routes go through and closely to the city centre.

1 Demonstration measure

1.1 Status and type

The Gdynia part of the TELLUS Project consists of one demonstration measure that deals with the implementation of technical innovations and puts emphasis on activities that focus on the development and implementation of social changes.

Table 1: TELLUS Demonstration measure in Gdynia

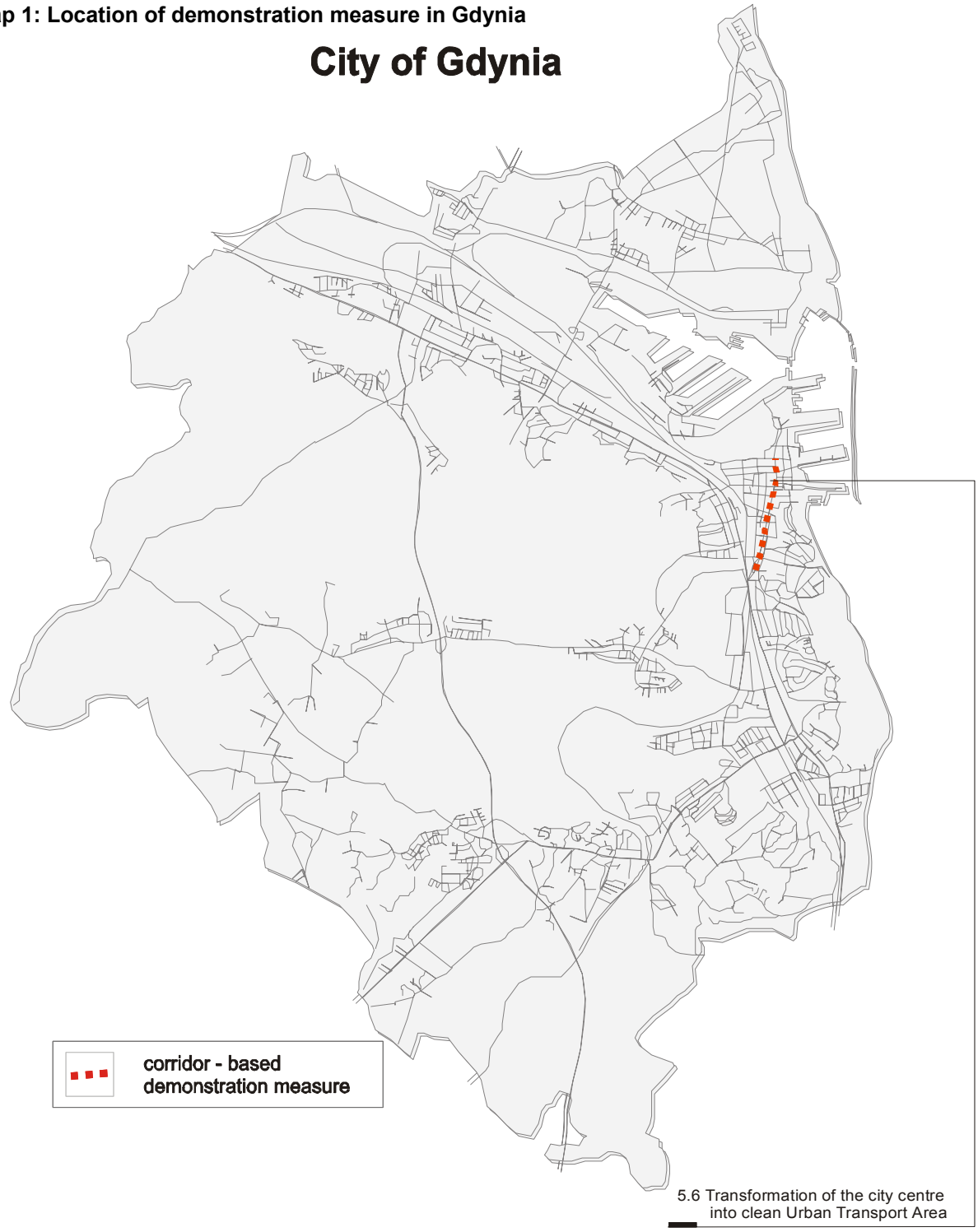
Name of demonstration measure	Type of demonstration measure	Strategy	Policy
5.6 Transformation of the City Centre into the Clean Urban Transport Area	Implementation [Implementation of the environment friendly PT technology and access restrictions for motorized private vehicles].	Improvement the city's public transportation system. Enhance the quality of life.	Decrease of private vehicle usage in favour of PT.

1.2 Geographical context

Regarding its geographical context the demonstration measure in Gdynia is a corridor-based type. The undertaking regards modernization of the main city street (Świętojańska Street) located in the down town relatively close to the sea shore and already existing pedestrian areas. The route runs also along the key city's transport arteries.

The geographical context of the demonstration measure is relevant for the reference area of the impact-related evaluation. The corridor-based demonstration measure is expected to hold impact along the corridor area. This is important when it comes to evaluate the impacts for the measure level as well as for the summative evaluation on city level.

Map 1: Location of demonstration measure in Gdynia



2 Work packages

Gdynia participates in the TELLUS Project with a measure situated in the Work package 5 "Access restriction". In table 2 the objectives of the WP are stated as well as the number of the Gdynia-related demonstration measure approaching them. Since these objectives are congruent with the Gdynia's TELLUS objectives "Reduce air pollution and noise to levels below national and EC directives", "Reduce congestion by 5% (10%)" and "Achieve extensive political and public awareness for TELLUS" as well as demonstration measure objectives they will be evaluated within the scope of the evaluation on demonstration measure level.

Table 2: Objectives on WP-level (Gdynia)

WP	WP objectives	Approached by measure
Access restriction	Promoting clean modes of transport and reduction of emission in the city centre.	5.6

3 Integration into local transport policy

The TELLUS demonstration measure in Gdynia is not an isolated attempt to organise urban transport in a more sustainable way but a part of an integrated local transport policy described in the main strategy of the city as well as certain plans concerning transport management and development.

The objectives of the TELLUS Project correspond with the main goals of these documents. The most important of them are:

- The "Strategic Plan for Development of Gdynia"[1],
- Gdynia's "Transport Policy"[2]
- „Integrated Development Plan of Public Transport in Gdynia for years 2004-2013"[3]

The "Strategic Plan for Development of Gdynia" highlights on the following tasks concerning the transport system in the city: "modernization of infrastructure network", "improvement in the city's public transportation system". Its updated version also includes the objectives which will result in creating integrated and efficient urban transport system. The transportation part outlines ensuring the efficient and environment friendly urban transportation system through, among others, **encouraging the inhabitants to use the**

[1] Source: Resolution of the City Council of Gdynia no IX/182/03 of 25th March 2003 on passing the "Strategic Plan for Development of Gdynia" updated (http://www.gdynia.pl/?co=strategia).

[2] Source: Resolution of the City Council of Gdynia no XLII/728/98 of 25th February 1998 concerning transport policy of the City of Gdynia.

[3] Source: Resolution of the City Council of Gdynia no XVII/366/04 of February 2004 on passing the „Integrated Development Plan of Public Transport in Gdynia for years 2004-2013".

public transport through improving its quality and increasing the diversity of transportation services and development of the trolley-bus transport as environment friendly that are consistent with the aims of the TELLUS Project.

In Gdynia's "Transport Policy" Paper the main goals are sustainable development of the city and efficient, integrated as well as safe transport of passengers and goods. These aims are being achieved through modern methods of organizing public transportation and thorough modernization of the city's road network. The transport policy focuses on creating transportation junctions in the vicinity of most important railway stations in Gdynia and Tri-city and also on integration of inner urban transportation system ensuring the citizens efficient links to all the districts of Gdynia. Other goals to achieve are: **limiting the use of private vehicles in the city centre in favour of alternative means of transport and development of a strategy of parking places accessibility in the city and development of the trolley-bus transport.** The "Transport Policy" is being constantly implemented, also through main road investments realized within the confines of "Road Programme 1998-2002". The main undertaking of this Programme realized in stages is a construction of the "Różowa Road" – alternative route to the existing Tri-city arteries. It is planned to be finished until the end of 2006 with about € 30 M of total cost.

The newly passed „Integrated Development Plan of Public Transport in Gdynia for years 2004-2013" contributes to the idea of sustainable development aiming at creation of conditions to efficient and safe transport of passengers and goods together with securing priority to PT and reducing transportation effects damaging to environment.

During the TELLUS Project lifetime Poland became a member of the European Union. Consequently some plans concerning transport system in Gdynia became more possible to be realized. Two key transport Projects for the improvement of the traffic situation in Gdynia are the "Construction of the Kwiatkowski Route in Gdynia – III stage" and the "Extension of the Janek Wiśniewski Street in Gdynia – phase II". They are co-financed by ERDF with € 51.6 M and will be completed till 2007.

Their implementation will change radically road traffic situation in Gdynia.

Moreover the Project "Development of the environment friendly Public Transport in Gdynia" were granted with € 4.5 M. Until 2006 new trolley-bus depot, terminus and lines (10.6 km) will be constructed within the Project. Additionally 10 new modern trolley-buses will be purchased.

Another very important investment for the city which will have unprecedented impact on the traffic conditions and on air quality is creation of an integrated system of traffic management on the whole area of Gdynia. Some undertaking included in the „Integrated Development Plan of Public Transport in Gdynia for years 2004-2013" such as construction of the Park and Ride park in Gdynia Redłowo (to connect road and rail transport) are being implemented currently and by 2010 the system will probably have certain functionality. Additionally another

8.5 km of the new trolley-bus lines and 7 Park and Ride places are planned to be built till 2013.

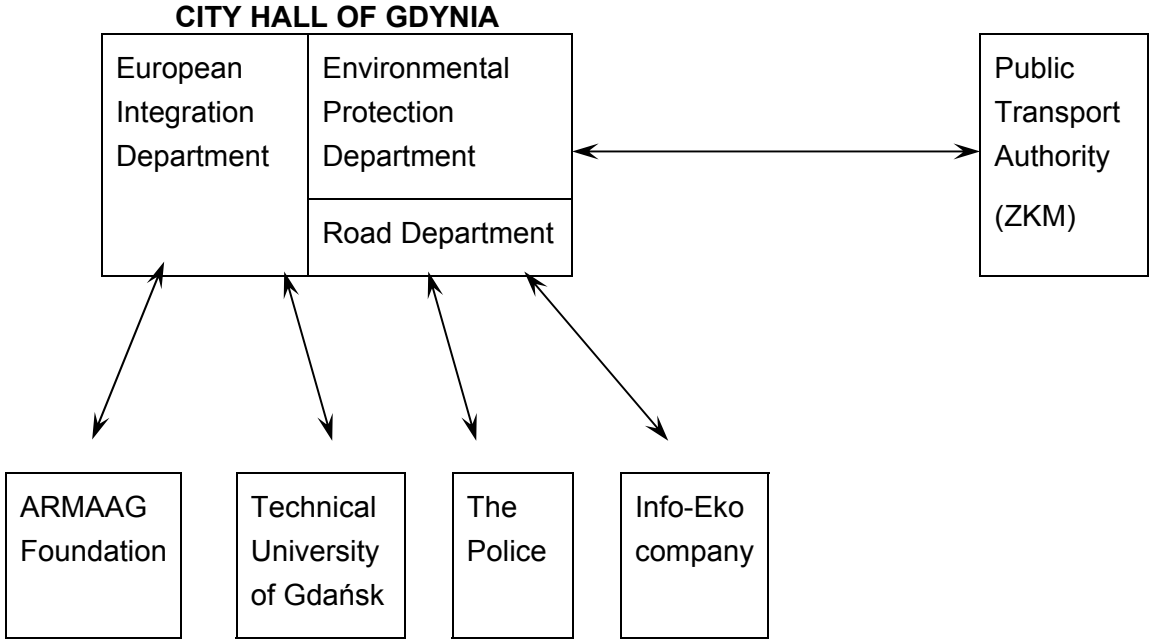
Having in mind all the transport investments going on simultaneously together with the TELLUS Project and the relatively small area of influence of the TELLUS measure in Gdynia the demonstration measure will be evaluated on the measure level. On the city level description of the situation showing influence of all planned and currently constructed transport investments will be provided.

4 Actors of evaluation

The evaluation in Gdynia has been carried out by various actors - mainly by the European Integration Department in co-operation with the Environmental Protection Department and the Road Department (City Hall of Gdynia). The Public Transport Authority (ZKM), a municipal unit created to manage the collective passenger transport, has taken also significant part in the evaluation.

To provide consistent and reliable data ARMAAG Foundation and the Police as well as external experts from the Technical University of Gdańsk and Info-Eko company were partially involved. Local Evaluation Manager (European Integration Department) has been responsible for coordination of the monitoring and evaluation activities stated in the indicator list as well as providing Gdynia's part for the TELLUS reports.

Figure 1: Actors of evaluation in Gdynia



B EVALUATION ON DEMONSTRATION MEASURE LEVEL

B.1 Approach

1 General

The following chapter gives an outline of the criteria against which the demonstration measure in Gdynia has been evaluated.

Part B contains the evaluation report on the demonstration measure level. It starts with an introductory part providing a brief outline of the evaluation criteria, an explanation of the meaning and different levels of the objectives as well as brief remarks on the various spheres of evaluation (process, impact). The following chapters present the evaluation of the measure itself.

The **introduction** gives brief reference to the type, strategy and policy context of the measure as well as first information on the demonstrator and, if applicable, modifications to the original plan or strategy.

The **description of the demonstration measure** outlines the original demonstration design as stated in the DoW, the transport plan context and the different level objectives as provided in the TELLUS Evaluation Plan. It concludes with a brief description of the situation before TELLUS.

The third chapter contains the actual **implementation process** of the measure as undertaken throughout its life cycle.

Chapter 4 provides **results** of the evaluation, in particular with regard to the impact evaluation. The respective part of the chapter is sub-divided into first, a description of the evaluation methods, and second, the impacts themselves clustered around the evaluation areas that apply to the measure. The impact section also contains information on the effects the measure had on the public awareness regarding TELLUS. Following the provisions of the Local Evaluation Plan, the awareness impact is evaluated indirectly through media response and other events, which helped to make TELLUS known to a wider public.

The **conclusion** chapter aims at identifying drivers and barriers that either promoted or else hindered the implementation and/or success of the measure. The drivers and barriers refer to both, events and circumstances directly related to the measure itself, or else framework conditions, which turned out to play an important role. What is more, this chapter also includes the resume with an overview of the grade of achievement of the immediate, intermediate and ultimate objectives.

Scenario is described based on the future plans of the City.

Finally, **recommendations** built on the results of the evaluation and lessons learnt by the actors are given.

By and large, there are three different fields of evaluation considered for this report: the impact related evaluation, the process related evaluation and the objectives-related evaluation.

1.1 Objectives

The objectives of the demonstration measure are divided into three levels.

Immediate objectives (demonstration measure-related objectives)

Immediate objectives are the objectives that are directly related to the implementation of the demonstration measure. They concern the actions to be undertaken during the implementation of the demonstration measure.

These objectives are taken from the description of work and are supplemented with information from interviews with the demonstrator. The objectives are going to be monitored during the life cycle of the demonstration measure in the so-called process- and impact-related evaluation.

Intermediate objectives

Intermediate objectives relate to the effects that were expected to be caused by the implemented measure. In most cases they are associated with a wider implementation and can serve as a logical link between the demonstration measure-related implementation objectives and the TELLUS quantified objectives on city level.

The intermediate objectives are worked out by the Local Evaluation Manager and the demonstrators.

A majority of these intermediate objectives have not been monitored formally within TELLUS because the wider introduction of the demonstration measure is not part of its life cycle. To close the information gap arising from this scenario will be used.

Ultimate objectives

The ultimate objectives refer to the desired long-term impacts of the measure. In many cases, these objectives are identical with the TELLUS quantified objectives and have been therefore monitored within the TELLUS objectives-related evaluation.

1.2 Impact-related evaluation

To answer guiding question 1 “Did the demonstration measure achieve the desired effects?” the impact-related evaluation is carried out.

The tables presented in this part show the evaluation area, evaluation category, impacts and indicators considered relevant for the assessment of the demonstration measure.

The list is based on the MAESTRO impact/indicator tables and was worked out in a discussion process between evaluation actors.

However, the progress is subject to various alterable frame conditions, which can be the reason for barriers of implementation and related delays (see process-related evaluation).

1.3 Process-related evaluation

To answer guiding question 2 “Did the demonstration measure provide services, products and other benefits as planned?” the process-related evaluation has been carried out.

The chapter gives an overview of the sources of ongoing monitoring with their due-dates relevant for the process-related evaluation. This comprises the Milestones of the demonstration measure as well as all Management Reports (MR), Progress Reports (PR) and Result Reports (RR) published during its life cycle.

Furthermore, the barriers that could affect a successful implementation of the measures are listed.

This information was taken from interviews with the demonstrators and the Inception Report.

1.4 TELLUS objectives-related evaluation

In this part the approach of assessing the contribution of the respective demonstration measure to the TELLUS quantified objectives is lined out. Carrying out this evaluation can answer guiding question 3 “Did the individual measure contribute to the TELLUS objectives?“.

Since the quantification of the TELLUS objectives distinguishes between two different time frames (2002-2006 and 2006-2010), the objectives relevant for the demonstration measure are stated according to this division.

Until 2006

Part one deals with the objectives relevant for the demonstration measure in the time frame 2002 – 2006. There it is clarified which indicators from the impact-related evaluation are used to answer Q 3 “Did the demonstration measure contribute to the TELLUS objectives”.

Until 2010

The second part refers to the time frame 2006 – 2010. Since these dates are beyond the TELLUS life cycle, the contribution of the demonstration measure to the TELLUS objectives stated there can only be estimated. This has been done by scenario developed by the Local Evaluation Manager.

1.5 Environmental evaluation

The general superior approach to determine the ecological effects of the demonstration measure in Gdynia has been described in the following chapter. As a basic principle, the impact categories:

- air quality and
- noise

are evaluated by quantifying the changes which result from the implementation of the measure so comparison of situation before and after each stage of implementation as well as after the whole works is necessary. The environmental Key Indicators of these impact categories, as being analysed in Gdynia, can be found in the table 3.

Table 3: Environmental key indicators for TELLUS measure in Gdynia

Impact category	Environmental key indicator	Un Unit
Pollution/ Air quality	PM_{10} concentration in selected area NO_2 concentration in selected area CO concentration in selected area	µg/m³ µg/m³ mg/m³
Nuisance/Noise	Noise levels at the demo area	dB

Apart from the TELLUS Key Indicators for the demonstration measure in Gdynia, some of the emissions are also going to be calculated in the beginning and at the end of the demonstration measure.

Air quality

It is presumed that the measure implemented in Gdynia has been reducing the air pollution in the city centre. However, it is not practicable or reasonable, within the scope of the TELLUS evaluation, to determine the effects of the measure on the air quality covering the whole area of Gdynia due to the following reasons:

i. there exists an extensive measuring network collecting air pollution data in Gdynia (see Map 2), but its stations do not measure the specific contribution of traffic,

ii. the laboratory area of the demonstration measure is in a significant distance from each station.

The automatic measuring points are available in three places in Gdynia (stations number 4, 9 and 10). These stations belong to the ARMAAG Foundation, owned by the municipalities of Tczew, Gdańsk, Sopot and Gdynia. The Foundation aim is to create the regional air monitoring network.

Its stations are located in specially chosen points, which are considered as representative for the air quality or are known as so called “hot points”, meaning unusually high air pollution concentration.

Station no. 4 is located in the northern part of the city, while no. 10 is close to the Port in the centre of the city and no. 9 more in the southern area.

Data from the stations no. 9 and no. 4 has been used as only they are collecting data on all TELLUS indicators concerning air quality for Gdynia. The ARMAAG Foundation has in its archives the following annual data for the year 2001:

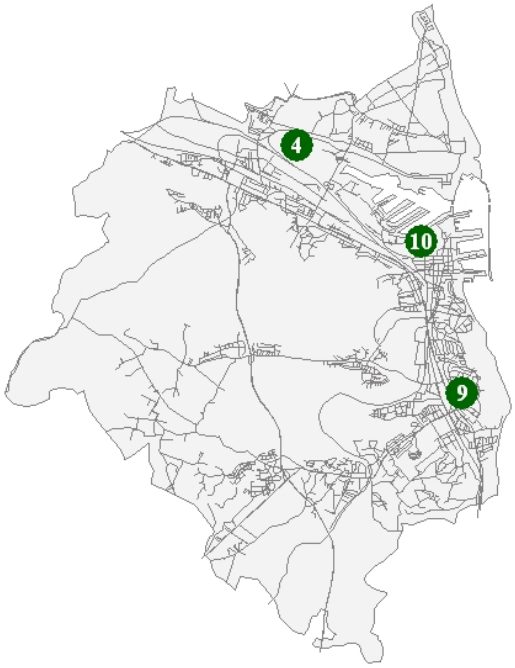
- particulate levels (PM_{10}),
- SO_2 levels;
- CO levels;
- NO_2 levels;
- NO_x levels.

In case of ozone levels the data is also available, however the method of measuring (period of measuring, etc.) changed and it has not been possible anymore to compare the data.

Since the automatic monitoring stations are not located in the laboratory area itself but in a certain distance, the air pollution indicators may be influenced by other factors not only the implemented measure.

The ARMAAG Foundation has in its possession also movable DOAS (Differential Optical Absorption Spectroscopy) equipment which could be used to show the exact changes in air pollution in the laboratory area and has been used to calculate emissions.

Map 2: Locations of the ARMAAG Foundation measuring stations in Gdynia (NO_2; CO; PM_{10}; SO_2; NO_x)



Emissions

The emissions calculations for the demonstration measure were carried out on the basis of the traffic intensity during three measuring periods (encompassing 3 full weeks) and the global indicators of emissions for the city traffic used by the European system of emission evidence CORINAIR. The effects were compared with simultaneously carried out measurements of the air pollution with the use of DOAS equipment (Differential Optical Absorption Spectroscopy) and then emissions calculations of particular contaminant were carried out.

To calculate the emissions the structure of the traffic had to be taken into account as well. The following data might be obtained: CO_2, CO, SO_2, NO_x, CH_4, Pb, Benzene and specific hydrocarbons known to be health hazard (all in μg per vehicle kilometer).

The DOAS equipment measurement is based on comparison of the spectrum of the standard light beam of a defined intensity with the spectrum of the light beam after traversing a precisely defined distance through the atmospheric environment being the object of the exploration. The light traversing the atmosphere changes its characteristics depending on the kinds and levels of the pollutants. Each of the substances in the air leaves its own trace in the spectral characteristic, thanks to which after comparing the picture with the standard spectrum one may very precisely define the composition of the air and pollutants.

Unfortunately the city does not have relevant data from before the Project obtained from this equipment. The latest data is from March till June 2002 and has been treated as a baseline, but it should be taken in mind that since the other part of the street was closed at this time for

the modernization, the traffic was lower than usual and data can be lower than it would be with the street open to the normal traffic.

Since the equipment is owned by four Municipalities, and this is the only device in northern Poland only one measurement was done at the end of the TELLUS Project.

Noise

The noise calculations for the demonstration measure were carried out using the representative periods of road noise research; the equivalent noise level L_{Aeq} was estimated on the basis of so called “representative periods of research”.

One of the methods is characterizing the representative periods on the basis of the hour-long intensity and structure of traffic in the section of the road artery being under research.

Such a diagnosis should be done on the basis of measurement of traffic parameters. Measuring points were located near the facades of chosen buildings located at the lately modernised part of the street after each stage of modernization. To describe the research period, representative for the time of reference, the division of hours was made. During those hours the traffic intensity did not differ more than 25% and the difference in heavy traffic wasn’t bigger than 10% (hour distinction: from 1.00 to 5.00 p.m., from 7.00 to 9.00 p.m. and from 10.00 to 11.00 p.m.).

B.2 Demonstration measure 5.6 – Transformation of the City Centre into the Clean Urban Transport Area

1 Introduction

The TELLUS demonstration measure in Gdynia is the corridor-based type and is located in a central, down town area and has a limited impact on the whole city. It regards modernization of the Świętojańska Street - main city street located in the down town relatively close to the sea shore and already existing pedestrian areas. The route runs along the key transport city's arteries.

Through implementation of the measure Gdynia wishes to transform the city centre into a clean urban transport area with impacts on transport, environment and society areas.

The measure has been evaluated regarding two main aspects. Assessment of all relevant impacts of the measure (impact-related evaluation) as well as of the frame conditions promoting or limiting these impacts (process-related evaluation).

The TELLUS demonstration measure is one out of many other transport related measures implemented by local authorities leading to very significant improvement of traffic conditions within the whole area of Gdynia. The environmental effect of the TELLUS measure on the city level conditions when compared with those investments will be very slight.

Figure 2: Świętojańska Street in 40s and now (2005)

2 Description of demonstration measure

The TELLUS demonstration measure in Gdynia has been implemented within Work package 5 - "Access restriction". The measure has referred to the modernization of the main city street (Świętojańska Street) in such a way to make it more citizen and tourist friendly. Main actions have been connected with reorganisation of the traffic, softly discouraging private vehicles users from going to the street by their cars, better quality of public transport and improved conditions for spending leisure time.

Many public utility institutions such as the City Hall are situated on the street or in the adjacent area. The Street with small retailers and restaurants constitutes a specific leisure

area where the inhabitants of Gdynia and many visitors tend to spend their free time, go shopping etc.

2.1 Demonstration design

The modernization of the Świętojańska Street was divided into three stages (first phase: from the 10 Lutego Street to the Żwirki i Wigury Street; second: from the Źwirki i Wigury to the Marsz. Piłsudskiego Avenue and the last one: from the 10 Lutego to the Kaszubski Square) to avoid significant inconvenience for businesses and residents. The necessary preparatory works before realization of each part consisted of:

- preparation of all indispensable documents needed for starting the public procurement procedure,
- preparation and carrying out of the tender,
- selection of the consortium of companies responsible for modernising the street,
- selection of the company responsible for the investor's supervision of the modernization by means of tender procedure.

The modernization work covered a wide range of tasks financed by different sources. Tasks such as renovation of the underground installation removal of colliding infrastructure, widening of the pavements, renewal of the street surface have been financed by local authorities. Installation of elements organising and limiting traffic for the time of modernization; installation of a new, more reliable trolley-bus traction attached to new pillars; purchase and installation of bollards and installation of the bicycle stands have been implemented within the TELLUS Project.

Moreover the Public Transport Authority has been conducting a wide promotion of PT as an important part of the TELLUS Project in Gdynia.

Up to October 2005 two out of three stages were completed. However, due to financial limits (the total costs of modernization, including works outside the TELLUS Project, are very high) the authorities had to decide on later commencement of works. The last stage, which appeared to be more difficult and more expensive than the others, will be finalised in 2006, a couple of months after the TELLUS Project ends. Contract for the work on the third stage of modernization was put out to tender and the date for the official opening of offers submitted was appointed at 16th November 2005.

Each stage of modernization was facilitated by the transport management plan solving the transportation problems resulting from temporary closing of the street for PT.

2.2 Transport Plan context

Within the Gdynia local transport policy the TELLUS demonstration measure 'Transformation of the City Centre into the Clean Urban Transport Area' has been compatible with a number

of activities encouraging the inhabitants to use the public transport through improving its quality and increasing the diversity of transportation services by development of the trolley-bus transport as environment friendly to achieve a modal shift favouring public transport.

Moreover all transport investments planned to be implemented and currently under construction will contribute directly or indirectly to decrease the use of private vehicles in the city centre.

The measure is a part of the city centre strategy aiming at limiting the use of private vehicles in the down town in favour of alternative means of transport, development of parking management policy as well as promotion of trolley-bus transport.

2.3 Objectives

The modernization of the Świętojańska Street has been contributing to the following objectives:

Immediate objectives

- Modernized trolley-bus traction and its adjustment to the inhabitants' traffic,
- Reorganization of parking places.

These objectives are directly related to the implementation of the demonstration measure. Their monitoring has been carrying out during the life cycle of the demonstration measure in the process- and impact-related evaluation.

Intermediate objectives

- Increased number of pedestrians and bicycle riders in the city centre,
- Increased number of trolley—bus users,
- Low number of private vehicles entering the clean city centre area,
- Appearance of various forms of new initiatives in the service sector related to the leisure activities in the main street.

These objectives relate to the effects that have been expected to be caused by the implemented measure.

The ultimate objectives refer to the desired long-term impacts of the measure.

- Reduce congestion,
- Reduce air pollution and noise to levels below national and EC directives,
- Improve intra-organisational co-operation at the city level,
- Achieve extensive political and public awareness for TELLUS.

In case of Gdynia's measure these objectives are identical with the TELLUS quantified objectives and therefore have been monitored within the TELLUS objective-related evaluation.

Table 4 shows those TELLUS objectives set for the life cycle of the Project until 2006 and 2010 (ultimate objectives) beyond the end of CIVITAS I.

Table 4: TELLUS quantified (ultimate) objectives for 2006/2010 for Gdynia

Objectives for 2006	Objectives for 2010
Reduce congestion by 5%	Reduce congestion by 10%
Reduce air pollution and noise to levels below national and EC directives	Reduce air pollution and noise to levels below national and EC directives
Improve intra-organisational co-operation at the city level	Improve intra-organisational co-operation at the city level
Achieve extensive political and public awareness for TELLUS	Achieve extensive political and public awareness for TELLUS

2.4 Situation before TELLUS

Before the TELLUS Project the city centre was constantly overloaded. Private vehicles were parked on both sides of the main city street. The traction constructed in early 60s was mostly attached to the walls of the buildings which caused vibrations and increased the noise level both in the houses and in the street. This type of traction also caused trolley bus breakdowns and stops blocking traffic in the Świętojańska Street and leading to congestion and higher air pollution.

Due to the lack of bicycle holders and congestion owing to private vehicles traffic it was impossible to encourage the inhabitants to use bicycles as a mode of transport to go shopping or for leisure activities in the city centre.

The demonstration measure in Gdynia has been a part of modernization strategy in the city centre and has been encompassing the following main elements:

- installation of the new trolley-bus traction and its adjustment to the inhabitants' traffic - previously the old defective trolley-bus traction from early 60th was fastened to walls of buildings causing their deterioration and transmitting vibration into particular apartments (see Figure 3: Trolley-bus traction)

Figure 3: Trolley-bus traction

- reorganisation of parking places (installation of the road guards limiting parking in forbidden areas) – before the TELLUS Project vehicles could be parked almost everywhere, often blocking the pedestrian pavement (see Figure 4: Wild parking);

Figure 4: Wild parking

- equipping the Street with spatial elements of small architecture related to the public and bicycle traffic (e.g. the fixed bicycle holders – see Figure 5: Bicycle holders) - previously there were no possibility to leave the bicycle.

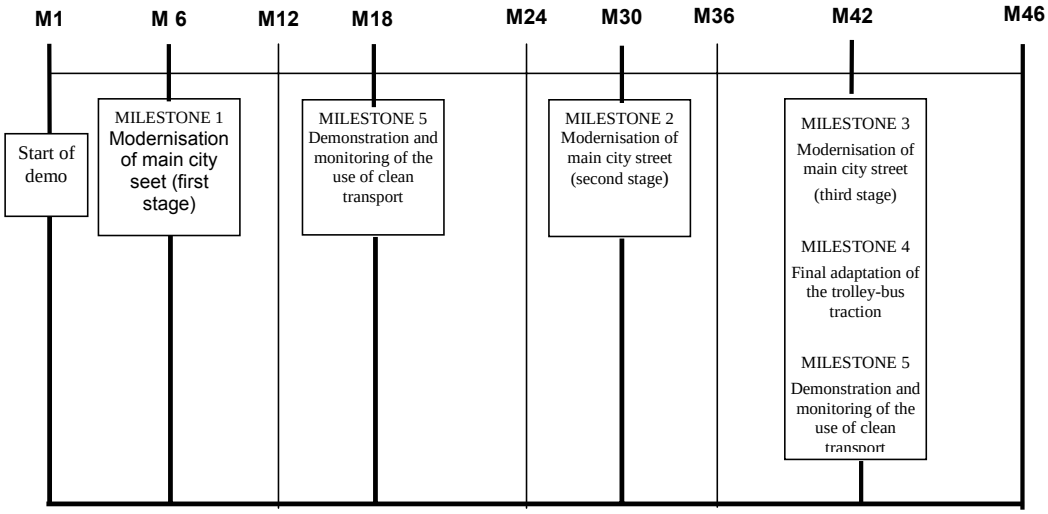
Figure 5: Bicycle holders

3 Implementation Process

Introduction

To guarantee the most proper realization of the demonstration measure precise criteria were outlined against which the measure has been evaluated. Starting with an overview of the main objectives and activities within the demonstration measure, indicators were developed to carry out the assessment of the measure. Ongoing monitoring for the process-related evaluation has been carried out using milestones of the demonstration measure as well as all Management Reports (MR) and Progress Reports (PR) published during its life cycle. Most information has been taken from interviews with the demonstrator and the Inception Report.

Figure 6: Milestones



Risks related to modernization

The modernization of the Świętojańska Street in the Gdynia centre needs to have a critical look at two types of risks – the financial risk and the acceptance risk.

- The implementation of the measure has been depending on construction works such as underground installation, renewal of the street surface, widening of the pavements, not included in the demonstration measure which needs be carried out before each stage of modernization (tasks envisaged in the Project). The costs of the complete modernization of the street are huge amounting to about € 8 million.
- The success of the measure has been depending on acceptance level of the modernized Świętojańska Street by its inhabitants, the shopkeepers and owners of the pubs, restaurants, open-air cafes; furthermore the acceptance of the PT by users as well as the acceptance of the reorganized parking system by the private car users play an important role.

Modernization

The modernization of the Świętojańska Street has been implemented within three stages dividing the Street into three manageable sections.

The necessary preparatory works before realization of each part consist of:

- preparation of all indispensable documents needed for starting the public procurement procedure,
- preparation and putting work out to tender (for subcontractor),
- selection of the consortium of companies/company responsible for modernising the street (subcontractor),
- selection of the company responsible for the investor's supervision of the modernization by means of tender procedure.

For all this tasks the Road Department of the City Hall of Gdynia is responsible and stay in a continuous contact with the European Integration Department (Site Manager and Local Evaluation Manager) to ensure proper and smooth accomplishment. No significant obstacles or disturbances have occurred during realization of the preparatory works before two first stages. Contract for the work on the third stage of modernization was put out to tender and the date for the official opening of submitted offers was appointed at 16th November 2005. Taking into account national public procurement act (conformable to EU law) and appeal procedures it is difficult to determine when the subcontractor will start. Completion of works is planned on the second quarter of 2006. The first stage of modernization was subcontracted to Firma Budowlano-Drogowa MTM S.A. company and for implementation of the second stage a consortium of companies (Firma Budowlano-Drogowa MTM S.A. and Przedsiębiorstwo Drogowe "Gdynia" sp. z o.o.) was chosen. As it was mentioned above subcontractors were selected by means of tender procedure.

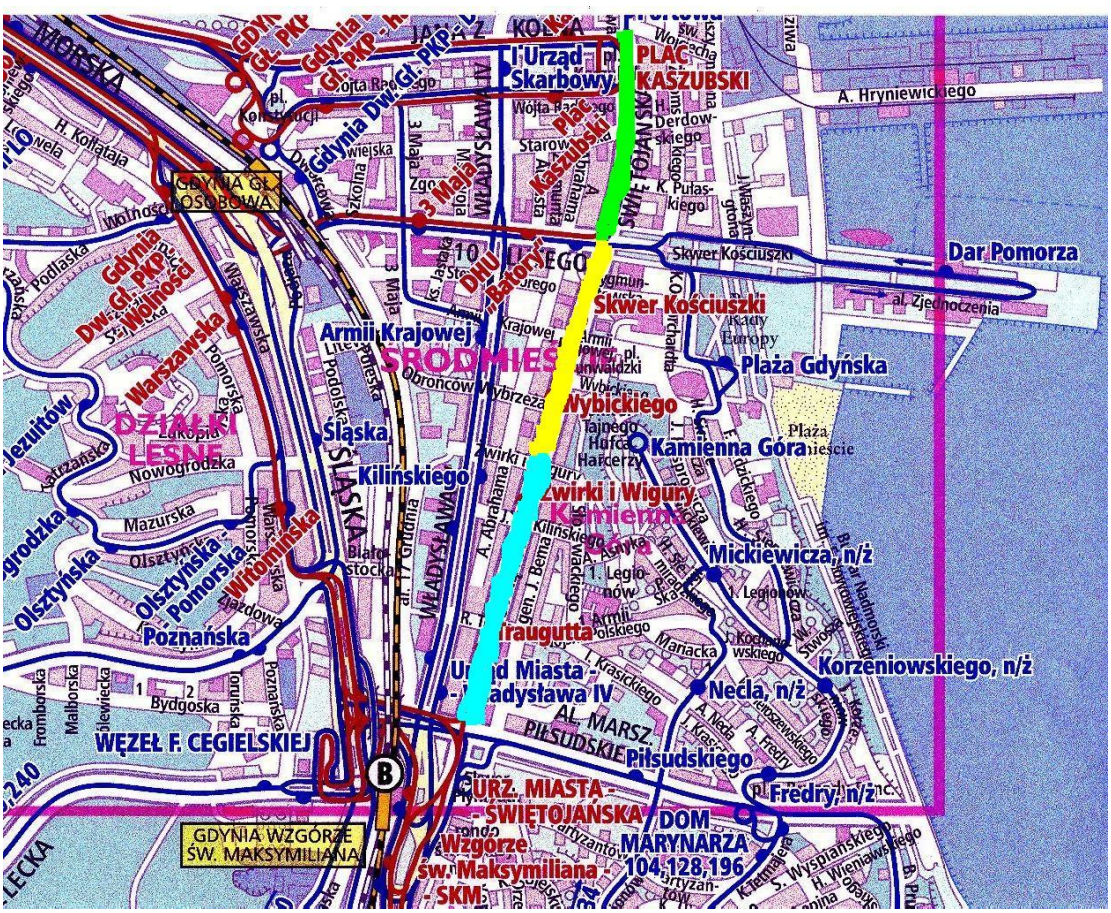
Stage one

Stage one covered the section of 625 metres between 10 Lutego Street to Żwirki i Wigury Street (see yellow line at the **Map 3**). The modernization started with tasks not budgeted by the measure (without which the measure could not be implemented), namely renewal of the underground installation, widening of the pavements, renewal of the street surface, etc. Then tasks envisaged in the measure were realized i.e.: installation of a new, more reliable trolley-bus traction attached to new pillars instead of the walls of buildings (1,740 metres of traction and 68 pillars); purchase of 491 bollards together with their installation to limit illegal parking possibilities and allow for more convenient PT traffic; installation of elements organising and limiting traffic for the time of modernization; installation of the 6 bicycle holders; preparation of the necessary technical documentation for the second stage of the modernization. The

Municipality of Gdynia managed to finalise the modernization of the first part of Świętojańska Street in the 5th month of the Project, one month earlier than it was planned.

In order to start the modernization the Public Transport Authority (ZKM) worked out special plan for the public transport how to solve the transportation problems resulting from temporary closing of the Street for PT.

Map 3: Świętojańska Street and stages of its modernization



Stage two

Stage two covered the section of 568 metres between Żwirki i Wigury Street and Al. Marsz. Piłsudskiego Street (see light blue line at the **Map 3**).Technical works within the 2nd stage were consisted on:

- tasks not budgeted within the measure but necessary for further works, i.e. demolition and earth works, producing and installing the barrier curbs, renovation of rain and sanitary sewage system, rebuilding of lighting;
- tasks included in the measure: works connected with installation of the trolley-bus traction net.

On the 24th of October 2003 the modernization of the second part of the Street was accomplished and the Street was officially opened to the public. 1,595 of running meters of modern trolley-bus traction have been installed on new 68 new traction pillars. The possibilities of unlimited parking were restricted with the use of 470 bollards. Currently, similarly to the first stage of modernization, there are only special places dedicated to parking and only in parallel position to the main street. On the Street also 6 bicycle holders allowing for safe parking of about 60 bicycles were installed.

Promotion strategy

Promotion of the PT has been playing a very important role in the TELLUS Project the more as to gain such intermediate objectives as *Increased number of pedestrians and bicycle riders in the city centre, Increased number of trolley—bus users, Low number of private vehicles entering the clean city centre area, Appearance of various forms of new initiatives in the service sector related to the leisure activities in the main street* significant change in mentality is inevitable. Public Transport Authority (ZKM) has been responsible for the great part of promotion strategy of the PT in Gdynia.

Within the TELLUS Project ZKM undertook many activities considered as crucial for sustaining the high share of PT in transportation:

- creation of the transportation map of the operative area of ZKM (with lines and routes on a real map of Gdynia) available on most of the bus stops and as folders;
- creation and updating of a special web programme allowing for finding the fastest and most convenient connection between two places in the city;
- creation of the Customer Service Point in the centre of the city where everybody can receive all the information needed on the PT in Gdynia;
- distribution posters in buses and trolley-buses showing advantages of PT over private vehicles;
- introduction of seasonal public transport tickets;
- organisation of researches on the transportation behaviours of inhabitants of Gdynia;
- edition of trolley-bus calendars;
- organisation of the special action “Transport education” encompassing school meetings with youngsters to educate them how important it is to use PT and why,
- preparation and distribution of promotion material such as mouse props, posters, pens, advertising bags, caps, T-shirts and mugs.

ZKM also runs a web-site providing up-dated information on PT in Gdynia, buses and trolley-buses lines as well as their schedules. It also helps passengers to find out the most comfortable route to each chosen stop.

ZKM in co-operation with trolley-bus operating company introduced a campaign promoting trolley-buses. Several trolley-buses have an inscription encouraging inhabitants of Gdynia to use this mean of transport as a very environment friendly one. ZKM works also on the promotion of the collective modes of transport in general.

Moreover ZKM together with the City Hall organized such events:

- 60th anniversary of trolley-bus transport in Gdynia;
- 75th anniversary of Public Transport in Gdynia;

Additionally the European Integration Department organised the TELLUS-Workshop on "Making city most attractive through integrated planning" (2003) and in co-operation with the Traffic Engineering Department and the Commission on Transportation of the Union of the Baltic Cities the "Public Transport Seminar on Trolley-bus Systems" (2005) in Gdynia.

Moreover free of charge some thousands copies of map of bicycle routes in Gdynia (2003) with its updated version two years later (2005) was printed by the City Hall.

The TELLUS Project and proper transport behaviors were promoted every year during the celebration of the Feast of the Świętojańska Street at 23rd June. Processions, contests and concerts are organized then and Świętojańska turns into promenade.

Figure 7: Świętojańska Street Feast

Stage three

Stage three covers the section of 443 metres between 10 Lutego Street and Kaszubski Square (see light green line at the **Map 3**). Unfortunately the third stage of modernization of the Świętojańska Street has been delayed because of technical and financial problems and will be completed after the end of TELLUS Project. It turned out that works necessary to be done at first cannot be carried out in winter and early autumn as they require deep excavation which is impossible due to frozen ground. Moreover Gdynia has started

implementation of huge transport investments with total costs amounting about € 85 M co-financed by ERDF. With so tight budget the local authorities decided to postpone by few months realization of the third stage of modernization to avoid cash flow problems. Contract for the work on the third stage of modernization was put out to tender and the date for the official opening of submitted offers was appointed at 16th November 2005. Taking into account public procurement act and appeal procedures it is difficult to determine when the subcontractor might start. Completion of the construction works is planned on the second quarter of 2006.

Owing to that situation final results will occur too late to measure them. Consequently following milestones: **M4** Modernization of main city street (third stage), **M5** Final adaptation of the Trolley-bus traction and **M6** Demonstration and monitoring of the use of clean transport will not appear within the TELLUS Project confines. Modifications of those milestones are inevitable.

Table 5: Milestones planned in the TELLUS Local Evaluation Plan for Gdynia and actual achievements

No of milestone	Planned milestones	Date	Actual achievements
5.6.1.	Modernization of the main city street (1st stage)	month 6.	1st stage completed (5th month)
5.6.2.	Demonstration and monitoring of the use of clean transport	month 18.	completed
5.6.3.	Modernization of the main city street (2nd stage)	month 30.	2nd stage completed (21st month)
5.6.4.	Modernization of the main city street (3rd stage)	month 42.	3rd stage not completed
5.6.5.	Final adaptation of the trolley bus traction	month 42.	not completed
5.6.6.	Demonstration and monitoring of the use of clean transport	month 42.	not completed

4 Results

4.1 Evaluation methods

A set of evaluation indicators for Gdynia was established based on the MAESTRO and METEOR approach and specific situation of the city and the demonstration measure.

To ensure proper evaluation of the demonstration measure in Gdynia careful selection of the most appropriate methods was carried out. The methods concentrate on measuring actual results, outputs and changes.

In case of ***Environment*** and ***Transport areas*** measurements and calculations were chosen. To gain information on ***Society area*** mainly surveys were suitable.

The time of measurements/surveys was chosen in connection with completion date of every stage of modernization to minimize influence of temporary factors and show precisely results of the measure. During the course of the TELLUS Project some changes in the schedule of data collection occurred, mainly owing to indicator units of available base line data. Such situations concern data collected regardless of the TELLUS Project e.g. number of collisions counted by the Police.

Taking into account **Immediate objectives** *Modernized trolley bus traction and its adjustment to the inhabitants' traffic* and *Reorganization of parking places* they have been achieved (within the modernized parts of the Świętojańska Street). 3,335 running metres of the new trolley-bus traction were installed on 136 traction pillars which eliminated noise and events of trolley-bus belts falling down of the traction which disturbed traffic very frequently in the past. Moreover, thanks to 961 bollards incorrect parking which hinders traffic is impossible.

Within two first stages of the modernization of the Świętojańska Street following outputs were gained:

Output	***First stage***	***Second stage***	***Total***
Length of the part of the Street modernized:	625	568	1,193 m
Length of the new trolley-bus traction:	1,740	1,595	3,335 m
Number of new traction pillars:	68	68	136
Number of new bollards:	491	470	961
Number of new bicycle holders:	6	6	12

In the Local Evaluation Plan months of measurement were established due to data availability, time of completing particular stages of street modernization and technical conditions (equipment availability). Since the third stage will be finished too late to measure its results from amongst measurements planned on September 2005 only these necessary to provide any data to compare with base line have been carried out. They measure the situation after two stages of modernization. Table 6 presents evaluation areas, methods, time and changes of carrying out of certain measurements.

Table 6: Evaluation areas and time of measurements planned for TELLUS Project in Gdynia

Evaluation area	Impact	Methods of measurement	Planned TELLUS month	Changes
Environment	Air Quality	Quantitative, derived, measurement	M22, M44	To provide comparability and to ensure the most complete information average annual levels were measured from 2001 to 2004
	Emissions	Calculated, quantitative, measurement	M2, M44	To keep comparability measurements necessary to calculate indicators second time were carried out from March to April 2005 (M38 – M39) as it had been done within the same months when calculating base line data
	Noise	Calculated survey, quantitative, measurement	M7 (estimation) M10, M22, M44	In M44 measurements were not done as situation after 2 first stages had been known
Transport	Transport Safety	Quantitative, collected	M6, M22, M44	Base line data regarded annual numbers thus next measurements also concern annual data of 2002, 2003 and 2004
	Congestion levels	Calculated, quantitative, measurement	M22, M44	In M44 measurements were not done as situation after 2 first stages had been known (measurements in M22)
	Accessibility			
Society	Public awareness for TELLUS	Collected	regular	
	Users and shopkeepers acceptance of a modernized street	Survey, collected	M22, M44	In M44 measurements were not done as situation after 2 first stages had been known (measurements in M22)
	Appearance of new forms of initiatives in the service sector	Survey, collected	M8, M32, M44	No changes
	Improvement in intra-organisational co-operation at the city level	Collected	M22, M44	No changes As changes within this indicator are not directly connected with technical works survey was carried out in M44

4.2 Impacts

As explained above the demonstration measure in Gdynia consists of three stages out of which only two have been already finalized within TELLUS Project. The last one will be completed a couple of months after the end of the Project.

Immediate and intermediate objectives of the measure have been reached for the completed sections of the Świętojańska Street. Trolley-bus traction is modernized and adjusted to the inhabitants' traffic at the larger part of Świętojańska Street and parking places are reorganized (see: numbers at the 4.1 section).

More trolley-bus users

The number of passengers using the trolley-bus line crossing the Świętojańska Street increased by 13.2% on this section after the first stage of modernization according to measurements and calculations carried out by the Public Transport Authority. Probably the change was caused also by modern traction providing smooth and quiet transport.

Less private vehicles

According to measurements and calculations carried out by external experts from the Technical University in Gdańsk the number of private vehicles visiting the clean city centre area decreased. The availability of parking places improved even though due to bollards parking at forbidden places is impossible. Access to parking places in vehicles per parking area changed from 1.3 in 2000 to 1.1 in 2003.

New initiatives attracting people

More new initiatives in the main street such as cafes, restaurants, pizzerias or cake shops[4] attract more pedestrians who can safely spend their free time on the promenade (wide 7 meters pavements). Such a friendly situation supports comfortable walking, window shopping and resting. Before the TELLUS Project there were 11 restaurants and 3 cafes at the Świętojańska Street whilst after the second stage of modernization there were 18 restaurants and 17 cafes. The number of cafes has increased more significantly because it is easier to start and to run such a business.

Contribution to the TELLUS objectives

The completion of the two stages contributes to the city-specific TELLUS objectives.

Reduce congestion

[4] Two kinds of initiatives can be distinguished for better interpretation: 1. 'Restaurants': pizzerias, restaurants and fast foods; 2. 'Café': cafes, open-air cafes, cake shops or „ice cream shops".

Reorganization of parking places and improvement in public transport quality contributed to reduce congestion. Traffic flow declined by 9% (from 662 vehicles per hour in 2000 to 601 vehicles per hour in 2003) whilst capacity increased by 2% (from 1,660 vehicles per hour in 2000 to 2,015 vehicles per hour in 2003). At the same time values of *Average vehicle speed peak/off-peak* indicators increased slightly (0.4%– 2%; see: ANNEX, Table A.1-3).

Reduce air pollution

Data available from air monitoring stations on *Air quality* do not reflect precisely the influence of the demonstration measure because of significant distance from the laboratory area and influence made by external factors. Consequently the figures show rather general air quality development in Gdynia and not only results of the TELLUS measure. Levels of PM_{10} and SO_2 increased in the first two years (2002, 2003) and then dropped significantly in 2004. In case of CO levels the number decreased in the first two years and increased in 2004, but still was lower than in 2001 (baseline). NO_2 levels increased in the first year, then dropped in the next 2 years and in 2004 were at the same level as in baseline year. NO_x levels decreased in each year. In case of each indicator limit values imposed by the UE and Polish law were not exceeded.

In case of the values of emissions indicators have improved except Benzene emissions. CO emissions decreased by 53% and NO_x by 62% when comparing base line situation with situation after two stages of modernization. The only increase regards Benzene and equals 49% (increase from 0.0045 to 0.0067 g/vkm). Taking into account that measurements necessary to obtain base line data were carried out when the first stage of modernization was under implementation and that indicators' values show improvement despite the fact that road traffic at the intersection being the place of measurements has increased[5] environmental situation has improved. In case of each indicator limit values imposed by the UE and Polish law were not exceeded.

Reduce noise

In case of noise levels the most important drop was noticed after the first stage. After modernization of the second stage the noise levels decreased remarkable. Noise immission during the day decreased by 6 db and by 1 db during the night on modernized part of the street compared with situation before the TELLUS. It seems that noise situation balanced at certain level and it is likely to remain like this. In each case noise level was below permissible noise level imposed by the national law.

[5] partly due to traffic reorganization caused by current transport investment close to the Świętojańska Street – Różowa Road.

Improve intra-organisational co-operation at the city level

Although this objective concerns city level in case of Gdynia demonstration measure it is mostly related to measure level as about twenty people from the City Hall and commune's units from among almost nine hundreds working there have been involved in the realization of the TELLUS Project. Seventeen of them were surveyed two times (in 2003 and 2005) to find out any changes in their perception of international Projects. Attitude towards the TELLUS Project among respondents turned out to be very positive. Thanks to the TELLUS Project acceptance and understanding of the EU's standards as well as financial and organizational requirements within departments/commune's units involved in the TELLUS Project have arisen. However it cannot be assumed that attitude towards international Projects among all the people working at the City Hall/commune's units has changed.

Achieve extensive political and public awareness for TELLUS objective

The Key Indicator *Media response* has been divided into three new indicators: *Media exposure, Events organized, Presentations given.* Until October 2005 media issued information on the TELLUS Project in Gdynia 40 times which indicates that the demo attracted public attention. To increase awareness on the modernization and the TELLUS related objectives on clean city 4 events were organized and 14 presentations given.

In addition to media response in Gdynia the public was consulted on awareness about TELLUS and their opinion about the measure. The Public Transport Authority runs a web-site providing up-dated information on PT in Gdynia as well as giving passengers the opportunity to find out the most comfortable route to each chosen stop (see Figure 8: Website of the ZKM). ZKM made use of the web-site and carried out an one-question on-line poll, asking "How many and which cities are involved in TELLUS Project within CIVITAS Initiative?". Out of 1,955 respondents 54% gave a correct answer. To attract inhabitants' attention such short one-question on-line opinion polls are carried out very often.

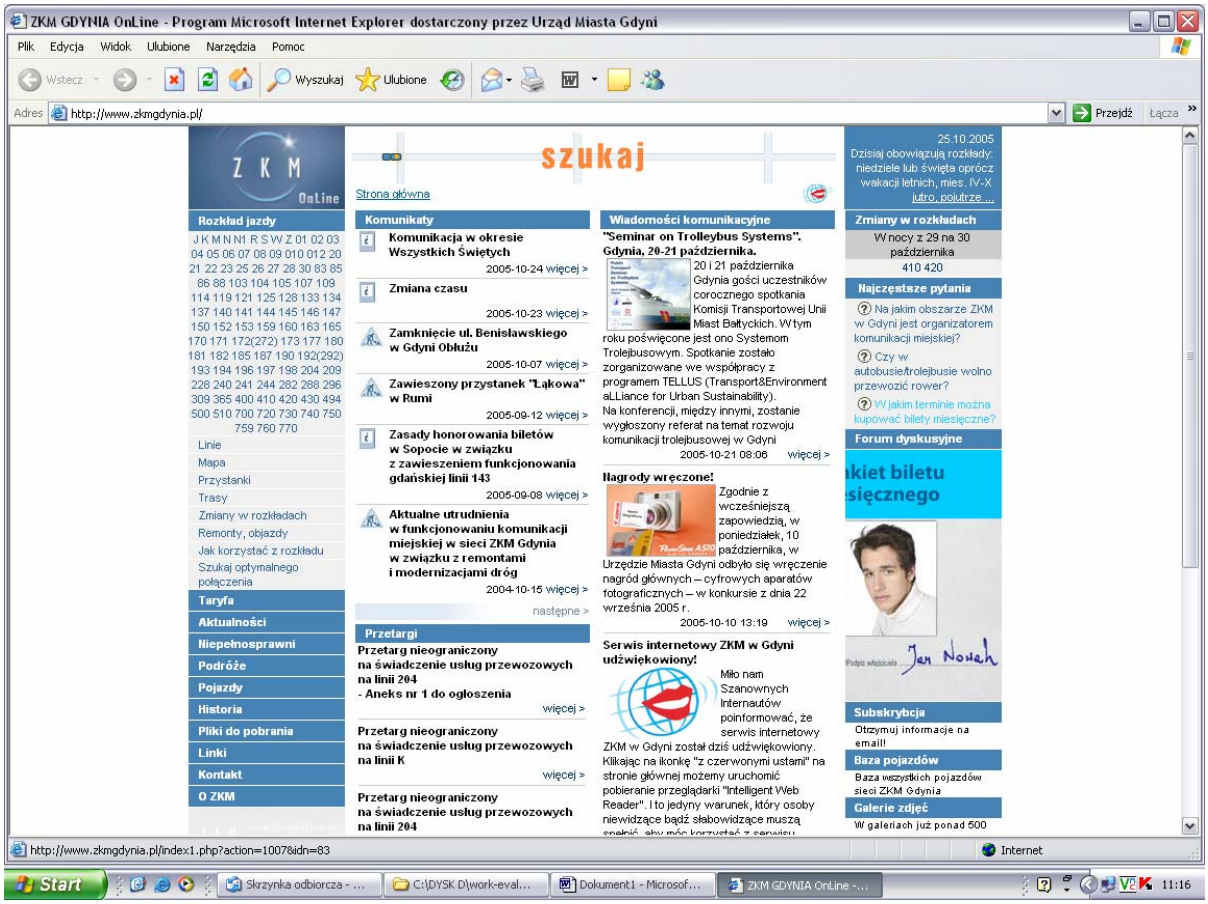
After the second stage of modernization a survey amongst inhabitants was carried out. The question forms were published in the bulletin Ratusz (Information of the Council and the Mayor of the City) and distributed as well as collected by the Offices of District's Councils, the Non-governmental Organizations' Centre of Gdynia and collected at the Information point in the City Hall of Gdynia. The opinion poll was filled in by 416 inhabitants. It showed the following results: 91% of respondents like the new image of the Gdynia's main street only 9% are not convinced.

Bollards, making parking impossible on the pavement, are supported by 76% of the respondents. Some drivers have objections as they have to park farther away, but no overwhelming protests arisen. 78% of the respondents appreciate the new trolley bus traction system. 77% of the respondents likes open-air cafes, but 14% is against and it is indifferent to 9%. This element is a little bit controversial as tables and chairs occupy considerable part of the pavement and additionally some clients are noisy.

Finally, the internet service of the Public Transport Authority in Gdynia was acknowledged by the PT magazine “Depot” as the best in Poland (No 7/2005). Moreover they decided that PT management in Gdynia is one of the best in Poland. ZKM found the golden mean to fulfill passengers’ expectations using among others more than one common carrier to make PT more competitive.

Taking into account that Internet becomes one of the most important communication tool (ZKM’s web-site was visited almost 165,000 times in August 2005) ZKM’s decided to improve its Internet service and make it more useful for users. At the end of October 2005 a new interactive map of the city and its neighborhood with the active layer of the city transportation network with possibility of enlarging it 5 times replaced the previous interactive schematic transportation network map.

Figure 8: Website of the ZKM



Summary

As a conclusion an assessment of the considered indicators is given in the table 7. The results are understood as effects on indicators comparing to the situation before the modernization (baseline) to the situation after implementation of two first stages.

Table 7: Impact of indicators measured within TELLUS Project in Gdynia

Evaluation area	Indicator	Impact
ENVIRONMENT	Particulate levels	+/-
	SO_2 levels	-
	CO levels	-
	NO_2 levels	+/-
	NO_x levels	+
	CO_2 emissions	+/-
	CO emissions	++
	SO_2 emissions	+
	NO_x emissions	++
	Methane emissions	+
	Pb emissions	++
	Benzene emissions	-
	Emissions of specific hydrocarbons known to be health hazard	+
	Average noise $L_{Aeq,T}$	++
TRANSPORT	accidents	++
	collisions	+
	injured	+
	Traffic flow	++
	Average vehicle speed – peak	+/-
	Average vehicle speed – off peak	+
	Capacity	++
	Time lost	+
	Access to parking places	+
SOCIETY	Media exposure	++
	Events organized	+
	Presentations given	++
	Acceptance rating	++
	Number of initiatives	++
	Change in actors' behavior	+

"n.a." - not available yet "+" – improved "-" – worsened "+/-" – no change or negative impact equals positive one

Detailed information on each indicator is available in ANNEX (tables A.1-1 – A.1-5).

5 Conclusions

From the analysis of the implementation process described above conclusions can be drawn regarding the factors that promoted or hindered a successful implementation of the demonstration measure.

5.1 Drivers

Political commitment: For the success of the measure it was essential that individuals in the public authority backed the modernization of the Świętojańska Street and supported the idea of trolley-bus transport improvement as innovative venture providing sustainable development.

Inhabitants' acceptance: Inhabitants' positive attitude towards modernization helped to convince owners of the shops along the Świętojańska Street that they will not loose but take advantage of the modernization.

Changes in the transport situation at the Świętojańska Street: before modernization the Street was strongly congested in rush hours and consequently trolley-buses had significant delays. This situation was harmful to PT quality and intensified usage of private cars. The main Street of the city was overloaded with cars trying to dive and trying to park on narrow pavements which was very inconvenient for inhabitants and deterred them from spending there their leisure time.

Status of EU-Project: The label of being part of an EU-Project helped to convince general public that access restrictions, reorganization of parking places as well as supporting a clean means of transport (trolley-buses) in some way are inevitable to provide citizen friendly city centre.

5.2 Barriers

Financial problems: there was uncertainty if the second and third stage of modernization will start according to schedule as on the whole modernization Municipality of Gdynia has to contribute 7.5 M EUR. In case of the second stage everything had gone smoothly and it was completed on time. Whilst in case of the third part the local authorities decided to postpone realization by few months due to tight budget. Municipality of Gdynia has started implementation of huge transport investments with total costs amounting about € 85 M co-financed by ERDF and wants to avoid cash flow problems. It is planned to start works in October 2005 and complete the modernization in the second quarter of 2006.

Organizational problems: Świętojańska Street is located in the city centre relatively close to the sea shore and already existing pedestrian areas and runs along the main city's arteries of communication. Many public service institutions like the City Hall are also situated in this

area. The street with small retailers and restaurants constitutes a specific trade centre of the city. So due to its specific role in the city it was impossible to close it completely for the time of modernization. To avoid intense disturbances it was decided to divide modernization in three separate phases. Moreover during each stage currently modernized part of the Street has not been completely closed; only road traffic has been reorganized. Unfortunately owing to this solution modernization lasts longer.

Life style: introduction of more strict access restrictions or even environmental zone would meet a strong social resistance as in Poland people treats such restriction as very inconvenient solutions and limitation of their freedom. Owing to similar situation in Gdynia local politics do not want to cause social discontent and show reserve to such proposals. However it can change in the nearest future as 61% of inhabitants agree to implement ban on parking in certain places of the city (in comparison to 54% in 2002) and 71% has nothing against creation of zones for pedestrians only but simultaneously 51% is against paying for cars' access to the city centre (comparing to 59% in 2002).[6]

Old habits of inhabitants: people in Gdynia are not really used to using bicycle transport in the city centre. Furthermore bicycle facilities have not been numerous there and only after people have discovered the new facilities, they have slowly started to discover the bicycle as a comfortable alternative for busses or cars.

5.3 Resume

The TELLUS demonstration measure in Gdynia has been implemented within three phases to alleviate inconveniences caused by reorganization of the road traffic and construction works. In the lifecycle of the TELLUS two of them have been finalized with success whilst the last one will be completed a few months after the end of the Project owing to financial and technical problems. Despite this situation it is possible to conduct process- and impact-evaluation of these two stages as after completion of each stage certain part of the Street is completely modernized. Moreover achievement of some objectives such as *Achieve extensive political and public awareness for TELLUS objective* does not directly depend on the level of advance in technical works.

Within the two first stages 3,335 running meters of modern trolley-bus traction has been installed successfully on 136 new traction pillars. Newly installed bollards (961) limit illegal parking at the pavements and make PT more reliable and comfortable. Currently, there are only special places dedicated to parking and only in parallel position to the main Street. Moreover there are 12 new bicycle holders encouraging inhabitants to use bicycles.

[6] According to „Transportation preferences and behaviours of Gdynia inhabitants in 2004 year. Marketing survey." carried out by the Public Transport Authority in Gdynia.

Furthermore, as supporting activity the Public Transport Authority (ZKM) has been working on the promotion of the collective modes of transport. Within the TELLUS Project they undertook many activities to sustain the high share of PT in transportation. Consequently expected changes took place: In 2004 only 39% trips were made by car and 61% of trips by Public Transport in comparison with 2002 when on average about 55% of trips were made by car and only 45% by Public Transport.

The third stage of modernization will be finished in the second quarter of 2006 which is too late to measure effects of the completed demonstration measure. Due to such a delay from among measurements of some indicators' values planned on September 2005 only these necessary to provide data to compare with base line and to show situation after two stages completed were done.

After implementation of the two stages of modernization situation within the ***Transport*** and ***Society*** evaluation areas have undoubtedly improved. In case of ***Environment*** field when considering the most reliable data (i.e. emissions measured at one of the intersection of the Świętojańska Street) improvements ensued as well.

The Świętojańska Street is now more environment and citizen friendly. Thanks to new modern trolley-bus traction noise level dropped significantly. Inhabitants and tourists can walk along the Street on wide pavements not over-packed with parking cars. There is more room for open-air cafes and new initiatives offering interesting leisure time. Due to reorganization of parking places and new infrastructure (traction) trolley-bus transport is more reliable and attractive. According to ZKM's data the number of passengers using the trolley-bus line crossing the Świętojańska Street increased by 13.2% on this section after the first stage of modernization. Moreover lower number of private vehicles enters the Street. Transport patterns became changing. Amongst inhabitants 91% of respondents like a new image of the Gdynia's main Street and it does not suit only 9% of the asked (opinion poll was carried out after completion of the second stage of modernization).

Achievement of Objectives

As already described in Chapter **B1/2.3** the demonstration measure aimed at different level objectives. Table 8 summaries the achievement of the measure objectives. Details/numbers justifying certain grade choices can be found in the ANNEX.

Table 8: Overview of grade of achievement of objectives

IMMEDIATE OBJECTIVES	
Modernized trolley bus traction and its adjustment to the inhabitants'	ALMOST
Reorganization of parking places	ALMOST
INTERMEDIATE OBJECTIVES	
Increased number of pedestrians and bicycle riders in the city centre	ALMOST
Increased number of trolley—bus users	ACHIEVED
Low number of private vehicles entering the clean city centre area	ALMOST
Appearance of various forms of new initiatives in the service sector related to the leisure activities in the main street	ACHIEVED
ULTIMATE OBJECTIVES	
Reduce congestion	ALMOST
Reduce air pollution and noise to levels below national and EC	ALMOST
Improve intra-organisational co-operation at the city level	PARTLY
Achieve extensive political and public awareness for TELLUS	ACHIEVED
Grade of achievement: ACHIEVED–ALMOST ACHIEVED–PARTLY ACHIEVED–NOT ACHIEVED	

Although only two third of the measure was implemented it reached objectives in all spheres. The problem with assessing if objectives have been reached is that stages in the Gdynia's demonstration measure do not mean carrying out different kinds of activities within each of them but carrying out the same works every time on different parts of the Street.

Despite the incomplete achievement of objectives and not full degree of implementation the demonstration measure can be assessed as successful with regard to the ***Society*** area. Moreover regarding only two first stages of modernization almost all objectives from the Table above (mainly immediate and intermediate) are met.

The category "almost achieved" is used to indicate that for the first two stages the objectives have been achieved but the third stage could not be considered.

6 Scenarios

The third stage of modernization of the Świętojańska Street will be completed after the end of the TELLUS Project in the middle of the 2006 year and having in mind the success of the two first stages, it can be assumed that the planned objectives will be achieved.

Achievement of objectives

After modernization of the last part of the Świętojańska Street both, modern trolley-bus traction installed and bollards arranging parking places on the widened pavements will contribute to the achievement of the immediate objectives. Only after completion of the third stage of modernization of the Street all bottlenecks will be eliminated and full achievement of the intermediate and ultimate objectives will be possible.

Positive impact of the two first stages

TELLUS demonstration measure in Gdynia concerns creation of the special area at the main street of the city with soft access restrictions and strong support of PT as well as bicycle users. The undertaking aims at providing an environment and citizens' friendly zone in the city centre offering attractive leisure time.

Taking into account high inhabitants' acceptance to the demonstration measure, declared after the second stage of modernization and even better conditions at the Street for inhabitants, tourists and bicycle riders as well as better PT quality, the intermediate objectives will be achieved.

In case of ultimate objective such as *Improve intra-organisational co-operation at the city level* due to low number of persons involved in the TELLUS Project in Gdynia in comparison with the significant number of people working in the City Hall/commune's units, positive results of the surveys can not be considered as a pattern describing attitude towards EU Projects in the whole Municipality but more as a case study.

Up-scaling

Up-scaling of the measure owing to its specificity could not be implemented anywhere else in the city as its other parts and districts are designed for completely different purposes. Implementation of access restrictions to create huge environmental zone encompassing the whole city is impossible and pointless.

The only changes can concern implementation at the Świętojańska Street parking strategies to decrease number of private cars parking in the centre more significantly or more strict access restrictions through e.g. forbidding private cars to access the Street at all.

7 Recommendations

In the TELLUS Project the city of Gdynia is using the modern solutions to make the trolley-bus traffic smooth. The installed traction allows for the much faster and more reliable traffic than it was before. A number of remarkable features of the trolley-bus as a mean of urban transport are ecological soundness, flexibility and cost effectiveness. Trolley bus systems do not pollute urban air and they are silent. Compared to trams the busses are more flexible in using urban road space and more cost-efficient due to low costs for infrastructure. Those advantages may be interesting for other cities.

To attract people to spend their leisure time in the city centre it is very important to address different stakeholders using a combination of measures such as wide pavements comfortable for pedestrians, implementation of access restrictions by parking arrangements as well as bicycle holders.

Implementation of access restrictions to establish clean, environment friendly zone in the city centre should be widely accepted by the common public to avoid social resistance. It is the most important issue in the new member countries of the European Union as car ownership is increasing and cars represents well-being of their owners.

Although the demonstration measure in Gdynia has local impact it is important for the city as it improves local living conditions, quality of life and quality of transport as well as environment. Moreover, elements of a comprehensive transport policy were implemented.

C EVALUATION ON CITY-LEVEL

C.1 General approach

Gdynia implements one demonstration measure within the TELLUS Project so there is no synergy effect on the city level. Therefore evaluation on the measure level is interrelated with evaluation of the TELLUS on the city level.

Moreover, as it was already mentioned in B1, it is not possible to extrapolate all of the results of the demonstration measure to the situation in the whole city. There are at least two reasons for that:

- scale of the measure and
- changes in the traffic conditions due to other parallel transport investments.

The fact that the impact of the measure is tiny on city level affects the assessment of the TELLUS objectives and the TELLUS Key Indicators. Therefore the TELLUS Key Indicators will be accompanied (where possible) with the data showing a change in the whole city caused by large investments in a transport infrastructure. The evaluation areas, methods as well as time of measuring the indicators are shown in table 7 in part B of the report.

Table 9 outlines the TELLUS objectives for Gdynia with their quantifications.

Table 9: TELLUS ultimate objectives 2006 / 2010 for Gdynia

TELLUS OBJECTIVES	Quantification for 2006	Quantification for 2010
Reduce congestion	by 5 %	by 10 %
Reduce air pollution and noise to levels below national and EC directives	to be specified[7]	to be specified
Improve intra-organisational co-operation at the city level	to be specified	to be specified
Achieve extensive political and public awareness for TELLUS	to be specified	to be specified

The ultimate objectives identified as relevant for the measure from 2006 till 2010 will not be described by the measurement of the TELLUS Key Indicators. Since these dates are beyond the TELLUS Project life cycle the contribution of the demonstration measure to the TELLUS objectives can only be estimated on the basis of the available results of the evaluation for 2005.

[7] Limit values imposed by national law and EU directives concerning TELLUS Key Indicators are specified in Indicator Fact Sheets of Gdynia.

C.2 Ex post evaluation for 2006

1 TELLUS Key Indicators

To describe the TELLUS Key Indicators special fact sheets were created – the Indicator Fact Sheets. These Fact Sheets contain all important information concerning the Key Indicators. Elements of the Fact Sheets are the name and the description of the indicator including context and impacts, the unit of the indicator, indicator-related objectives, methods of measurement, sources of data, a timetable for the measurement of the data, the legal basis, the development of the indicator, the relation to other indicator systems and finally references.

The Indicator Fact Sheets provide the basis for the continuous monitoring and further evaluation reports. Their structure enables transparency and comprehensibility, as well as the documentation of the development of the indicators.

TELLUS Key Indicators together with Indicator Fact Sheets can provide an important mean to develop and establish an urban transport monitoring system. TELLUS Key Indicators are documented in the ANNEX.

Table 10 shows the sources of data available for the monitoring of the Key Indicators in Gdynia. Moreover the table gives information on whether the collection of data is of low, medium or high complexity. Table 11 shows the base year as well as latest values of the indicators.

Table 10: Monitoring of the TELLUS Key Indicators in Gdynia

TELLUS objective	TELLUS key indicator	METEOR core indicator	Unit	Source of data	Complexity and method of data collection
TRANSPORT					
Reduce congestion	Average vehicle speed	23/24	km/h	Calculations are done on the modernised street on the basis of four representative periods of time. The measurements are repeated three times.	High: measured and calculated by Technical University of Gdańsk, especially for the purpose of the TELLUS
ENVIRONMENT					
Reduce air pollution to levels below national and EC directives	PM10 levels	7	µg/m³	ARMAAG: 2 continuous air quality monitoring stations	Low: secondary data analysis
	NO2 levels	6			
	CO levels	5			
Reduce noise to levels below national and EC directives	Noise calculations	12	Noise level L_{Aeq} in dB	Calculation of noise pollution for the modernised street with a division to night and day	High: measured and calculated by Info-Eko company especially for the purpose of the TELLUS
SOCIETY					
Improved intra-organisational cooperation at the city level	Co-operation strategies	none	descriptive	Own survey	High: interviews with staff of relevant departments/ commune's units
Achieve extensive political and public awareness for TELLUS	Media exposure	13	descriptive	Media analysis	Medium: analysis of number and quality of media response (newspapers, TV, radio) and events organised as well as presentations given within the TELLUS Project
	Events organized				
	Presentations given				

Table 11: TELLUS Key Indicators in Gdynia

TELLUS objective	TELLUS Key Indicator	Unit	Specification	Base year value *	Latest value
TRANSPORT					
Reduce congestion	Average vehicle speed	km/h	peak	24.0 (2000)	24.1 (2003)
			off-peak	42.5 (2000)	43.4 (2003)
ENVIRONMENT					
Reduce air pollution to levels below national and EC directives	PM_{10} levels	$\mu g/m^3$	annual mean	25.1 (2001)	26.5 (2004)
			24h average (50 $\mu g/m^3$) **		
			annual mean (40 $\mu g/m^3$)	25.1 (2001)	26.5 (2004)
	NO_2 levels		annual mean	15.9 (2001)	15.9 (2004)
			1h average (200 $\mu g/m^3$) ***		
			annual mean (40 $\mu g/m^3$)	15.9 (2001)	15.9 (2004)
	CO levels		annual mean		
			Max daily 8h concentration (10 mg/m^3)	1.96 (2001)	1.92 (2004)
Reduce noise to levels below national and EC directives	Noise level dB(A) road length	equivalent noise level L_{Aeq} in dB(A)	days	72.5 (2002)	66.5 (2003)
			nights	62.8 (2002)	61.8 (2003)

* due to data availability problems for the base year 2001 some numbers concern other years

** 35 exceeding allowed

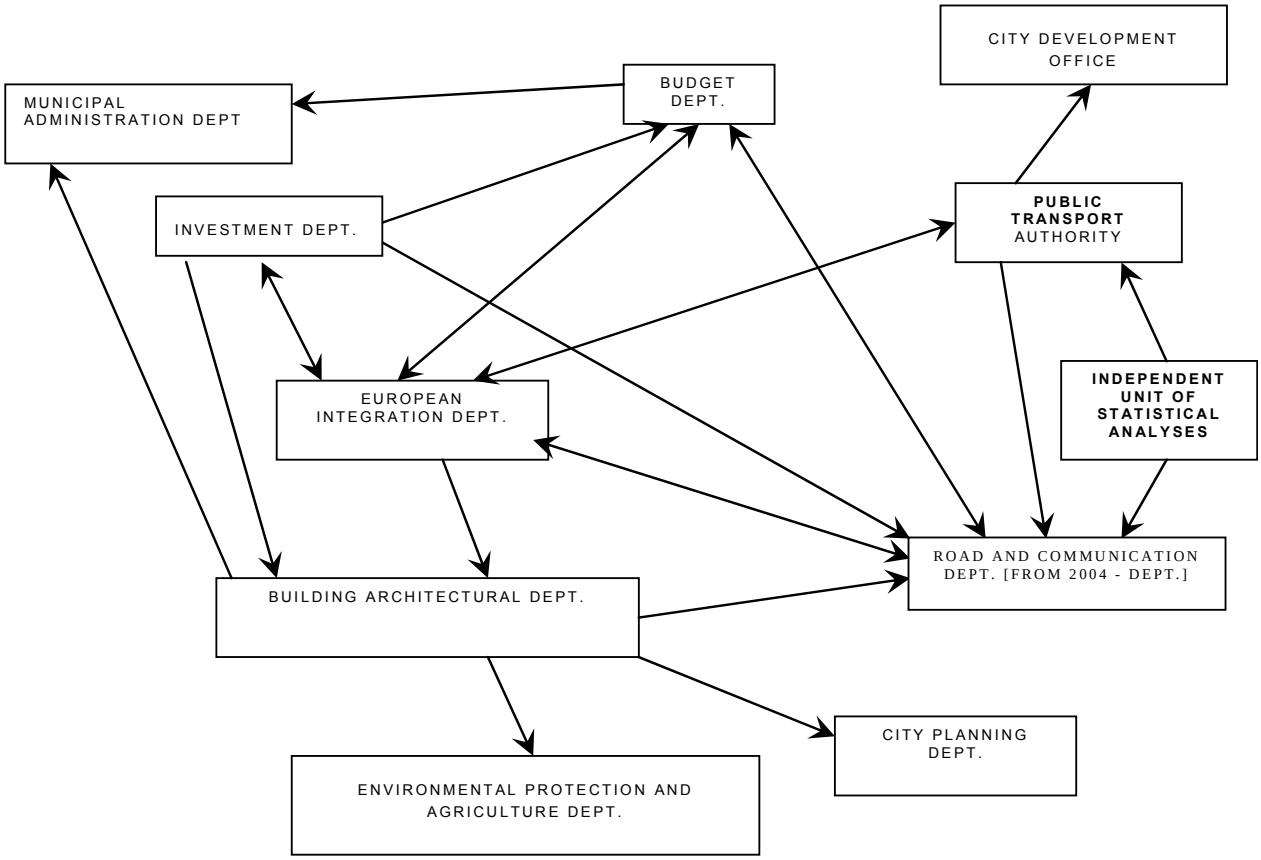
*** 18 exceeding allowed

The assessment of the TELLUS Key Indicators was related mainly to the local level of the measure. Only two objectives could be considered as showing the city level. The first one *Improved intra-organisational cooperation at the city level* showed that attitude towards the TELLUS Project among employees of the City Hall and commune's units had been very positive but owing to not significant number of people involved in the TELLUS Project this

situation could be considered more as a case study and not as a pattern describing attitude towards EU Projects. For TELLUS Project have been working about twenty people from among almost nine hundreds employed in the City Hall as well as commune's units and seventeen of them were interviewed.

Following graph features interactions indicated by employees of City Hall of Gdynia and Commune's Units surveyed in November 2003 and September 2005 involved in the TELLUS Project in Gdynia.

Figure 9: Relations between employees of the City Hall and Commune's Units involved in the TELLUS Project in Gdynia



Two-direction arrows mean that units have identified each other, whilst one-direction arrows inform that only one party thinks that co-operates with another unit (pointed party).

The second objective *Achieve extensive political and public awareness for TELLUS* was measured with the Key Indicator *Media response* later divided into three new indicators: Media exposure, Events organized, Presentations given. Until 31st October 2005 media issued information on the TELLUS Project in Gdynia 40 times, 4 events were organized and 14 presentations given on the same topic.

Moreover a survey amongst inhabitants was carried out after the second stage of modernization. Forms with questions were published in the bulletin Ratusz (Information of

the Council and the Mayor of the City) and distributed as well as collected by the Offices of District's Councils, the Non-governmental Organizations' Centre of Gdynia and collected at the Information point in the City Hall of Gdynia. 416 inhabitants responded to that poll. The survey showed the following results:

- The survey showed that 91% of respondents liked the new image of the Gdynia's main street and only 9% were not convinced.
- Newly installed bollards, making parking impossible on the pavement, were supported by 76% of the respondents. Some drivers were unconvinced as they had to park farther away, but no significant protests had arisen. 78% of the respondents appreciated the new trolley bus traction system.
- 77% of the respondents liked open-air cafes, but 14% was against and it seemed to be indifferent to 9%.

Additionally ZKM's carried out an one-question on-line poll asking "How many and which cities are involved in the TELLUS Project within CIVITAS Initiative?". Out of 1,955 respondents 54% gave a good answer. The web-site run Public Transport Authority provides on-going information on PT in Gdynia, buses and trolley-buses lines as well as their schedules. It also helps passengers to find out the most comfortable route to each chosen stop.

Thanks to additional results obtained within tasks out of the TELLUS Project of the modernization of the Świętojańska Street such as modern lamps of the Street Municipality of Gdynia won the competition "Municipality and city illuminated the best in 2005" in a category "Illumination of a chosen space or object" organised by the Employers' Union of Warsaw and Mazowsze.

Figure 10: Illuminated Świętojańska Street

Contribution to METEOR evaluation

The METEOR Project has been working on the cross-site evaluation of the CIVITAS Projects. They have been using Common Core Indicators (CCI). In Gdynia only CCI congruent with TELLUS Key Indicators have been considered. The ITEMS model has not been used as it is not applicable for Gdynia's situation.

CCI reflect the wide range of measures in the CIVITAS Projects but show different relevance for the Gdynia situation. In table 12 the relevance of the indicators is stated and information about the availability of the data is given.

In case of Gdynia:

- indicators with high relevance are congruent with the TELLUS Key Indicators or are the measure may have significant impact on them,
- indicators with medium relevance might be influenced by the measure but there are many others factors independent from the Project having impact on them (e.g. coal heating systems) and,
- indicators with low (no) relevance are not in line with the objectives of the demonstration measure in Gdynia.

It was planned to collect the data at least twice: in the beginning of the Project to identify baseline and in the end to measure actual results of the Project. Unfortunately the third stage of modernization has been delayed so much that it will be finished in the second quarter of 2006 after the CIVITAS I. Consequently some measurements were not done as they would have not shown final results.

Table 12: Common Core Indicators available in Gdynia

No.	Common Core Indicators	Relevance HR = High relevance MR = Medium relevance LR = Low (no) relevance	Source / table to find numbers/assessment of the indicator		Indicator will be evaluated
			No of the table	ANNEX	
1.	Operating revenues	LR	Table 14, 15	Table A.3-6	X*
2.	Operating costs	LR	Table 14, 15	Table A.3-7	X*
3.	CO levels	MR	TKI; Table 7	Table A.1-1	X
4.	NO_x levels	MR	TKI; Table 7	Table A.1-1	X
5.	Particulate levels	MR	TKI; Table 7	Table A.1-1	X
6.	CO_2 emissions	HR	Table 7	Table A.1-1	X**
7.	CO emissions	HR	Table 7	Table A.1-1	X**

No.	Common Core Indicators	Relevance HR = High relevance MR = Medium relevance LR = Low (no) relevance	Source / table to find numbers/assessment of the indicator		Indicator will be evaluated
			No of the table	ANNEX	
8.	NO_x emissions	HR	Table 7	Table A.1-1	X**
9.	Noise perception	HR	TKI; Table 7	Table A.1-2	X
10.	Acceptance level	HR	TKI; Table 7	Table A.1-3	X
11.	Perception of PT accessibility	LR	Table 14, 15	Table A.3-1	X*
12.	Perception of PT security	LR	Table 14, 15	Table A.3-2	X*
13.	Accuracy of PT time keeping	LR	Table 14, 15	Table A.3-3	X*
14.	Quality of public transport services	MR	Table 14, 15	Table A.3-4	X*
15.	Transport safety	LR	Table 7	Table A.1-2	X
16.	Average vehicle speed – peak	HR	TKI; Table 7	Table A.1-3	X***
17.	Average vehicle speed – off peak	HR	TKI; Table 7	Table A.1-3	X***
18.	Average occupancy	LR	Table 14, 15	Table A.3-5	X*

* The method of collecting/measuring allows for gathering data on the city level not on the laboratory area with regard to PT.

** This indicators refer to the same data mentioned in TELLUS Key Indicators and METEOR Common Core Indicators. However Gdynia has already used “European system of emission evidence CORINAR” instead of COPERT proposed by METEOR.

*** In order to have comparable data of before Project and after Project Gdynia must use the timing of measuring that was already used.

Eleven out of eighteen indicators have been already described, whilst seven indicators concerning quality of Public Transport in Gdynia are presented in the following table.

Table 13: Common Core Indicators available in Gdynia from Public Transport Authority

Indicator	Method of measurement	Sources of data	Frequency of measurement
Perception of PT accessibility	survey	Public Transport Authority	regular
Perception of PT security **			
Accuracy of PT time keeping			
Quality of PT service			
Average occupancy			
Operating revenues			
Operating costs			

Perception of PT accessibility

According to passengers low level of accessibility of PT was a very important problem in 2000-2003 and it improved significantly in 2004. Accessibility can be assessed in Gdynia using the only available information on inhabitants' travelling expectations – amongst seven choices accessibility was ranked very high in 2000 – 2003 (at the first or second place) but in 2004 it was at the forth place.

Perception of PT security

Question on security asked to inhabitants was not the same in 2004 as in 2000, but some conclusions can be drawn. 94% respondents perceived PT vehicles as almost always secure in 2002 whilst in 2004 more than 92% of interviewed passengers had not felt as being in danger and robbed or assaulted when travelling by PT.

Accuracy of PT time keeping

PT services which arrived more than 3 minutes late constituted 8% in 2000 and 11% in 2004 whilst delays from 1 to 3 minutes concerned 21% of PT vehicles in 2000 and 27% in 2004.

Quality of PT service

Opinion on quality of PT services is rather stable: more than 90% respondents declare that it is satisfactory, good or very good (every surveyed year).

Average occupancy

Only data concerning average number of passengers per one ride is available: Average PT occupancy dropped from 63.1 persons in 2000 to 59.6 in 2004.

Operating revenues and operating costs

When considering operating revenues and operating costs per vkm and PT passenger the change (increase) is more dynamic in case of costs which mean that PT has become less profitable. Operating revenues per vkm increased from 2.77 zł/vkm in 2000 to 3.37 zł/vkm in 2004 i.e. by 22% whilst at the same time operating costs per vkm increased from 3.95 zł/vkm to 5.05 zł/vkm i.e. 28%.

Summarising development of CCI in Gdynia can be described by means of table 14.

Table 14: Development of Common Core Indicators in Gdynia

Indicator	
Perception of PT accessibility	+
Perception of PT security	+ / -
Accuracy of PT time keeping	-
Quality of PT service	+ / -
Average occupancy	-
Operating revenues	+
Operating costs	-

"n.a." - not available yet "+" – improved

"-" – worsened "+/-" – no change or negative impact equals positive one

More detailed information on each indicator is available in an ANNEX (Table A.3-1 – A.3-7).

2 Contribution of TELLUS

TELLUS Project is a very important showcase for local stakeholders presenting that even a small locally based measure might have its impact on the attractiveness of the area. Although the impact of the change in traffic conditions on the modernised street on the whole area of the city is very small the situation in the down town area improved significantly. Improvement of the trolley-bus transport due to better transport conditions encouraged people to wider use of trolley-buses on the Street.

Moreover, the city policy moves in the direction of wider promotion of Public Transport especially trolley-buses as the cleanest mode of transport in Gdynia. Generally new investments in road infrastructure, which are connected with trolley-bus infrastructure, contain the element of installation of new traction. Municipality started a new Project with ERDF assistance in which a new trolley-bus depot will be built and the bus lines will be extended. Such activities somehow have their beginnings in the TELLUS Project result - improved image of Public Transportation in Gdynia. According to the last research made by the Public Transport Authority there is an increase in modal share in favour of PT versus private vehicles. In 2002 on average about 55% of trips where made by car and only 45% by Public Transport. In 2004, when the research was made, the situation changed radically; only 39% trips were made by car and 61% of trips by Public Transport.

Probably apart from the investments in PT and its promotion such a change was also influenced by the rise in the fuel price while the PT ticket prices remained at the same level.

3 Baseline and trend scenario

Baseline and trend scenario are to be elaborated thanks to ITEMS model which unfortunately due to lack of data could not be elaborated for Gdynia.

C.3 Ex ante evaluation for 2010

Gdynia has a population of 253,000 people and according to demographic section 63.5% of the Gdynia inhabitants constitute men in active age.

Gdynia is a city of maritime traditions and origins so its development strategies are closely linked with maritime economy. Cargo, container and passenger terminals together with shipyard and military port as well as ship owners and all maritime back-up services have been determining character of the city. This sector employs about 30% of the city residents. Private entities have developed within the last decade and in 2004 more than 75% of all employed were working for them. Most of firms are small entities employing no more than 9 persons.

The TELLUS Project is a specific initiative which addresses traffic problems in the city centre. Demonstration measure implemented in Gdynia initiated inevitable changes in congested down town. To keep the city centre clean additional efforts are required. The authorities in Gdynia being aware of such needs have been undertaking many other activities in the city to fight against congestion. To show how the traffic situation on the city level is influenced by the on-going large infrastructural investments it is worth to mention that thanks to them traffic speed in the city in the year 2010 will increase for about 20%[8].

Ex ante evaluation and scenarios elaborated within the TELLUS refer to the situation to be achieved in 2010 but most figures available in Gdynia concern 2013[9] so sometimes they have been used to describe future.

Since this period is out of the scope of the Project the results might be only estimated based on scenarios developed by the planning administration and taking into account policies, strategies and measures to be performed in Gdynia within this time frame. Basing on the "Strategic Plan for Development of Gdynia", Gdynia's "Transport Policy" and "Integrated Development Plan of Public Transport in Gdynia for years 2004-2013" a number of investments and transport measures will be and might be implemented. By 2010 the following transport projects for certain will be completed in Gdynia (they are under construction):

- Construction of the Różowa Road;
- "Extension of the Janek Wiśniewski Street in Gdynia – phase II" and
- "Construction of the Kwiatkowski Route in Gdynia – III stage".

[8] In comparison with the situation of not investing.

[9] Source: Resolution of the City Council of Gdynia no XVII/366/04 of February 2004 on passing the „Integrated Development Plan of Public Transport in Gdynia for years 2004-2013".

The second and third infrastructure projects are co-financed by ERDF with 51.6 M EUR and will be completed in 2007.

Implementation of those investments will change radically traffic situation in Gdynia and will lessen impact of other changing factors like increase in the number of private vehicles and increase in the population of the city.

Moreover the Project "Development of the environment friendly Public Transport in Gdynia" granted with € 4.5 M from ERDF has been started. Until 2006 a new trolley-bus depot, terminus and new lines (10.6 km) will be constructed within the Project. Additionally 10 new modern trolley-buses will be purchased.

Another very important investment for the city which will have unprecedented impact on the traffic conditions and the same on air quality is creation of an integrated system of traffic management within the whole city. Some parts such as construction of the Park and Ride park in Gdynia Redłowo (to connect road and rail transport) are being implemented currently and by 2010 the system will probably have certain functionality. 8.5 km of the new trolley-bus lines and 7 Park and Ride parks are also planned to be built till 2013.

According to "Integrated Development Plan of Public Transport in Gdynia for 2004-2013" the following effects are estimated for 2013 due to the above mentioned investments:

- means of PT in Gdynia will transport 114 M passengers in 2013 in comparison to 108.5 M in 2003;
- share of PT in trips will equal 57% compared to 55% in 2003;
- share of trolley-buses in trips will equal 35% compared to 26% in 2003;
- average travel time to work place will be 32 minutes in 2013 in comparison to 36 minutes in 2003;
- average travel time to school will be 38 minutes in 2013 in comparison to 44 minutes in 2003.

The growth in number of private vehicles will be most probably balanced by the investments mentioned above. Within previous four years (from 2000 to 2004) the number of private vehicles increased by 7%, but in fact it was probably more as many people take an opportunity to pay less money and register private cars as a truck. According to estimations of the Independent Unit of Statistical Analyses the motorisation in 2004 amounts to 398 cars per 1000 inhabitants, when taking no account of trucks of load capacity over 1,000 kg and of course buses and trolley-buses.

It is very likely that in future some bolder access restriction measures in the city centre will be introduced. The precondition for this policy is creation of alternative routes for those passing close to the dwelling and down town areas. Actually the above mentioned investments are going in this direction.

In case of air quality indicators it is not possible to extrapolate influence of the TELLUS measure in 2010 but bearing in mind the fact that planned investments will improve traffic conditions the air quality is likely to improve as well.

As to the emissions they are in strict correlation with the traffic flow and its intensity. Simple extrapolation of a trend of number vehicles in Gdynia would suggest rather a deterioration of the situation. However, the ongoing municipal investments in the transport infrastructure will allow for introduction of more access restriction measures in the city centre, which may positively change the situation within this area.

D FINAL CONCLUSIONS

The TELLUS Project in Gdynia is a very important showcase for local stakeholders presenting that even a small locally based measure has its impact on the attractiveness of the area. Although the impact of the change in traffic conditions on the modernised street on the whole area of the city is very small the situation in the down town area improved significantly. Improvement of the trolley-bus transport due to better transport conditions encouraged people to wider use of trolley-buses on the Street.

Implementation of access restrictions to establish clean, environment friendly zone in the city centre should be widely accepted by the common public to avoid social resistance.

The Świętojańska Street is now (after two out of three stages of modernization) more environment and citizen friendly. Thanks to new modern trolley-bus traction noise level dropped significantly. Inhabitants and tourists can walk along the Street on wide pavements not over-packed with parking cars. There is more room for open-air cafes and new initiatives offering interesting leisure time. Due to reorganization of parking places (by means of newly installed bollards preventing cars from parking at the pavement) and new infrastructure (traction) trolley-bus transport is more reliable and attractive.

According to ZKM's data the number of passengers using the trolley-bus line crossing the Świętojańska Street increased by 13.2% on this section after the first stage of modernization. Moreover lower number of private vehicles enters the Street. Amongst inhabitants 91% of respondents like a new image of the Gdynia's main street and it does not suit only 9% of the asked (opinion poll carried out after completion of the second stage of modernization).

Within the TELLUS Project life-cycle following drivers and barriers appeared:

Table 15: Drivers and barriers within the life cycle of the TELLUS Project in Gdynia

DRIVERS	BARRIERS
Political commitment	Financial situation (tight Municipality budget)
Public support (Inhabitants' acceptance)	Organizational situation (traffic management problems)
Positive changes in the transport situation at the Świętojańska Street	Life style focused on unrestricted rules
Status of the EU Project	Old habits – people have just discovered bicycle riding as convenient means of transport

Lessons learned from the TELLUS Project are included in the "Integrated Development Plan of Public Transport in Gdynia for years 2004-2013" [10] which supports creation of conditions for efficient and safe travelling of people and cargo simultaneously securing priority for PT

[10] Passed by the Resolution of the City Council of Gdynia no XVII/366/04 of February 2004.

and reducing negative transport influence on environment to realize PT sustainable development strategy. Following tasks are listed amongst the most important ones:

- Implementation of priority for the PT through modernization of the road system of the city, increase in control of the private cars' access into the city centre and construction of the modern ITS traffic management system (including PT traffic management system);
- Development of the trolley-bus transport as environment friendly.

Realization of the "Integrated Development Plan of Public Transport in Gdynia for years 2004-2013" will be monitored among others by measuring the air quality and noise level.

E References

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Contacts

Local Evaluation Manager
Joanna Jankowska
European Integration Department
City Hall of Gdynia
Al. Marsz. Piłsudskiego 52/54
81-382 Gdynia

Phone: 0048 - 58 – 668 8440
E-mail: j.jankowska@gdynia.pl

ANNEX

Indicators

Questionnaire

Additional indicators required by METEOR

A.1 Indicators

Table A.1-1: Indicator list (to be continued)

Impact	Indicator	Unit	Method of measurement	Sources of data	Planned time of measurement	BASE LINE		Collected DATA					
Air quality [1]	Particulate levels	µg/m³	quantitative, derived, measurement	measuring stations of the ARMAAG Foundation	Nov 03 Sept 05	25.1	2001	29.5	2002	31.2	2003	26.5	2004
	SO_2 levels					6.5	2001	7.5	2002	11.8	2003	9.2	2004
	CO levels					307/ 1961.5 [2]	2001	270.7/1840.5	2002	391.9/ 1724.3	2003	344.6/1915.6	2004
	NO_2 levels					15.9	2001	17.6	2002	17.0	2003	15.9	2004
	NO_x levels					26.1	2001	24.2	2002	24.2	2003	22.5	2004
Emissions	CO_2 emissions	g/vkm	calculated, quantitative, measurement	calculations on the bases of global indicators of emissions for the city traffic used by the European system of emission evidence CORINAR and measurements of contaminants' level carried out with DOAS equipment	Mar/Apr 02 Sept 05	43.637	Sept 02	43.637	Mar/Apr 05	Measurements necessary to calculate indicators were carried out from March to April 2005 (M38 – M39) to provide better comparability (measurements when calculating base line data were carried out also in March-April period). Moreover due to delays works concerning third stage in M44 have not even started so there were no chances to find out situation after modernization of the whole Street.			
	CO emissions					8.481	Mar/Apr 02	3.975					
	SO_2 emissions					0.166		0.151					
	NO_x emissions					0.435		0.166					
	Methane emissions					0.012		0.009					
	Pb emissions					0.0008		0.0003					
	Benzene emissions					0.0045		0.0067					
	Emissions of specific hydrocarbons known to be health hazard					0.313		0.222					

[1] As baseline concerns average annual values in 2001 next data also concern average annual values to ensure comparability.

[2] The first figure concerns Polish rules until June 2002 (average annual value); the second one meets requirements of new Polish law adjusted to EU's regulations (i.e. maximum daily 8-hour mean; „old"/"new").

Table A.1-2: Indicator list (continued)

Impact	Indicator	Unit	Method of measurement	Sources of data	Planned time of measurement	BASE LINE		Collected DATA					
Noise	$L_{Aeq,T}$ (day and night)	dB	quantitative, calculated, measurement	data collected and calculated by Info-Eko company	Aug 02 Nov 02 Nov 03 Sept 05	day-72.5 night-62.8	Aug 02 (estimation for the situation before the modernization)	day –67.5 night-61.8	Nov 02	day- 66.5 night-61.8	Nov 03	In M44 measurements were not done as situation after 2 first stages had been known whilst works concerning third stage have not started yet then.	
Transport Safety	accidents	No/y	quantitative, collected	data collected by the Police	Jul 02 Nov 03 Sept 05	9	2001[3]	12	2002	7	2003	6	2004
	collisions					79	2001	45	2002	58	2003	73	2004
	injured					9	2001	18	2002	7	2003	7	2004

[3] As baseline concerns average annual values in 2001 next data also concern average annual values to ensure comparability; as works concerning the modernization influence number of vehicles at the Świętojanska Street data can be influenced as well.

Table A.1-3: Indicator list (continued)

Impact	Indicator	Unit	Method of measurement	Sources of data	Planned time of measurement	BASE LINE		Collected DATA	
Congestion levels	Traffic flow	Vehicles/hr	quantitative, Calculated, measurement	Data collected and calculated by Technical University of Gdańsk and TRAFIK company	Nov 03 Sept 05	662	2000	601	Nov 03
	Average vehicle speed – peak	km/hr				24.0	2000	24.1	Nov 03
	Average vehicle speed – off peak					42.5	2000	43.4	Nov 03
	Capacity	Vehicles/hr				1660	2000	2015	Nov 03
	Time lost	S/vehicle				64	2000	48	Nov 03
Accessibility	Access to parking places	Vehicles/parking area				1.3	2000	1.1	Nov 03
Public awareness for TELLUS	Media exposure	Number of newspaper articles on modernizing the street	Collected	Information in newspapers, magazines, radio or on television	regularly	40	Until the end of October 2005		
	Events organized	Number of workshops, conferences and meetings organized		Workshops, conferences and meetings organized		4			
	Presentations given	Number of presentations given		Presentations given		14			
Users and shopkeepers acceptance of a modernized street	Acceptance rating	Attitude towards changes in the street	Survey, collected	Survey distributed and collected by Offices of District Councils, Non-governmental Organizations' Centre of Gdynia and published in Ratusz –Information of the Council and the Mayor of the City (weekly bulletin)	Nov 03, Sept 05	An opinion poll and numbers collected are available in the **A.2** part of the ANNEX whilst interpretation is in **B1** part of the Report.	Survey was conducted in November 2003 after the second stage of modernization and was not carried out in 2005 because of delay of the third stage.		

Table A.1-4: Indicator list (continued)

Impact	Indicator	Description	Method of measurement	Sources of data	Time of measurement	Collected DATA	
Improvement in intra-organisational co-operation at the city level	Change in actors' behaviour	Attitude towards international Projects	Survey, collected	Survey among employees of the City Hall Departments and Commune's units	Nov 03, Sept 05	Seventeen persons involved in TELLUS Project implementation were interviewed. They were identified on the basis of time sheets. The most frequently pointed Unit was Road and Communication Department (13 times), European Integration Department (11 times) and Budget Department (7 times). Interesting: some Departments were pointed, but no one form them was working for the TELLUS Project – incidental contact; Roads and Transport Department was pointed by 6 other units, but it pointed only 2 (Budget and European Integration); 57% of interactions were defined as very good, 39% good and 4% neutral; in 69% of interactions co-operation has improved and in 31% it has not improved because „it was good enough until now" – 24% [75%], „first contact due to the TELLUS" – 7% [25%]; Quality and intensity have improved alike; Respondents have been using firs of all phone calls (45%) and meetings (38%) and e-mails (17%). In September 2005 seventeen employees from eleven units of the Municipality of Gdynia were surveyed again. It was the same people as in November 2003 with one exemption – in ZKM one person stopped working for the TELLUS Project and his place was taken by another person. Majority of the surveyed has not changed their answers within two years as it was hard for them to divide time they were working for the TELLUS Project into two periods – one before the first survey and the second between the first and the second survey. Consequently no graph was drawn after the second survey, the more so as interactions within the period between the first and the second survey were not too intensive as at the beginning of the Project.	Nov 03, Sept 05

Table A.1-5: Indicator list (continued)

Impact	Indicator	Description		Method of measurement	Sources of data	Time of measurement	BASE LINE		Collected DATA			
Appearance of new forms of initiatives in the service sector	Number of initiatives	New forms for spending leisure time [4]	Restaurants	Collected	Own measurements	Sept 02, Sept 04, Sept 05	11	Sept 02	13	Sept 04	18	Sept 05
			Cafes				3		7		17	

[4] Two kinds of initiatives can be distinguished for better interpretation: 1. ‘Restaurants’: pizzerias, restaurants and fast foods; 2. ‘Cafes’: cafes, open-air cafes, cake shops or „ice cream shops“.

A.2 QUESTIONNAIRE

Poll carried out within the confines of the TELLUS Project – „Transport & Environment aLLiance for Urban Sustainability" – realized by five cities: Rotterdam (The Netherlands), Berlin (Germany), Göteborg (Sweden), Gdynia (Poland) and Bucharest (Romania), co-financed by the European Union (5th Framework Programme).

DEAR INHABITANTS OF GDYNIA!

WE ENCOURAGE YOU TO FILL IN AN OPINION POLL CONCERNING MODERNIZATION OF THE ŚWIĘTOJAŃSKA STREET. THE RESULTS WILL CONTRIBUTE TO BETTER DEPICTION OF YOUR PREFERENCES AND EXPECTATIONS.

Please, tick chosen answer or fill out place above dotted line.

1) Do you like modernized Świętojańska Street ? a. YES [378] [5] b. NO [38]

2) What do you think of implementation of such elements as:

No.	Element	Favourable	Not favourable	No idea
1.	New lighting system	379	21	16
2.	Widened pavements	362	38	16
3.	Bollards restricting parking	316	77	23
4.	New trolley bus traction system	324	36	56
5.	Open-air cafes	323	57	37
6. (a)	Elements of small architecture: - fixed bicycle stands	348	42	26
(b)	- benches	379	28	9
(c)	- frames protecting trees	385	23	8

3) Do you visit/plan on visiting the Świętojanska Street more frequently than before its modernization ?

a. YES [275] b. NO [141]

4) What is the reason of your visiting the Świętojanska Street ?

a. I commute along it on weekdays (on foot, by bicycle, by trolley bus) [57]

b. I commute along it on weekdays (by car) [36]

c. I go shopping there [140]

d. I like walking there [231]

e. I prefer spending my leisure time in eateries located there (pubs, cafes, fast food restaurants, etc.) [104]

f. Other [101]

5) Other comments and suggestions

.....

Sex: a. Female [239] b. Male [175]

Age: 48 (average)

District of residence:.....

Thank you for filling out this opinion poll.

[5] Numbers printed in pink present data on respondents' answers.

Collection points:

- Box displayed at the Information point in the City Hall of Gdynia, 52/54 Marszałka Piłsudskiego Avenue,
- Offices of District Councils
- Non-governmental Organizations' Centre of Gdynia, [27/31 3 Maja Street, open from Monday to Friday (9 a.m.- 8 p.m.)]

Additional forms of the poll are available in the places mentioned above.

A.3 Additional indicators required by METEOR

There are some differences in case of method of measurement, tools used and sample of interviewed people between Common Core Indicators methodology and this used in Gdynia. For example in Gdynia:

considering preferences and transportation behaviours of Gdynia's inhabitants were used following:

- method : standarized direct interview;
- measuring instrument: questionnaire;
- range: 40 calibrated questions;
- sample: random sample of inhabitants of age 16-75 (about 1% of Gdynia's inhabitants);
- place of research: households

considering Accuracy of PT timekeeping were used following:

- method: observation;
- measuring instrument: measuring cards;
- sample: hidden 60 - minutes observation in random points (bus stops).

Indicator: Perception of PT accessibility

This indicator shows user expectation to PT services. Surveyed persons have to rank their expectations from most necessary to less one.

Unit: index of the value "accessibility perception" of every surveyed person

Table A.3-1: Ranking of traveling postulates

2000	2001	2002	2003	2004
punctuality	punctuality	**accessibility**	**accessibility**	direct
accessibility	**accessibility**	punctuality	punctuality	frequency
frequency	frequency	frequency	frequency	punctuality
direct	direct	direct	direct	**accessibility**
low cost	low cost	low cost	low cost	low cost
convenience	reliability	convenience	convenience	reliability
reliability	convenience	reliability	reliability	quick

Source of measurement: personal interview

max error +/-3%

Indicator: Perception of PT security

This core indicator measures the perceived security in PT vehicles as well as at and around PT stops, among PT users. In Gdynia PT users were asked about security in PT vehicles. Unfortunately question asked on security in 2004 was different than question in 2002 so it was hard to compare answers.

Unit: index

In 2002 Q.: Do you feel secure in the PT vehicles?

Table A.3-2: Perception of PT security

	2002
Always secure	19.80%
Rather secure	74.62%
Neither secure nor insecure	2.54%
Rather insecure	2.54%
Always insecure	0.51%

Source of measurement: personal interview

max error +/-3%

In 2004 Q.: Have you ever felt as being in danger, or have you been robbed or assaulted when traveling by PT in 2004?

More than 92% of interviewed passengers said they had not felt as being in danger and had not been robbed or assaulted when traveling by PT in 2004. 3% of respondents were robbed, 0.6% were assaulted whilst 4% felt as being in danger.

Indicator: Accuracy of public transport time keeping

Service reliability: percentage of occurrences in which a (public transport) service arrives within a given interval around timetable times.

Source: surveys and data from public transport companies.

Unit: % and # of the total arrival times per year that are within a given interval around the time shown in the timetable.

Table A.3-3: Delays from schedule in PT

	2000	2001	2003	2004
Rides not performed	0.08%	0.05%	0.03%	0.05%
Rides accelerated to 1 m	1.14%	1.17%	0.52%	0.57%
Rides delayed to 3 m	21.16%	26.60%	26.24%	26.74%
Rides delayed over 3 m	8.11%	18.20%	10.18%	10.88%

Source of measurement: observation

max error +/-1,5%

Indicator: Quality of public transport services

This indicator represents the user perception of the overall quality of public transport services.

Unit: index of the value "perception" of every surveyed person.

Source: questionnaires.

Table A.3-4: General opinion on Public Transport

	2000	2001	2002	2003	2004
very good	13.74%	-	16.23%	-	15.3%
good	69.22%	-	65.86%	-	68.9%
satisfactory	11.49%	-	10.31%	-	8.9%
bad	0.70%	-	0.53%	-	0.6%
not able to define	4.85%	-	7.08%	-	6.4%
Average mark (five point scale)	4.01	-	4.05	-	4.06

Indicator: Average occupancy

In Gdynia only data concerning average number of passengers per one ride is available.

Unit: average number of passengers per one ride

Source: survey (or counts)

Table A.3-5: Number of passengers of PT per one ride

2000	2001	2002	2003	2004
63.05	61.55	58.83	59.16	59.64

Indicator: Operating revenues

For a complete picture of the economic performance of new (integrated) measures, this core indicator needs to be analysed in conjunction with core indicator 2 "operating costs per PT passenger".

Unit: zl/pkm (other units such as zl/vkm or zl per PT passenger can be derived)

Table A.3-6: Operating revenues of the Public Transport Authority in Gdynia (ZKM)

year	Revenues per		
	Vehicle-kilometer	Passenger-kilometer	PT passenger
2000	2.77	0.051	0.47
2001	2.97	0.056	0.51
2002	3.04	0.062	0.53
2003	3.13	0.059	0.55
2004	3.37	0.064	0.57

Indicator: Operating costs

For a complete picture of the economic performance of new (integrated) measures, this core indicator needs to be analysed in conjunction with core indicator 1 “operating revenues per PT passenger”.

Unit: zł/pkm (other units such as zł/vkm or zl per PT passenger can be derived)

Table A.3-7: Operating costs of the Public Transport Authority in Gdynia (ZKM)

year	Operating costs per		
	Vehicle-kilometer	Passenger-kilometer	PT passenger
2000	3.95	0.073	0.66
2001	4.33	0.082	0.74
2002	4.59	0.093	0.85
2003	4.62	0.087	0.81
2004	5.05	0.095	0.87