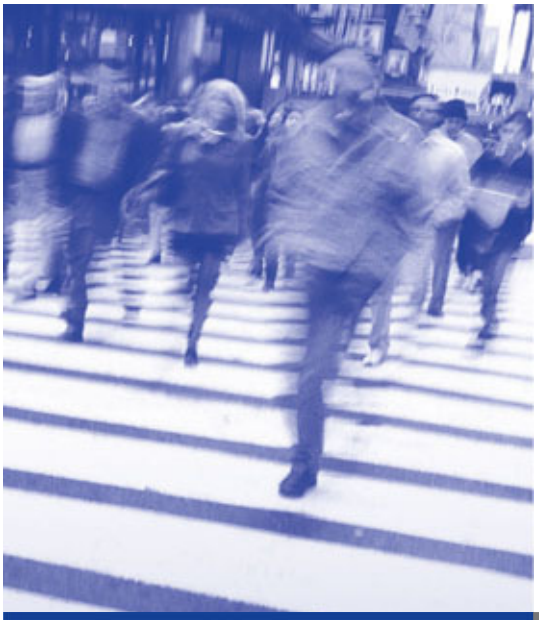

CiViTAS
Cleaner and better transport in cities

ARCHIMEDES

Final Evaluation Report

ANNEX E:

IASI MERTs

(D10.3 Final Evaluation Report – Evaluation & Analysis)
Ver. 1.1

February, 2013

THE CIVITAS INITIATIVE
IS CO-FINANCED BY THE
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IASI MERTs

The following is a compilation of all Measure Result Templates (MERT) developed by Iasi as part of the ARCHIMEDES project:

ARCHIMEDES measures in IASI		
CIVITAS theme	**M/no**	**Measures**
Alternative fuels & clean vehicles	5	Biofuels - Use of bio-methane in Iasi
Collective transport & intermodal integration	11	New School Bus Link in Iasi
	12	Improved Ticketing in Iasi
	13	Improved PT Information in Iasi
	14	Bus Priority Measures in Iasi
	15	Business District Shuttle Bus in Iasi
Demand management	22	Access Control to an Historic Centre in Iasi
Influencing travel behaviour	35	Education and Promotion Programme in Iasi
	36	Public transport user forum in Iasi
	37	School Travel Plans in Iasi
	38	Travel Information Telephone Service in Iasi
Safety, security & health	48	Provision for disabled persons in Iasi
Innovative mobility services	59	City Cycle Routes in Iasi
Energy-efficient freight logistics	66	Efficient Goods Distribution in Iasi
Transport telematics	76	Bus Management System in Iasi
	77	Public Transport Planner in Iasi

Executive Summary

The Municipality of Iasi aims to prove that the usage of alternative fuels can contribute to peoples' quality of life by reducing pollution levels in areas of dense traffic. The introduction of alternative fuels in public transport can prove that cleaner public transport is in direct connection with improved health of citizens.

As part of this measure 30 buses belonging to the public transport company have been transformed to work on LPG instead of diesel oil, because LPG does not contain pollutants like benzene, sulphur, and lead, and because this type of fuel also generates lower quantities of NO_2, CO and particulate matter (PM). An LPG fuel station has been acquired and installed.

To assess the level of air pollution, a private company measured air quality in five places along the CIVITAS corridor (the data recorded in four of them have direct impact on the LPG-related study). Another private company measured the emissions generated by a diesel-powered bus and by the same bus after it was transformed to work on LPG. Based on the results of the air quality measurements, the Technical University of Iasi elaborated a study of emission levels by examining the impacts of LPG use in public transport on air quality.

The conclusions of the study revealed that:

- the CO level decreased in 3 of 4 locations by a maximum of 14% and a minimum of 4,2%;
- the NO_2 level decreased in all 4 locations, recording a maximum decrease of 8,8% and a minimum of 6,5%;
- the PM level decreased in all 4 locations by a maximum of 13% and a minimum of 7,2%.

Comparing the emissions generated by an LPG bus with those generated by a diesel-powered bus we noticed:

- a decrease of CO emissions by 42 %;
- a decrease of NO_2 emissions by 26,5 %;
- a decrease of PM emissions by 34,02%;
- an increase of CO_2 emissions by 26%.

Surveys were conducted to assess awareness level and quality of service indicators. The results showed that:

- the awareness level increased to 45% in 2012 compared to 19% recorded in 2009.
- regarding the quality of service indicator:
  - the percentage of the respondents who declared that pollutant emissions had a major impact on them was 63% in 2009 and 57% in 2012;
  - the use of environmental-friendly public means of transport led to an improvement in quality of the transport service (perceived by 80% of the respondents in 2009 and by 92% in 2012);
  - air quality in public transport stops was perceived as improved (19% of the respondents thought in 2009 that it was good, and 26% in 2012).

A campaign was organised in schools and universities to demonstrate the impact of alternative fuels. Posters highlighting the benefits of using alternative fuels were placed in public transport vehicles, stops, and on ticket kiosks.

The following can be regarded as lessons that were learnt during the implementation of this measure:

- before implementing such a measure, a thorough analysis has to be conducted and the following should be considered: implementation costs, availability of an LPG station in the immediate vicinity of the bus depot or possibility to install an LPG station within the bus depot, future opportunities to buy new and more environmental-friendly buses;
- adjustments must be performed on the LPG equipment regarding air-LPG optimal ratio for engine function;
- maintenance workers and bus drivers must be trained.

On the basis of the results obtained from assessing the measure indicators and of the success of the campaign, we can conclude that the measure was successfully implemented.

IAS 5 – LPG Buses

A Introduction

A1 Objectives

The measure objectives are:

(A) High level / longer term:
- To promote high quality, high efficient and more attractive public transport.

(B) Strategic level:
- To lay the foundations for the introduction of LPG vehicles.

(C) Measure level:
- To make a study on air quality measured in four locations on the CIVITAS corridor.
- To reduce emissions by converting 30 diesel buses, i.e. 30% of the bus fleet at the level of the year 2009, as follows:
  NO_2 by 25% CO by 15% CO2 by 10% PM by 15 %
- To install an LPG filling station.

A1.2 Target groups

Since the largest universities, their campuses, and many schools and kindergartens are placed along or in the proximity of the CIVITAS corridor, the main target groups of this measure are school and university students.

Beside young people, we planned to attract also inhabitants of Iasi who use private cars as daily means of transport.

Public transport routes also pass by touristic places of interest, which makes tourists another target group for this measure.

A2 Description

The aims of this measure were the following:

- to modify 30 buses, which represent 30% of the bus fleet belonging to the public transport operator at the level of the year 2009, so as to work on LPG instead of diesel oil, because LPG does not contain pollutants like benzene, sulphur, lead, and because it also reduces NO_2, CO and CO_2 emissions.

- to measure, before and after the implementation of this task, the level of pollutant emissions from the buses that run on the CIVITAS corridor in the context of the large number of cars passing through this corridor, around half of whose length is on a slope;

- to use only the LPG station purchased within this measure in order to fuel the buses;

- to organise a campaign in schools and universities in order to demonstrate the impact of alternative fuels. Posters highlighting the benefits of using alternative fuels were placed on public transport vehicles and stops and on ticket sales kiosks.

A3 Person in charge for evaluation of this measure

Names of persons	Mocanu George – implementation Cristi Simionescu – evaluation
Name of organization	IASI, PTI
Direct telephone	+40744926385, + 40332409861
e-mail	mocanugrg@yahoo.com, s_tehnic@yahoo.com

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – the public transport company had used only diesel oil as fuel for the public transport buses before this measure was implemented. The replacement of diesel oil with LPG is a new approach to public transport in Iasi from an environment-oriented perspective, and tries to solve the pollutant emissions problem, which has a negative impact on the city's population.
- **Use of new technology/ITS** – the transformation of buses consisted of installing LPG-related equipment, which represented a new technology regarding LPG usage for fuelling high-capacity vehicles.
- **New economic instrument** – since the price of diesel oil is higher than the price of LPG, the use of LPG was meant to reduce fuel costs for the public transport company.
- **New policy instrument** – the improvement of air quality is a subject of debate also at political level, being part of the Regional Strategic Development Plan of the City of Iasi.
- **New physical infrastructure solutions** – an LPG fuel station was purchased and installed.

B2 Research and Technology Development

The Study of Emission Levels – a research study in Iasi for the measurement of emission levels of buses running along the CIVITAS corridor – was carried out before and after the implementation of this measure, so that it was possible to compare the data in order to measure the reduction of pollutant emissions. Further details are provided below.

B3 Situation before CIVITAS

Before this measure was implemented, all buses belonging to the public transport company were fuelled with diesel oil. Neither had any research been made to reveal to what extent diesel-powered buses pollute the environment, nor had any actions been taken to reduce pollutant emissions of buses.

B4 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: (*before – April 2009, after – September 2009 and October 2010***) -** the study of pollutant emissions generated by buses running on diesel oil and by buses running on LPG was carried out to assess the measure indicators.

Stage 2: (*before – December 2009, after – June 2011 and June 2012*) **–** air quality was measured at four strategic locations on the CIVITAS corridor.

Stage 3: (*March 2009-July 2009*) – the tender documentation was elaborated and the tender procedure for purchasing an LPG station was completed within this period. The contract was signed in July 2009. The implementation phase lasted till October 2009.

Stage 4: (*December 2008 – June 2009*) – the tender documentation was elaborated and the tender procedure for transforming 30 buses to operate on LPG was completed. The contract was signed in June 2009. The first converted bus was put into service in July 2009, and the other 29 in March 2010-April 2011.

Stage 5: Evaluation – the data for the assessment of the following indicators was collected in:

- before: April 2009; after: September 2009 and October 2011 – a specialised company measured bus emissions directly at the exhaust pipe while the bus was

in traffic. The first converted bus was used for the measurements of emissions in the three periods (before/after/after).

- before: December 2009; after: June 2011 and June 2012 – another specialised company measured air quality in bus stops on the CIVITAS corridor;
- before: April/May 2009; after: February 2011 and February 2012 – surveys were conducted for determining the awareness level and quality of service.

Study of emissions levels

The Technical University of Iasi has conducted a research study to measure the emission level at various strategic locations on the CIVITAS corridor, based on traffic data provided by the public transport company. In order to get as accurate results as possible, Iasi City Hall searched for a company able to make tests in order to measure emission levels. Having failed to locate a local company that would make measurements of polluting emissions in certain points on the CIVITAS corridor, Iasi City Hall extended its search to other counties.

The company Valimar Med from Bacau was finally appointed to perform these measurements.

The research study to measure the emission level was conducted in 2009 in 5 locations in the city (see details in Annex 1), four of which are on the CIVITAS corridor, and the fifth, which corresponds to Measure IAS 22 (Access Control to a Historic Centre), is in its immediate proximity.

The locations where the air quality measurements were conducted are shown in Fig. 1.

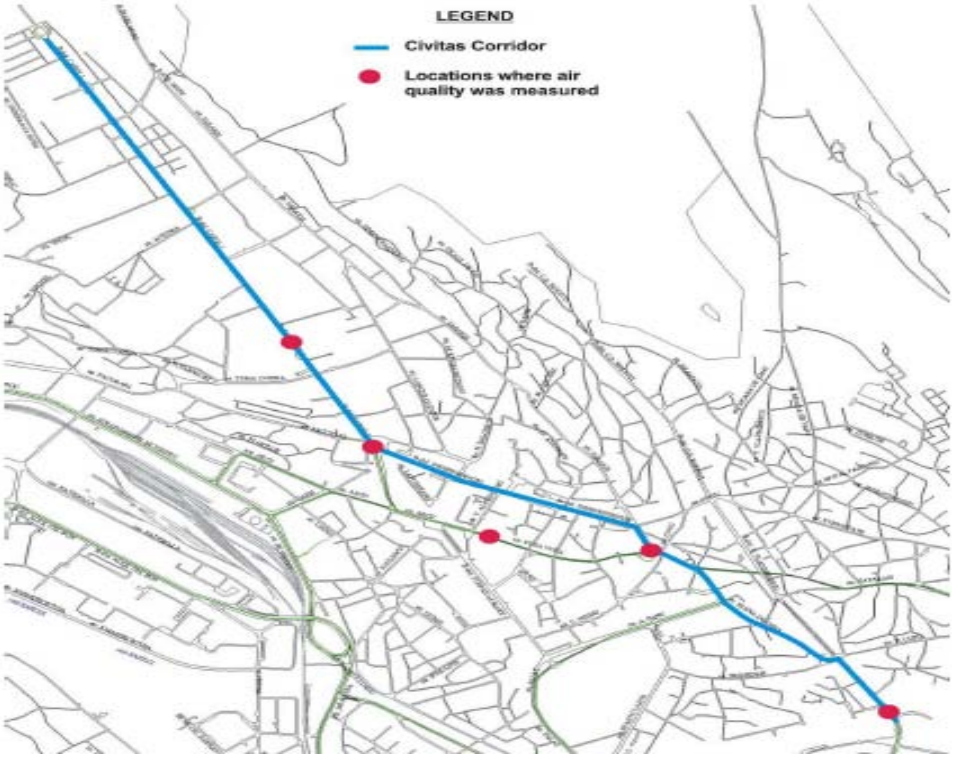


Fig. 1. Map of the CIVITAS corridor in Iasi showing the locations of air quality measurements

LPG fuelled public transport

The initial objectives of this measure was to contribute to the EU RTFO requirements by using first generation biofuels in order to create the basis for the use of second generation biofuels and of EEV vehicles. However, LPG was used in the end as an alternative fuel source for buses.

As part of this task, Iasi invested in the conversion of 30 buses type Renault R 312 to run on LPG.

ARCHIMEDES has contributed to planning, monitoring and supporting equipment costs for the conversion of these 30 buses, i.e. for the transformation of the entire fuel supply equipment and infrastructure.

In order to convert the 30 buses (Fig. 2), several technical changes had to be performed, especially on the engine, body and electrical installation.

Fig. 2 Renault R 312 bus

The changes made to this type of bus from a technical viewpoint in order to run on LPG are presented in Annex 2.

LPG station

This project was aimed at using alternative fuels in public transport to lay the foundation for a new generation of EE Vehicles. Therefore we installed an “LPG filling station type SKID (monobloc) for vehicles” with two containers (Fig. 3).

Fig. 3 LPG station

Technical details on the components of the LPG filling station are presented in Annex 3.

Mass media (written press, radio, TV) informed people about the implementation of the measure, sustaining the benefits of LPG use.

Examples of media reactions are shown in Annex 4.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure no. IAS 35** – measure no. 5, and especially the study of emission levels generated important data that was used in the campaign to promote ecological public transport.
- **Measure no. AAL 01a and DSS 4** – sharing of knowledge with parallel activities on biofuels in Aalborg and Donostia San Sebastian has added further value to the RTD and DEMO tasks in this measure.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

The aim of this measure is to lay the foundations for the introduction of alternative fuels and EEV vehicles, and to promote high quality, high efficient and more attractive public transport. The measure has had a positive impact on the environment, since it resulted in reduction of pollutant emissions. If public transport services were used more frequently, this would lead to a decrease of the number of private cars, and if we changed public transport vehicles into EEV vehicles, we would reduce pollutant emissions. However, it is not expected that this isolated measure would have a direct impact on the number of passengers (increased patronage is achieved by means of the combination other PT measures directed towards improved service operation). Because of this no indicator on public transport passengers is included in the impact evaluation.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
1	ECONOMY	~~**Benefits**~~	~~Operating Revenues~~	~~Operating revenues~~	~~Revenues per 100 vkm~~	~~Euros/100 vkm~~
2a		Costs	Operating Costs	Operating costs	Costs per 100 vkm	Euros/100 vkm
2b			**Capital Costs**	**Capital costs**	**costs per bus**	**euro / bus**
2c			**Maintenance costs**	**Maintenance costs**	**costs per bus**	**euro / bus**
5	ENVIRONMENT	Pollution/Nuisance	Air quality	CO levels	CO concentration	quantitative, measurement
6				NO2 levels	NO_2 concentration	mg/Nm3, quantitative, measurement
7				Particulate levels	PM 10 and/or PM2.5 concentration	mg/Nm3, quantitative, measurement
8		Pollution/Nuisance	Emissions	CO_2 emissions	CO2 per 100 vkm	mg / Nm3
9				CO emissions	CO per 100 vkm	mg / Nm3
10				NO_2 emissions	NO_2 per 100 vkm	mg / Nm3
13	SOCIETY	Acceptance	Awareness	Awareness level	survey	Index (%),
19	TRANSPORT	Quality of service	Quality of service	Quality of service	survey	Index (%),

Operating revenues have been omitted because the revenues are expected to remain the same in both cases: LPG and diesel oil. Increased revenues would come from modal shift towards public transport, which is not likely to be caused by the use of LPG instead of diesel oil (the core of this measure) but from operational improvements or other conjunctional issues

C1.1.2 Methods for evaluation of indicators

No.	Indicator	Target Value	Source of Data and Methods	Frequency of Data Collection
2a	Operating costs	Operating costs for LPG lower comparing to operating costs for diesel oil + operating costs for the LPG filling station	Statistic analysis of the public transport company's internal data by comparing operating costs for diesel-powered buses to those for LPG buses	Annually
2b	Capital costs	The cost of the initial investment in: the conversion of 30 buses, the purchase of the LPG station and the training of personnel.	Resulted from the financial offer of the company that supplied the LPG equipment necessary for transforming the buses and of the company that supplied the filling station.	Once, when the contract was signed
2c	Maintenance costs	Maintenance costs lower for LPG buses comparing to diesel-powered buses + Maintenance costs for the LPG station	Statistic analysis of internal data provided by the public transport company by comparing maintenance costs for diesel-powered buses to those for LPG buses	Annually
5	CO levels	Decreasing of CO levels after the implementation of the measure	A specialised company made measurements in four locations along the CIVITAS corridor before and after the buses were converted. The study of emission levels, which is described in Annex 1, was based on the values obtained through these measurements. Because public transport buses represent a small part of the total number of vehicles that cross the CIVITAS corridor, the conversion of 30 buses on LPG did not have a significant impact on air quality	Before – December 2009 After – June 2011 and June 2012
6	NO_2 levels	Decreasing of NO_2 levels after the implementation of the measure		
7	Particulate matter levels	Decreasing of PM levels after the implementation of the measure		
8	CO_2 emissions	Reduction of 10%	A different specialised company made measurements in traffic at the exhaust pipe of a bus along one route on the CIVITAS corridor during one day., before and after the bus was converted	Before – April 2009 After – September 2009 and October 2011
9	CO emissions	Reduction of 15%		
10	NO_2 emissions	Reduction of 25%		
11	PM emissions	Reduction		
13	Awareness level	Increase of awareness level	A specific survey was conducted to assess these indicators. The interviews* were carried out by students in a public transport stop during five working days, before and after the measure implementation. 100 persons were interviewed in each wave. Following some details of the survey campaign: **April/May 2009.** The survey was conducted (using 100 questionnaires) on passengers in the proximity of a public transport stop, and it addressed mostly school and university students, but also other people. In order to asses the awareness level, the respondents were asked if they had heard about the CIVITAS project and if they knew that 30 buses were going to be converted	Before - April/May 2009 After – February 2011 and February 2012

No.	Indicator	Target Value	Source of Data and Methods	Frequency of Data Collection
19	Quality of service	Increase of quality of service	on LPG and that they were to be fuelled from an LPG station as part of this measure. For the assessment of the quality of service, the respondents were asked if the public transport company used polluting means of transport, if they these should be replaced with more environmental-friendly vehicles, if the use of LPG instead of diesel oil would contribute to the decrease of the pollution level, etc. **February 2011 and February 2012.** Another set of 100 questionnaires was used for face-to-face interviews in both instances. Students conducted the survey in the same place as in 2009. The questions remained the same, but they were adapted to the stage the measure was in (already implemented).	

* The questionnaire used for the interviews is to be found in Annex 5.

The above emission indicators were measured only for one type of buses (Renault R312) transformed to work on LPG and operating on the CIVITAS corridor.

C1.1.3 Planning of before and after data collection

Evaluation Task	Indicators Involved	Completed By (Date)	Responsible Organisation And Person
	Operating costs	N.A.	PTI – Dana Cernat
	Capital costs	N.A.	PTI – Dana Cernat
	Maintenance costs	N.A.	PTI – Dana Cernat
	CO levels	M 16	TUI
	NO2 levels		TUI
	Particulate levels		TUI
	CO2 emissions	M 8	PTI
	CO emissions		PTI
	NO_2 emissions		PTI
	PM emissions		PTI
	Awareness level	M 8-M9	TUI
	Quality of service	M 8-M9	TUI
	Operating costs	Annually	PTI – Dana Cernat
	Capital costs	M9 and M10	PTI – Dana Cernat
	Maintenance costs	Annually	PTI – Dana Cernat
	CO levels	M34, M46	TUI
	NO2 levels		TUI
	Particulate levels		TUI
	CO2 emissions	M13, M38	PTI
	CO emissions		PTI
	NO_2 emissions		PTI
	PM emissions		PTI
	Awareness level	M30, M42	TUI
	Quality of service	M30, M42	TUI
D12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 42	
D12.4 Final version of results template available	All indicators	Month 44	

C1.2 Establishing a baseline

As part of this measure 30 diesel-fuelled buses were converted to run on LPG.

The year 2009 was used as a baseline year for comparing the evolution of the indicators.

The 30 converted buses run on the same routes on the CIVITAS corridor as before, and their average annual mileage is similar to the “before” situation. We can take it for granted that the operating conditions of the buses are the same (Table 1), the only difference being the operating conditions of the motors (specific fuel consumption, maintenance labour costs).

Bus	Average annual mileage of a bus [km]	Specific fuel consumption [litres / 100 km]
Diesel	61,500	43.00
LPG	61,500	91.70

Table 1 – Mileages and fuel consumptions

The average mileage of a bus is 61,500 km/year, and the average mileage of the whole fleet of 30 R312 converted buses is 1,845,000 [km/year/fleet].

On analysing the data provided by the transport company of Iasi on the operation of the 30 converted buses the following has been determined:

- The initial costs of the investment are for the conversion of the buses, for the additional infrastructure (LPG station), and for the training of the staff for using the new technology. The reference capital costs are considered to be "0" (the case when no investments are made).
- The operating costs are specific only to R312 buses before and after their conversion, and they take into account the following: the fuel consumption for the two types of motors – diesel and LPG (the other operating costs, which are common to both types of motors, are similar, and were not taken into account), the fuel price, and the annual mileage of the buses.

  In this context, the evolution of operating costs for both scenarios (CIVITAS measure and BaU, respectively) is influenced by the annual evolution of diesel oil price between 2009 and 2012, which we tried to estimate for the interval 2013-2015 (Table 2 and Fig. 4). This estimation was based on applying the annual trend rate on the previously recorded annual data, in the context where fuel consumption and average annual mileage remain the same.

						estimated		
Price evolutions		2009 (Jan.)	2010 (Jan.)	2011 (Jan.)	2012 (Sept.)	2013	2014	2015
Diesel	Euro/litre	0.79	0.92	1.15	1.27	1.40	1.55	1.71
	Annual trend rate	---	+16.46%	+25.00%	+10.43%	+10.43 %		
LPG	Euro/litre	0.39	0.50	0.60	0.69	0.79	0.91	1.05
	Annual trend rate	---	+28.21%	+32.00%	+15.00%	+15.00 %		

Source: http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm, http://www.energy.eu/#top

Table 2 Evolution of fuel prices

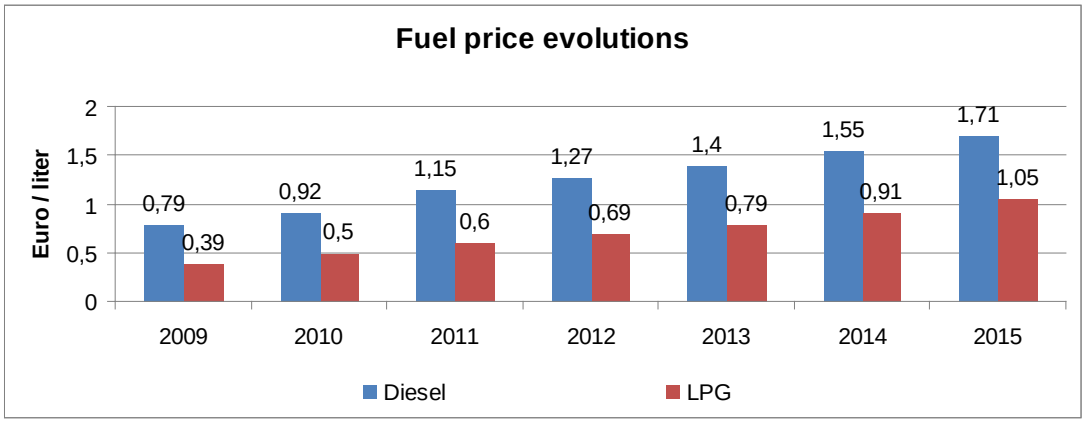


Fig. 4 Evolution of fuel price

- Maintenance costs resulted from the maintenance operations performed only on the engines of the R312 buses: Diesel and LPG (the other maintenance costs, which are common to both types of motors, are similar and were not taken into account).
- The pollutant emissions generated by the buses were measured at the exhaust pipe of a bus before and after it was converted by a specialised company to run on LPG. CO2, CO and NO2 emissions were measured by gravimetric techniques (absorption time: 20 hours) and they were determined by standardised spectrophotometric methods, and the particulate matter samples were collected with special filters – all these methods were approved by the Ministry of Environment and by the Ministry of Health. In order to keep the conditions of comparison consistent, the emissions were measured for the same bus that followed the same route on the CIVITAS corridor in both situations (before and after), thus resulting the same conditions of

operation. All emissions were measured along one route on the CIVITAS corridor in one day. Three samples were collected for each emission type, and the arithmetic means of the results were used in the evaluation process.

- Air quality was measured by a specialised company in 4 locations on the CIVITAS corridor in November 2009. The measurements were made in bus stops using authorised devices (Annex 1). All air quality measurements (see Annex 1 - Study of emission levels) were made in bus stops along the CIVITAS corridor in one day. Six samples were collected for each emission type (CO, NO_2 and PM), three during the day and three during the night, and the results that were used in the evaluation process were their arithmetic mean for each type of emission.
- In order to assess the awareness level, the acceptance level and the quality of service we conducted surveys among passengers before measure was implemented.

In order to assess the awareness level, the acceptance level and the quality of service, surveys were conducted among the inhabitants of the city of Iasi. The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people) after the measures had been implemented, thus making it possible to compare the results of the “before” and “after” situations. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

The interviews were carried out in the same public transport stop located on the CIVITAS corridor during the three periods the surveys took place in (one before the implementation of the measure and two after). We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small sample size and area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

C1.3 Methods for Business as Usual scenario

In case of BaU scenario no investments for reducing pollutant emissions are made. This situation is the same for the “before” data.

For the economic indicators in the BaU scenario, the values of the “before” situation are updated with the general inflation rate, and the values of the operating costs are updated with the evolution rate of fuel price. These evolution rates had to be estimated for the coming perioud, hence the risk that the annual evolution estimated for these economic indicators is not accurate.

The inflation rate is published by INS (the National Institute of Statistics) for the period 2009-2011. The forecasting for 2012-2014 was made by BNR (the National Bank of Romania). For 2015 we estimated that the inflation rate would be the same as that estimated for 2014 (Table 3).

	INS			BNR			estimated
Annual inflation rate	2009	2010	2011	2012	2013	2014	2015
	5.59%	6.09%	5.79%	5.32%	6.89%	6.60%	6.60%

Table 3 - Annual inflation rate

The risks of the analysis for both situations (CIVITAS measure and reference case/BaU) consists in the estimation of the evolution of the coefficients for the annual update of the economic indicators – inflation rate and fuel price – with major implications on operating costs. The inflation rate can be predicted with some accuracy – it increases by 1%-2% each year; on the other hand, the evolution of fuel price has an irregular dynamics, with variations between 25% and 30% from one year to another, therefore accurate estimations are difficult to make.

C2 Measure results

C2.1 Environment

Table C2.1.1: Air quality

The measurements for the "after" situation were made in the same locations (bus stops) as for the "before" situation.

Indicator	Location	Before (2009)		After (2011)		After (2012)	
		12a.m.-2.30 p.m	23p.m.-0.45a.m	12a.m.-2.30p.m	23p.m.-0.45a.m	12a.m.-2.30 p.m	23p.m.-0.45a.m
5, CO levels (mg/m^3)	Tudor Vladimirescu	1.667	1.267	1.823	1.296	1.798	1.280
	Tg. Cucu	2.067	1.533	1.999	1.389	1.98	1.303
	Casa de Cultura a studentilor	2.067	1.267	1.968	1.195	1.927	1.109
	Univ. Al. I. Cuza	1.900	1.367	1.789	1.297	1.634	1.224
6, NO_2 levels (mg/m^3)	Tudor Vladimirescu	2.490	1.800	2.350	1.680	2.27	1.618
	Tg. Cucu	2.110	1.840	2.010	1.750	1.943	1.690
	Casa de Cultura a studentilor	2.930	2.070	2.810	1.950	2.740	1.900
	Univ. Al. I. Cuza	2.250	1.300	2.110	1.230	2.100	1.210
7, PM (mg/m3)	Tudor Vladimirescu	0.239	0.082	0.224	0.078	0.208	0.074
	Tg. Cucu	0.306	0.130	0.282	0.124	0.267	0.121
	Casa de Cultura a studentilor	0.259	0.100	0.243	0.094	0.236	0.091
	Univ. Al. I. Cuza	0.305	0.109	0.292	0.103	0.283	0.100

For the above-mentioned indicators the measurements were made right in stops along the CIVITAS corridor, at 1.5 m above ground.

A BaU scenario cannot be generated for these indicators because no relevant comparison can be made, since no measurements were made for determining air quality in the same conditions as with the measurements for this measure.

Air quality indicators are monitored in Iasi by means of four automatic measurement stations, but they are not located on the CIVITAS corridor. Moreover, measurement conditions differ. The distance from these stations to the corridor, the circulation of air masses and the dispersion of pollutant emissions in the atmosphere make it irrelevant to compare the data recorded in the two situations.

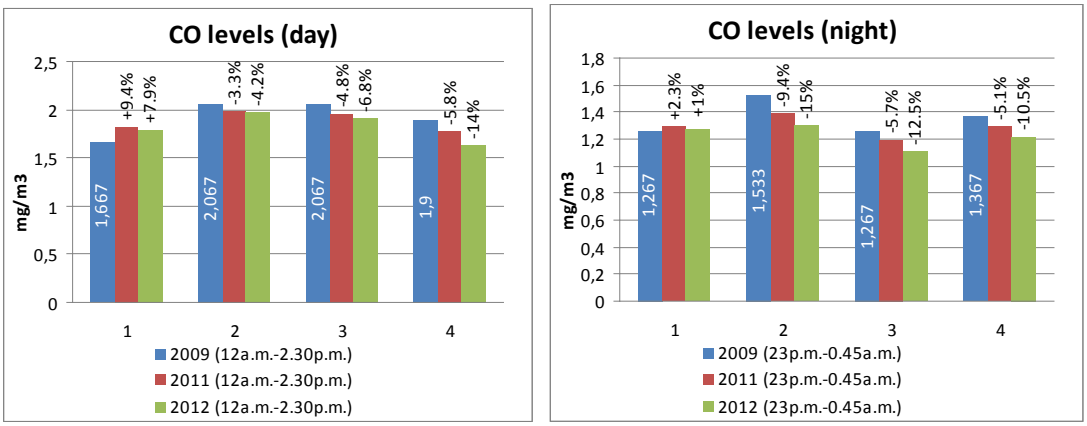


Fig. 5 CO levels (mg/m3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia Monastery – bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University (bus stop)

On looking at the evolution of CO level during the day and the night (Fig. 5), before and after the implementation phase, we noticed that this level decreased in 3 places where measurements were performed. The maximum reduction during the day was recorded in the area of Al. I. Cuza University; the value was 14% lower in 2012 compared to the value of 1.9 mg/m^3 measured in 2009. The maximum reduction during the night was recorded in the area of Tg. Cucului, where the value was 15% lower in 2012 compared to the value of 1.533 mg/m^3 measured in 2009. In the area of Tudor Vladimirescu, the level of CO increased by over 9% in 2011, and by over 7% in 2012 compared to the value of 1.667 mg/m^3 recorded in 2009. A possible reason is that this area is located at one end of the CIVITAS corridor where there are many warehouses, a mall and other stores. The same increase tendency is recorded also during the night.

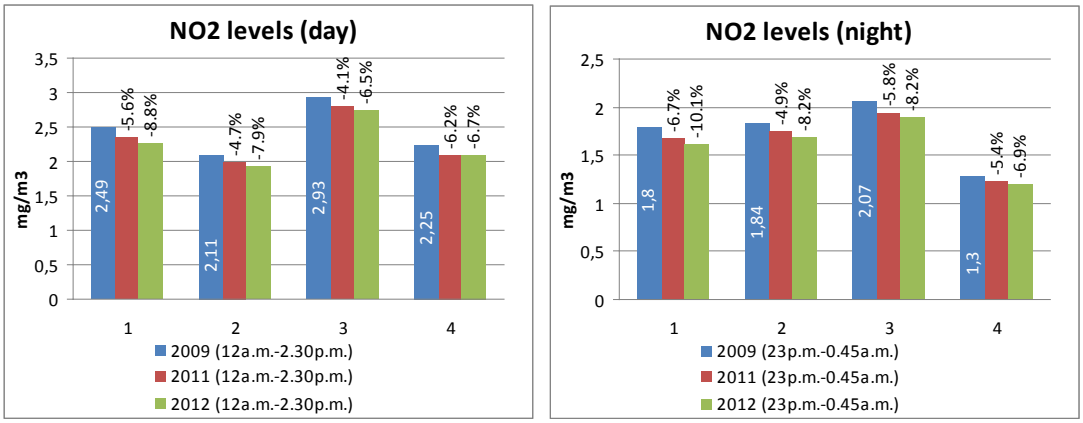


Fig. 6 NO_2 (mg/m^3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia monastery – bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University

On analysing NO_2 level in all 4 places (Fig. 6), we see that this level decreases both during the day and during the night. The maximum value is recorded in the area of Tudor Vladimirescu: over 8% during the day and over 10% during the night. The minimum reduction during the day was recorded in Students' Culture House area, 6.5% lower in 2012 compared to the value of 2.93 mg/m^3 measured in 2009. The minimum reduction during the night was recorded in Al. I. Cuza University area, 6.9% lower in 2012 compared to the value of 1.3 mg/m^3 recorded in 2009.

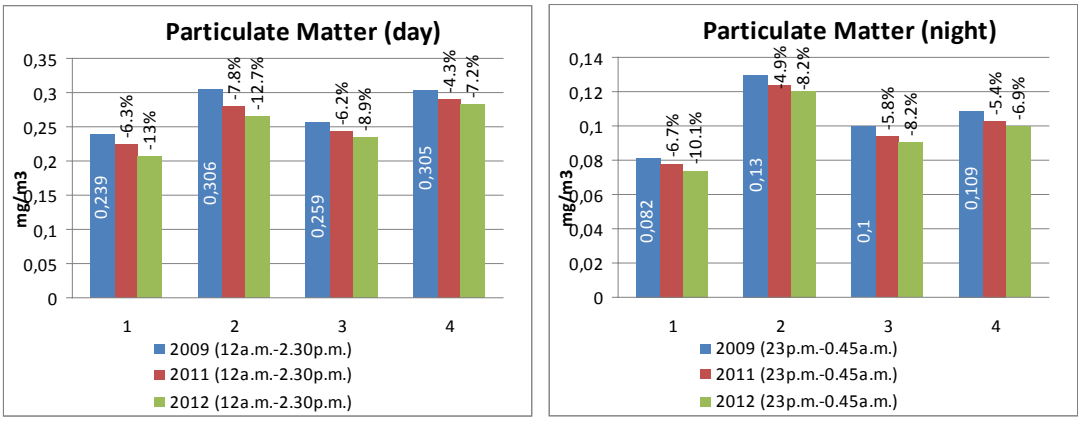


Fig. 7 Particulate matter (mg/m^3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia monastery – bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University

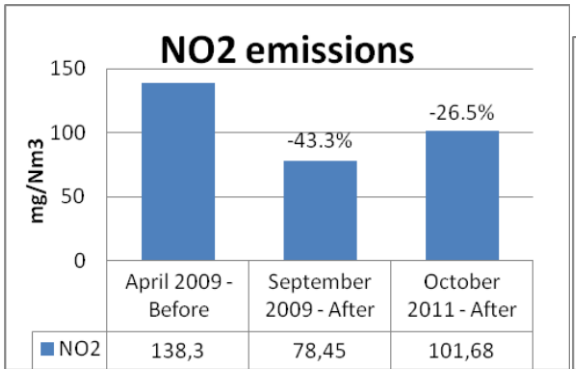
Fig. 7 shows a decrease tendency of PM level in all 4 locations. The maximum decrease of 13% was recorded in 2012 in Tudor Vladimirescu area, and the minimum value was 7.2% obtained in Al. I. Cuza University area in 2012. All these values were compared to the vales recorded in 2009.

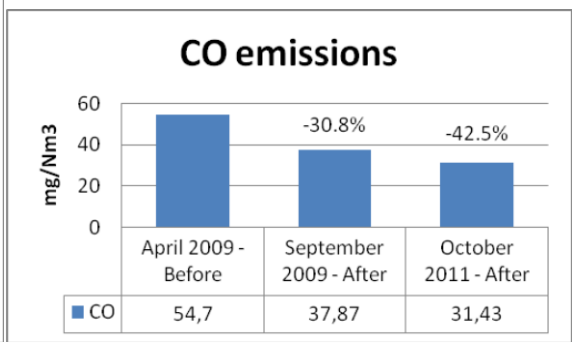
Table C2.1.1: Bus emissions

The measurements for the two "after" situations were made in the same conditions and at the same bus as in the "before" situation.

Indicators mg/m3	Before (2009)	BaU (2009)	After (2009)	After (2011)
NO_2	138.30	138.30	78.45	88.39
CO	54.70	54.70	37.87	31.43
CO_2	88,325	88,325	157,811	111,256
PM	40.60	40.60	8.42	26.67

Indicator mg/m3	Difference: After (2009) – BaU	Difference: After (2011) – BaU
NO_2	-59.85	-49.91
CO	-16.83	-23.27
CO_2	+ 69,486.00	+ 22,931
PM	-32.18	-13.93





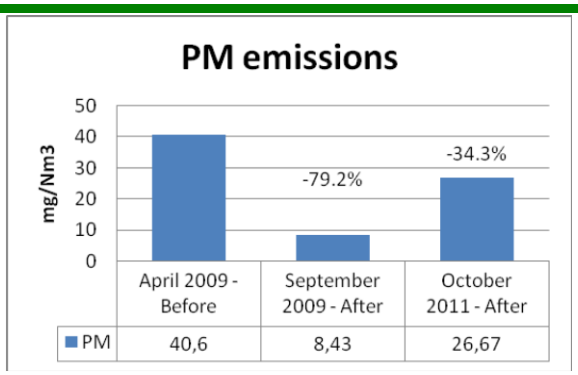


Fig. 8 NO_2, CO and PM emissions measured on a diesel-powered bus (April 2009 – before) and on the same bus after conversion (September 2009, October 2011)

On looking at Fig. 8 we notice a decreased level of NO_2 emissions by an average value of 34.9% (43.3% and 26.5%, respectively). CO emissions decreased by an average of 36.65 % (30.8% and 42.5%, respectively). PM emissions decreased as well, by an average value of 54.48% (78.95% and 34.02%, respectively).

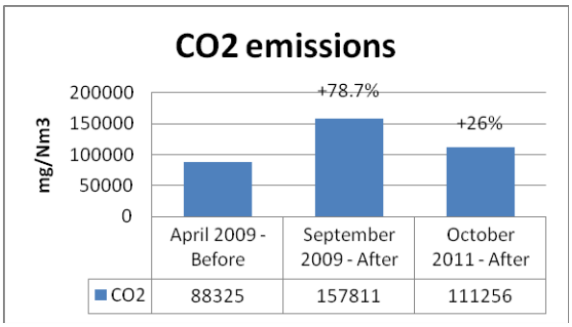


Figure 9 CO_2 emissions generated by the diesel-powered bus (April 2009 – before) and by the converted bus (September 2009, October 2011 – after)

When we measured CO_2 emissions generated by a diesel-fuelled bus and, after its conversion, by an LPG-powered bus, we noticed that these emissions increased by over 78% (Fig. 9). A possible reason is that fuel consumption has doubled from 43 litres of diesel oil to almost 92 litres of LPG.

When we performed the second measurement for the "after" situation, in October 2011, we noticed:
- a decrease of NO_2 and PM emissions compared to the values obtained before the buses had been converted (Fig. 8).
- an increase by only 26% of CO_2 emissions compared to the value obtained before the conversion of the bus (Fig. 9).

In Fig. 9 we notice a non-linear variation of the emission values between the two determinations for the after-situation (September 2009 and October 2011). The two possible reasons are that between the first and the second after data collection, a series of additional adjustments were performed on LPG regarding the optimal air-LPG ratio (λ) for the bus engine and that, within the same period, bus drivers and maintenance workers were trained regarding this new technology.

For the BaU scenario we assume that the values are similar as for the "before" situation, given that no changes are made to the 30 buses and that the average yearly distance covered by the buses stays constant.

C2.2 Economy

Table C2.2.1 – Operating cost

Indicator	Before (2009)	BaU (2010)	BaU (2011)	After (2011)
2a. Operating costs Euro/year/fleet	626,747	729,882	912,353	1,015,119

Indicator	Difference: After –Before	Difference: After – BaU (2010)	Difference: After – BaU(2011)
2a. Operating costs Euro/year/fleet	388,372	285,237	102,766

The operating costs are specific only to R312 buses before and after their conversion (Table 4), and they take into account only the fuel consumption for the two types of motors: Diesel – 33.97 Euro/100 km and LPG – 55.02 Euro/100 km (the other operating costs, which are common to both types of motors, are similar and were not taken into account).

Before (2009; Diesel): 43 liters/100km x 0.79 Euro/litre = 33.97 Euro/100km
After (2011; LPG): 91.7 liters/100km x 0.60 Euro/litre = 55.02 Euro/100km

Operating costs*	Euro / 100km	Euro / year
Before	33.97	626,747
After	55.02	1,015,119

** Given a constant annual average mileage of 1,845,000 km for the entire fleet of 30 buses*

Table 4 – Operating costs

Regarding the values for the BaU scenario, we took into consideration the annual evolution of oil price (Table 5).

2.a Operating Cost Euro/year/fleet	2009 (before)	2010	2011	2012	2013	2014	2015
BaU	626,747	729,882	912,353	1,007,555	1,110,690	1,229,693	1,356,629
After	---	1,015,119	1,167,332	1,336,573	1,708,784	2,080,994	2,392,965

Table 5 – Operating costs – estimated values

Table C2.2.2 – Capital costs

Indicator	Before	BaU	After	Difference: After – Before	Difference: After – B-a-U
2b. Capital costs [Euro]	0	0	1,059,186	1,059,186	1,059,186

The value of capital costs for the implementation of this measure has the following structure:

30 converted buses	31,000 x 30 buses = 930,000	Euro
LPG station	79,186	Euro
Personnel training *	50,000	Euro
Total	**1,059,186**	**Euro**

**The staff were trained as part of another task within the project (T13.5).*

Table 6 – Structure of capital costs

Capital costs are the costs of converting the buses, of purchasing and mounting the LPG filling station, and of training the staff.

The BaU capital costs are considered to be "0" (the case when no investments are made).

Table C2.2.1 – Maintenance costs

Indicator Euro/ fleet / year	Before (2009)	BaU 2010	BaU 2011	After (2011)
2c. Maintenance costs	4,226	4,482	4,742	2,966

Indicator Euro/ fleet / year	Difference: After –Before	Difference: After – BaU (2010)	Difference: After – BaU(2011)
2a. Maintenance costs	- 1,230	- 1,486	- 1,746

Maintenance costs resulted from specific maintenance operations performed only on the engine of R312 buses: Diesel engine – 11.74 Euro/bus/month and LPG – 8.24 Euro/bus/month (the other maintenance costs, which are common to both types of motors, are similar and were not taken into account).

Before (2009/Diesel): working time: 5.7 hours per month; labour costs: 2.06 €/hour => 11.74 €/bus per month
After (2011; LPG): working time: 4 hours per month; labour costs: 2.06 €/hour => 8.24 €/bus per month

The technical maintenance operations of an LPG engine imply fewer manpower hours than those for Diesel engines.

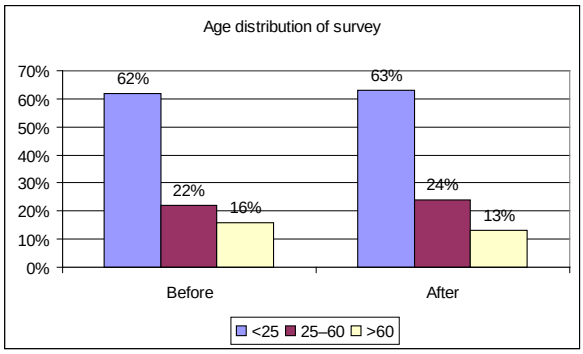
The values for the BaU were obtained from the "before" values updated with the inflation rate corresponding to each year (Table 7).

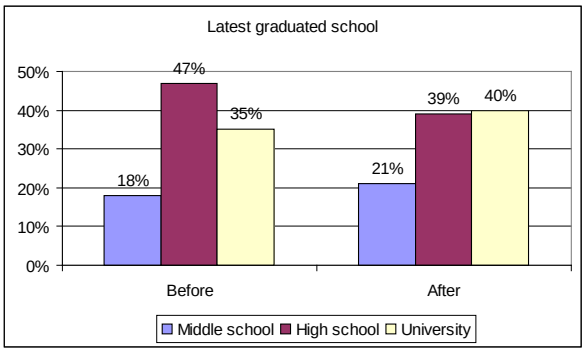
2.c Maintenance costs Euro / fleet / year	2009 (before)	2010	2011	2012	2013	2014	2015
BaU	4,226	4,482	4,742	4,994	5,338	5,690	6,066
After	---	2,966	3,125	3,337	3,560	3,794	4,046

Table 7 – Maintenance costs – estimated values

2.3 Society

The interviews (before / after) for the assessment of the awareness level and acceptance level indicators were carried out by students always in the same place. A characterisation of the respondents is provided in the tables below (Fig. 9).





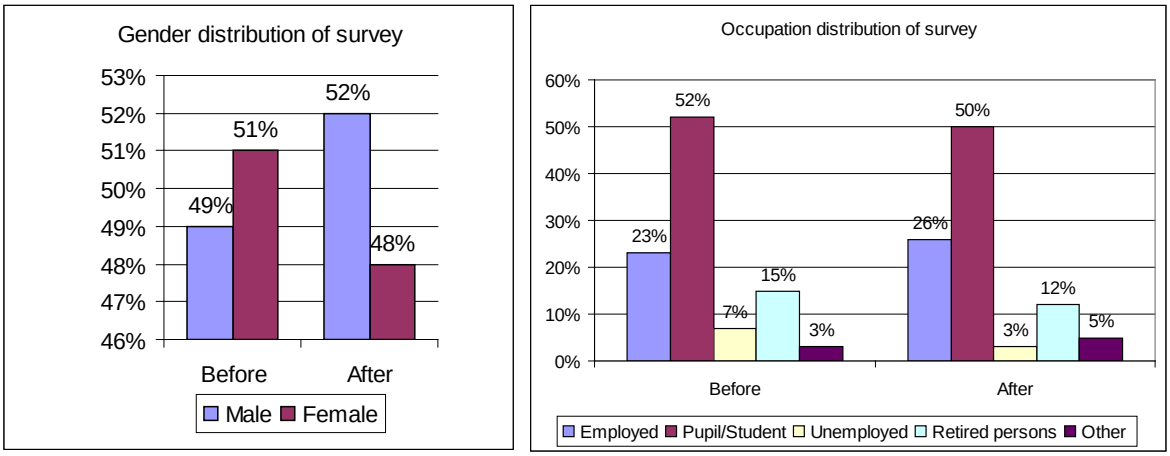


Fig. 10 Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 10), we notice the following evolutions in the "before" and "after" situations:

- Most of the interviewees (around 62%) are below 25 years of age.
- Most of them have attended only high school (over 39%) or also university (over 35%).
- 49% and 52%, respectively, are male, and 51% and 48%, respectively, are female.
- Most of the respondents are students (over 50%), to which a significant percentage of employed people adds (23% and 26%, respectively).

Table C2.3.1: Awareness level

Indicator		Before (2009)	After (2011)	After (2012)
13. Awareness level (%)	1. Yes	19 %	28 %	45 %
	2. No	8 %	6 %	6 %
	3. I don't know	73 %	66 %	49 %

For the assessment of the awareness level indicator, the following questions were asked:
a. Does the city of Iasi participate in the CIVITAS project, which is partially funded by the European Union?
b. Will the public transport company, as part of the CIVITAS project, convert 30 buses so as to run on LPG instead of oil and will it install an LPG filling station?

The values of the awareness level indicator resulted by combining the two questions mentioned above.

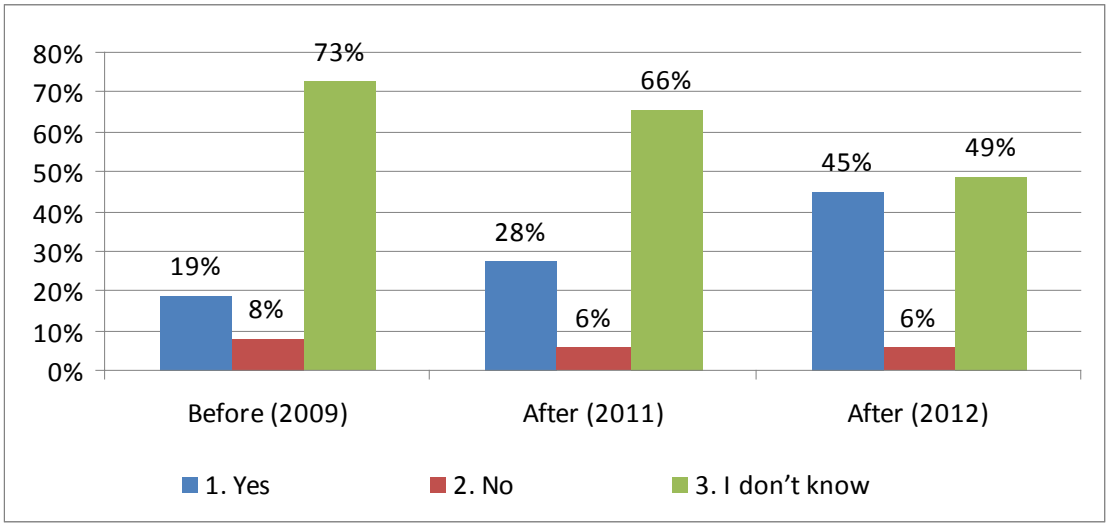


Fig. 11 Awareness level evolution (before: 2009, after: 2011 and 2012)

On analysing the awareness level indicator (Fig. 11), we noticed an increase, from 19% in 2009 to 28% in 2011 and to 45% in 2012, in the number of respondents who had heard about the CIVITAS project, about the fact that 30 buses were to be transformed to work on LPG and that they were to be fuelled from the LPG station. This means that the promotional campaigns organised after the implementation phase had a positive impact on people.

Before the CIVITAS project there had been no regular survey programs to assess public perception regarding public transport services, therefore it is not possible to create a BaU scenario for these indicators.

C2.4 Transport

Table C2.4.1: Quality of service

This indicator was determined through the same surveys. The characterisation of respondents is presented in Fig. 9 above.

The following aspects on the quality of service are regarded as important:

- peoples' perception regarding pollutant emissions (air and noise) generated by public transport vehicles:

Indicator		Before (2009)	After (2011)	After (2012)
15. Quality of service (%)	1. total disagreement	5%	2%	3%
	2.	10%	7%	6%
	3.	23%	30%	36%
	4.	28%	41%	37%
	5.total agreement	35%	21%	20%

The respondents were asked the following questions:
- Does the public transport company use polluting vehicles?
- Is noise pollution caused by the vehicles of the public transport company higher than that generated by the other vehicles?

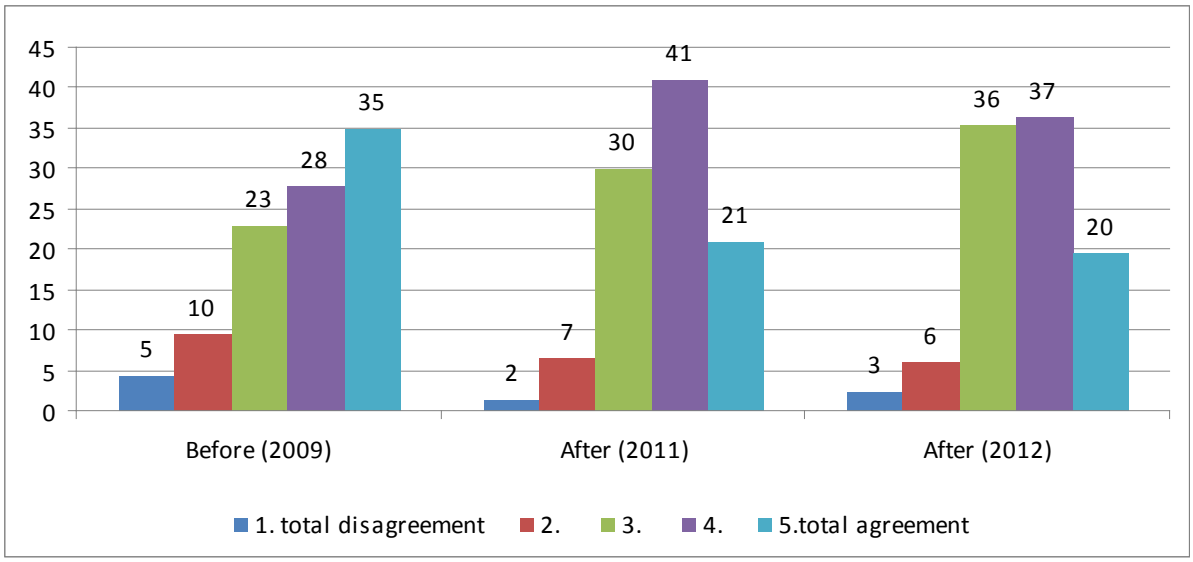


Fig. 12 Quality of service evolution (before: 2009, after: 2011, 2012)

On analysing the data from Fig. 12 we notice a decrease of the percentage of respondents who feel that air and noise pollutants generated by public transport vehicles have a major impact on them, from 63% (points 4 and 5) in 2009, to 62% in 2011 and to 57% in 2012.

- the improvement of the quality of service thanks to the introduction of environmental-friendly public transport vehicles:

Indicator		Before (2009)	After (2011)	After (2012)
15. Quality of service (%)	1. total disagreement	3%	3%	1%
	2.	5%	3%	4%
	3.	12%	11%	3%
	4.	16%	25%	27%
	5.total agreement	64%	57%	65%

The respondents were asked the following questions:
- Should the vehicles of the public transport company be replaced with new and less pollutant means of transport?
- Should vehicles of the public transport company be transformed to work on LPG?
- If LPG were used on vehicles of the public transport company instead of classic fuels, would this lead to a decrease in the level of pollution?

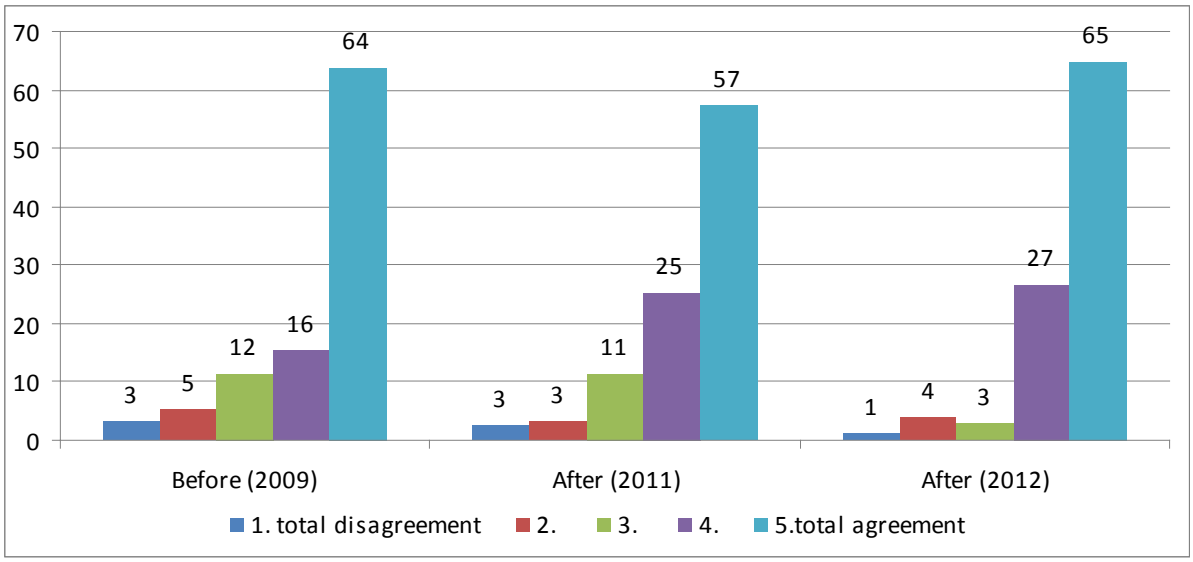


Fig. 13 Quality of service evolution (before: 2009, after: 2011, 2012)

From Fig. 13 we noticed an increase of the percentage of the respondents who believed that the introduction of eco-friendly public transport vehicles led to an improvement of the quality of public transport services, from 80% in 2009 (points 4 and 5), to 82% in 2011 and 92 % in 2012.

- peoples' perception regarding air quality in public transport stops :

Indicator		Before (2009)	After (2011)	After (2012)
15. Quality of service (%)	1. total disagreement	27%	25%	22%
	2.	23%	17%	16%
	3.	31%	36%	36%
	4.	13%	15%	18%
	5.total agreement	6%	7%	8%

Regarding the quality of service indicator, the respondents were asked the following question:
Do you think that the air quality recorded in public transport stops is good?

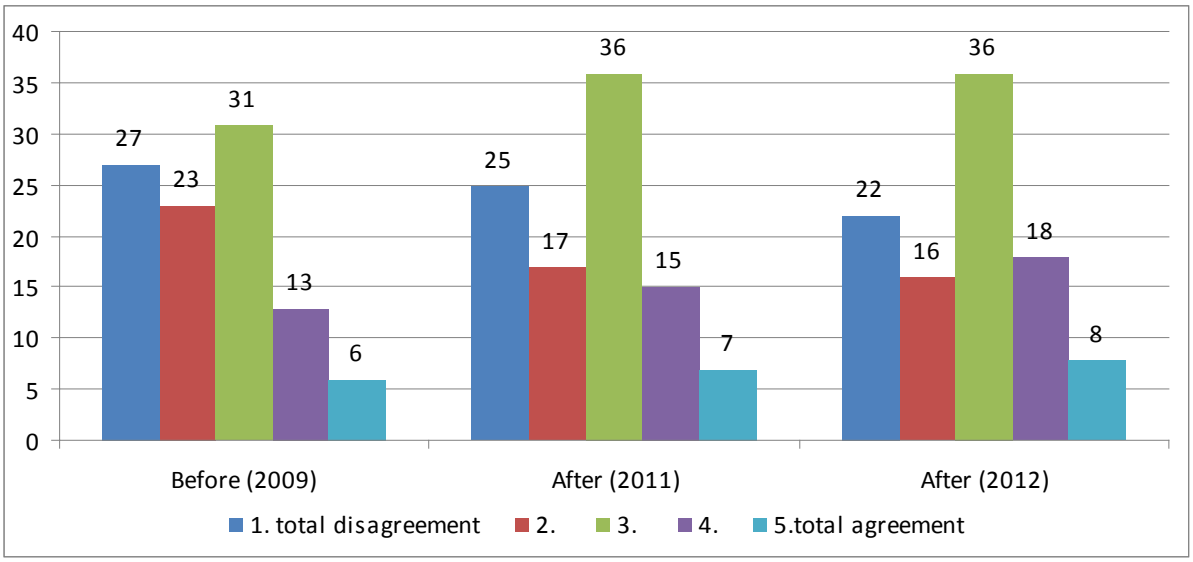


Fig. 14 Quality of service evolution (before: 2009, after: 2011, 2012)

Fig. 14 shows an increase of the percentage of respondents that perceive an improvement of air quality in public transport stops, from 19% in 2009 (points 4 and 5), to 22% in 2011 and to 26 % in 2012.

Before the CIVITAS project there were no regular survey programs to assess public perception regarding the impact public transport services have on air quality, therefore it is not possible to create a BaU scenario for these indicators.

C2.6 Cost benefit analysis

C2.6.1 Evaluation period for CBA

- Defining reference case for CBA

We are taking as reference case the do-nothing scenario (BaU scenario), where nothing is invested in the 30 buses and they continue to run on oil, which means high values of all indicators used for the measure evaluation, and unchanged dependence on classic fuels. For details see Section C1.3 – Methods for Business as Usual scenario.

- Defining lifetime of the measure

The evaluation period correspond with the remaining operating life of the LPG buses, 6 years.

- Discount rate

Following EU recommendations a discount rate of 3.5% is used for the analysis.

C2.6.2 Method and values for monetization

- Description of how the impacts are monetised

The following indicators assigned to the impact categories are used in order to analyse the impact of the measure:

Theme 1: Alternative fuels	Impacts	Evaluation category	Evaluation sub-category
	Emissions	Environment	Pollution

and clean energy-efficient vehicles	Air quality		
	Investment costs	Economy	Costs
	Maintenance costs		
	Operating costs		
	Awareness	Society	Acceptance
	Impact on health		Health

The following table presents the distribution between the stakeholders and the distribution of costs and benefits.

Agents	Costs	Benefits
Local authorities	Capital costs	
Public transport operator	Operating costs Maintenance costs Personnel training	Improved public image*
Society		Reduced emissions: NO_2, CO and PM Better air quality* Health benefits*
Public transport users		Increased quality of public transport service*

**These benefits are difficult to monetise, and therefore they have been omitted. The indicators of air quality measured along the CIVITAS corridor are also difficult to monetise because there are many factors (CIVITAS-related and not related to CIVITAS) that may influence the values, and therefore the direct impact of the conversion of the 30 buses on air quality of the corridor cannot be determined with great accuracy.*

- References of values used

The values of the indicators taken into account for the cost-benefit analysis were provided by the public transport company.

o For the emission costs generated by road transport we used:

- the emissions obtained from measurements on the same bus (Table 8):

Emissions	Before (2009)	After (2011)
CO_2 mg/Nm^3	88,325	111,256
NO_2 mg/Nm^3	138.30	88.39
PM mg /Nm^3	40.60	26.67

Table 8 – Level of emissions measured on a bus

We did not use the values recorded in 2009 (the first "after" data) because technical adjustments were made in the next period on the newly-installed LPG systems for an optimum air-fuel ratio; the LPG technology was thus adapted to the type of engine of the Renault bus.Bus drivers and maintenance workers were trained regarding the new technology.

- the values obtained from measurements were converted (Table 9) to make it possible to monetise them by means of a specific conversion factor whose value is influenced by the characteristics of the motor and by the way it is operated (cylinder capacity, engine speed, external temperature, occupancy rate, traffic and road conditions, etc.). We assume that this is a constant value (14.92) because the cylinder capacity of the motor remained constant after conversion and because the measurements were made on the same bus running on the same route.

Emissions	Before (2009)	After (2011)
CO_2	1,318,283.58 mg/km	1,660,537.31 mg/km
NO_2	2,064.18 mg/km	1,245.10 mg/km
PM	605.970 mg/km	324.701 mg/km

Table 9 – Bus emissions

- data from the Official Journal of Romania 40/20.04.2011 (Table 10)

Emission costs generated by road transport		
CO_2	0.0400	euro/kg
NO_2	0.0044	euro/g
PM	0.0870	euro/g

Table 10 – Emission costs

Emissions were monetised based on the specific costs and on the average annual mileage of a bus in both situations analysed (Tables 11 si 12):

Before

Emissions	Quantity	Price of emissions per unit	Average annual mileage per bus	Emission costs per bus
CO_2	1.318283 kg/km	0.0400 €/kg	61,500 km	3,242.978 €
NO_2	2.06418 g/km	0.0044 €/g	61,500 km	558.567 €
PM	0.60597 g/km	0.0870 €/g	61,500 km	3,242.243 €
			Total	7,043.788 €

Table 11 - Emission costs per bus (before)

After

Emissions	Quantity	Price of emissions per unit	Average annual mileage per bus	Emission costs per bus
CO_2	1.660537 kg/km	0.0400 €/kg	61,500 km	4,084.922 €
NO_2	1.2451g/km	0.0044 €/g	61,500 km	336.924 €
PM	0.324701 g/km	0.0870 €/g	61,500 km	1,737.315 €
			Total	6,159.161 €

Table 12 – Emission costs per bus (after)

By extrapolating the values above to all 30 converted buses, we obtain the total emission costs for the converted buses (Table 13):

Emission cost	**Before (Diesel oil)**	**After (LPG)**
	euro/year/fleet	
CO_2	97,289.33	122,547.65
NO_2	16,757.01	10,107.72
PM	97,267.30	52,119.46
Total *	211,313.64	184,774.83

** These values are associated to the first year of the cost-benefit analysis (CBA)*

Table 13 - Emission costs per fleet

We did not include CO in our analysis because of the very little difference between the two situations ("after" and "BaU"), which does not have a major impact in the CBA (0.003 and 0.002 €/100km, respectively).

- It was difficult to monetise the indicators of air quality measured along the CIVITAS corridor because there are many factors (CIVITAS-related and not related to CIVITAS) that may influence the values, and therefore the direct impact of the conversion of the 30 buses on air quality of the corridor cannot be determined with great accuracy.
- The values of the economical indicators used in the CBA are presented in Table 14 below:

Indicator (Year 1)	**BaU**	**After**

Capital costs	30 converted buses	0	930,000 €
	LPG station	0	79,186 €
	Personnel training	0	50,000 €
Operating costs		729,882 €	1,015,119 €
Maintenance costs		4,482 €	2,966 €

Table 14 – Indicators used in the CBA

Annual values that were monetised are updated with the annual inflation rate for energy, fuel, urban transport, railway transport, etc.

The evolution of operating costs for both scenarios (CIVITAS measure and BaU, respectively) is influenced by the annual evolution of oil price.

The estimation of the evolution of the inflation rate may not be accurate, hence the risk that the annual values of the indicators may not be accurate either. Moreover, in the case of the operating costs, there is also the risk that the fuel price may not have the evolution assumed throughout the evaluation period.

C2.6.3 Lifetime cost and benefit

Capital costs

- CIVITAS measure: capital costs are the costs of converting the buses, of purchasing and mounting the LPG filling station, and of training the staff.
- Reference case: the costs are zero because this situation corresponds to the case where no investments were made into conversion of buses, purchase of the LPG station or into personnel training.

Table C2.6.1 Capital cost in the evaluation period (not discounted)

	Cases for comparison	Cost [€]
Year 1	CIVITAS measure	504,593
	Reference case (or BAU)	0
Year 2	CIVITAS measure	504,593
	Reference case (or BAU)	0
Year 3	CIVITAS measure	50,000
	Reference case (or BAU)	0
Year 4	CIVITAS measure	0
	Reference case (or BAU)	0
Year 5	CIVITAS measure	0
	Reference case (or BAU)	0
Year 6	CIVITAS measure	0
	Reference case (or BAU)	0

Operating costs

- CIVITAS measure: these costs include fuel consumption of the LPG motor, the annual mileage for all 30 buses and the annual evolution of LPG price.
- Reference case: these costs include fuel consumption for the Diesel motor, the annual average mileage for all 30 buses, which is the same as in the “after” case, and the annual evolution of diesel price.

Table C2.6.2 Operation cost in the evaluation period (not discounted)

	Cases for comparison	Cost [€]
Year 1	CIVITAS measure	1,015,119
	Reference case (or BAU)	729,882
Year 2	CIVITAS measure	1,167,332
	Reference case (or BAU)	912,353
Year 3	CIVITAS measure	1,336,573
	Reference case (or BAU)	1,007,555
Year 4	CIVITAS measure	1,708,784
	Reference case (or BAU)	1,110,690
Year 5	CIVITAS measure	2,080,994
	Reference case (or BAU)	1,229,693
Year 6	CIVITAS measure	2,392,965
	Reference case (or BAU)	1,356,629

Maintenance costs

- CIVITAS measure: the maintenance costs result from the specific maintenance operations performed only on the LPG engine of R312 buses.
- Reference case: these costs result from specific maintenance operations performed only on the diesel engine of R312 buses.

Table C2.6.3 Maintenance cost in the evaluation period (not discounted)

	Cases for comparison	Cost [€]
Year 1	CIVITAS measure	2,966
	Reference case (or BAU)	4,482
Year 2	CIVITAS measure	3,125
	Reference case (or BAU)	4,742
Year 3	CIVITAS measure	3,337
	Reference case (or BAU)	4,994
Year 4	CIVITAS measure	3,560
	Reference case (or BAU)	5,338
Year 5	CIVITAS measure	3,794
	Reference case (or BAU)	5,690
Year 6	CIVITAS measure	4,046
	Reference case (or BAU)	6,066

Savings from reductions of environmental emissions

- CIVITAS measure: the monetised values of the emissions generated by the 30 converted buses are taken into consideration.
- Reference case: the same as above, but the emissions taken into consideration are those generated by the diesel buses.

Table C2.6.4 Savings from reductions of environmental emissions (not discounted)

	Cases for comparison	Cost [€]
Year 1	CIVITAS measure	184,775

	Reference case (or BAU)	211,314
Year 2	CIVITAS measure	195,473
	Reference case (or BAU)	223,549
Year 3	CIVITAS measure	205,873
	Reference case (or BAU)	235,441
Year 4	CIVITAS measure	220,057
	Reference case (or BAU)	251,663
Year 5	CIVITAS measure	234,581
	Reference case (or BAU)	268,273
Year 6	CIVITAS measure	250,063
	Reference case (or BAU)	285,979

C2.6.4 Compare the lifetime costs and benefits

Table C2.6.5 Lifetime cost/benefit of CIVITAS measure (discounted*)

	Capital cost	Operation cost	Maintenance cost	Emissions cost	Total cost	Total Benefit	Cumulated cost
Year 1	504,593	1,015,119	2,966	184,775	1,707,453	0	1,707,453
Year 2	487,529	1,127,857	3,019	188,863	1,807,268	0	1,807,268
Year 3	46,676	1,247,706	3,115	192,184	1,489,681	0	1,489,681
Year 4	0	1,541,225	3,211	198,479	1,742,915	0	1,742,915
Year 5	0	1,813,466	3,307	204,424	2,021,197	0	2,021,197
Year 6	0	2,014,812	3,407	210,547	2,228,766	0	2,228,766
Total	1,038,798	8,760,185	19,025	1179,272	10,997,280	0	10,997,280

(*) A discount rate of 3.5% has been used for the analysis

Table C2.6.6 Lifetime cost/benefit of the reference measure/case (discounted*)

	Capital cost	Operation cost	Maintenance cost	Emissions cost	Total cost	Total Benefit	Cumulated cost
Year 1	0	729,882	4,482	211,314	945,678	0	945,678
Year 2	0	881,500	4,581	215,989	1,102,070	0	1,102,070
Year 3	0	940,563	4,662	219,787	1,165,012	0	1,165,012
Year 4	0	1,001,779	4,814	226,986	1,233,579	0	1,233,579
Year 5	0	1,071,606	4,959	233,785	1,310,350	0	1,310,350
Year 6	0	1,142,245	5,107	240,787	1,388,139	0	1,388,139
Total	0	5,767,575	28,605	1,348,648	7,144,828	0	7,144,828

(*) A discount rate of 3.5% has been used for the analysis

C2.6.5 Summary of CBA results

The indicators in the results of the CBA analysis that allowed quantification show that there are no direct benefits if the two cases are compared.

Table C2.6.7 Lifetime cost/benefit changes (discounted)

	Changes in total cost (€)	**Changes in total benefit (€)**	**Net cash flow (€)**	**Cumulative cash flow (€)**
Year 1	788,314	26,539	-761,776	-761,776
Year 2	732,324	27,126	-705,198	-1,466,974
Year 3	352,272	27,603	-324,669	-1,791,643
Year 4	537,843	28,507	-509,336	-2,300,979

Year 5	740,208	29,361	-710,847	-3,011,826
Year 6	870,867	30,240	-840,627	-3,852,454
Total	4,021,829	169,376		

From the above-mentioned calculations, if we assume the hypotheses of the BaU scenario, the changes in NPV (€) of -3,852,454 obtained by monetising the indicators mean that using LPG is no more efficient from a strictly economic viewpoint than using diesel oil.

The benefit to cost ratio (BCR) is less than one, which means that costs are larger than benefits.

However, there are several factors which could not be quantified, and which have an impact on different categories of people. This impact can be on:

- *environment* (partially, excluding CO_2) by reduction of CO, NO_2 and PM emissions;
- *health* (on human body):
  - CO, an asphyxiating gas having a toxic effect on organisms. The asphyxiating toxic effect of carbon monoxide is due to the fact that it binds very strongly to the iron atoms in haemoglobin;
  - NO_2 is harmful to the respiratory tract and causes irritations;
  - PM has harmful effects on the human body: it causes allergies, eye irritation, inflammation of respiratory tracts. Long-time inhalation of particulate matter has carcinogenic effect;
- *society*: by changing people's mentality with respect to the environment in general and to using eco-friendly means of transport in particular.

We can conclude that this project has opened new perspectives at local level for raising the degree of responsibility towards the environment by using a complex system of measures that cover many aspects of the daily life in a city, while involving all factors bearing responsibility – from local authorities to each citizen.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1.	Conversion of 30 diesel-powered buses to run on LPG	★★
2.	Installation of an LPG distribution unit	★★
3.	Carrying out a study of emission levels	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

C4 Upscaling of results

The conversion of buses on LPG can be extended to the entire bus fleet of the public transport company and also of other operators that use buses for transport services in the Iasi metropolitan area and even in other cities. The first step in applying this measure is to demonstrate the advantages related to air pollution resulted from the implementation of the measure on the 30 buses.

The study of emission levels can be extended to all LPG-powered vehicles that have been transformed from diesel-fuelled vehicles.

The investment in the technology for the conversion of transport vehicles to work on LPG can be a serious step for the implementation of this measure at a large scale.

This measure cannot be implemented on high-capacity goods distribution vehicles.

C5 Appraisal of evaluation results

In order to assess the awareness level, the acceptance level and the quality of service surveys were conducted among the inhabitants of the city of Iasi. The interviews were carried out in the same public transport stop in all three periods. The results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a demonstration area of impact for a possible upscaling at local or metropolitan level.

As for the evaluation methods, the most difficult issue in assessing this measure was the cost-benefit analysis. Several assumptions had to be made in order to calculate the evolution of the indicators which are part of the CBA. For instance, the inflation rate can be predicted with some accuracy (it increases by 1%-2% each year), but the evolution of fuel price has variations between 25% and 30% from one year to another, which has a major impact on operating costs.

The indicators of air quality measured along the CIVITAS corridor are difficult to monetise because there are many factors (CIVITAS-related and not related to CIVITAS) that may influence the values, and therefore the direct impact of the conversion of the 30 buses on air quality of the corridor cannot be determined with great accuracy.

C6 Summary of evaluation results

After measuring air quality in 4 locations along the CIVITAS corridor, we obtained the following results:

- the CO level decreased in 3 of 4 locations in 2012, with a maximum of 14% recorded in Al. I. Cuza University area and a minimum of 4.2% in Tg. Cucului area;
- in Tudor Vladimirescu area, in 2012, the level of CO increased with 7%;
- the NO_2 level decreased in all 4 locations, in 2012, recording a maximum decrease of 8.8% in Tudor Vladimirescu area and a minimum of 6.5% in Students' Culture House;
- PM level also decreased in all 4 locations in 2012, with maximum of 13% in Tudor Vladimirescu area and a minimum of 7.2% in Al I. Cuza University area.

All measurements were compared to those from 2009.

We measured the emissions generated first by a diesel bus and then by the same bus, which was converted on LPG. The values recorded in April 2009 (before the measure's implementation) and October 2011-(second after data) were compared and the results were as follows:

- a decrease of CO emissions by 42 %;
- a decrease of NO_2 emissions by 26.5 %;
- a decrease of PM emissions by 34.02%;
- an increase of CO_2 emissions by 26%.

Surveys were conducted to assess awareness level and quality of service indicators. The results showed that:

- the awareness level increased to 45% in 2012 compared to 19% recorded in 2009;
- regarding the quality of service indicator:
  - the percentage of the respondents who declared that pollutant emissions had a major impact on them was 63% in 2009 and 57% in 2012;

- the use of environmental-friendly public means of transport led to an improvement in quality of the transport service (perceived by 80% of the respondents in 2009 and by 92% in 2012);
- air quality in public transport stops was perceived as improved (19% of the respondents thought in 2009 that it was good, and 26% in 2012).

All the changes we have made through this measure in the direction of promoting an environmentally friendly mode of transport had to be balanced by an economical compromise, i.e. the NPV calculated in CBA.

C7 Future activities relating to the measure

After the end of the project, the Municipality and of Iasi and the public transport company will keep the 30 LPG buses and the LPG station in operation.

D Process Evaluation Findings

D0 Focused measure

	0	No focused measure
1	1	Most important reason
2	2	Second most important reason
4	3	Third most important reason

D1 Deviation from the original plan

Deviation 1

The use of bio-methane, which we mentioned within DoW, was replaced with the use of LPG.

In practice the use of LPG presents a series of advantages in Iasi compared to bio-methane. The engine adapted for the LPG operation keeps most of its components for the diesel operation, and the original performances are conserved irrespective of the fuel used. LPG is much cheaper compared to biodiesel. LPG does not contain pollutant substances such as benzene, sulphur, and lead, and burns extremely efficiently, emitting few harmful gases to the atmosphere. In comparison, the bio-methane and biodiesel have disadvantages if implemented in Romania. For example, in Romania there is currently no legislation to regulate the construction of CNG (compressed natural gas) stations; as for biodiesel, its greater viscosity during cold winter can cause problems related to difficulty in pumping the fuel to the combustion chamber.

Deviation 2

We had to renounce a task, 1.7 Bio-methane Energy Supply, because a new legal situation made the implementation of this task impossible.

- The landfill in Tomesti is located within the flood plain of the River Bahlui, east of the city of Iasi, cca. 6 km away from it and south of the River Bahlui. The 153,692.13 m^2-wide land belongs to S.C. SALUBRIS Iasi, according to the Certificate of Land Ownership, series IS, no. 0248/2003. The property is 153,640,699 m^2 wide according to the measurements made in order for the land to be inscribed into the Real Estate Register.
- The current facility consists of the facility itself: 142,157,524 m^2, access road: 7,963.89 m^2, construction grounds: 3,519,285 m^2.
- Another source of financing has recently been identified within the "Environment" Sector Operational Programme, namely European funds at the level of the county master plan, by including the incomplete investments within the project of the City of Iasi into the project of the county in order to comply with the European regulations and to prevent the initiation of the infringement procedure against Romania.
- The land in Tomesti had to be transferred into the property of the county of Iasi (based on Resolution no. 291/15.09.2011 of the Local Council, on the grounds of which the land where the landfill in Tomesti lies was transferred from the public domain of the City of Iasi to the public domain for the County of Iasi) considering the granting of European funds in order to complete the investment while observing the schedule for implementing Directive no. 1999 for waste storage.
- The conclusion which is drawn based on the above-mentioned is that a biogas capturing equipment at the landfill in Tomesti cannot be purchased and mounted within the ARCHIMEDES project because:

a) The City of Iasi no longer owns the land on which the landfill in Tomesti lies (Resolution no. 291/15.09.2011 of the Local Council). The activities included in the application which

the County of Iasi is preparing in order to file it for financing within the "Environment" Sectoral Operational Programme are the closing down of the landfill in Tomesti and the development of the eco-landfill in Tutora for the transport, selective waste collection and storage throughout the County of Iasi.

b) The EU regulations stipulate that double financing be avoided for projects envisaging similar activities.

Deviation 3

Within the evaluation process, we dropped the operating revenues indicator because we realised that transforming 30 buses to work on LPG would not influence the value of this indicator at all.

Deviation 4

The study of emission levels (Task 11.1.4) according to the DoW was initially intended to be made in four locations along the CIVITAS corridor. Since the environment-related indicators that were to be measured as part of Measure IAS 22, Access Control to a Historic Centre, were similar to those of Measure 5, it was decided that the study should be made in five locations.

D2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **6. Positional**: Finding a company with know-how in converting buses on LPG was not easy.
- **11. Spatial**: A special location for mounting the LPG station as close as the bus depot was needed. The LPG station had to be installed in a place where the technical safety conditions imposed by the National Company for Control of Boilers, Hoisting and Pressure Vessels and by the General Inspectorate for Emergency Situations could be met.

Implementation phase

- **6. Positional**: The relative isolation of the measure (only one city in Romania had converted buses on LPG as part of CIVITAS II) meant difficulties that lack of experience always brings about.
- **11. Spatial:** The buses were converted in specialised workshops in the city of Ploiesti, located at 360 km from Iasi.
- **2. Institutional:** The converted buses had to be certified by the Romanian Automobile Register in Bucharest.

Operation phase

- **10. Technological**: The motors had to be fine-tuned in order to function optimally.
- **10. Technological**: LPG buses' autonomy is relatively reduced compared to diesel buses. The time spent for charging the LPG tanks is higher than the time for charging a diesel tank.

D.2.2 Drivers

Preparation phase

- **11. Spatial**: A suitable location for installing the LPG station was identified within the bus depot.

Implementation phase

- **1. Political/strategic**: The conversion of the buses was meant to offer cleaner transport within the city, as part of the overall trend towards sustainable mobility and pollution reduction in the city.
- **8. Organizational**: The period assigned to the conversion of the buses had to be as short as possible.

Operation phase

- **9. Financial**: Operation and maintenance costs are lower than with diesel-powered buses.
- **8. Organizational**: Finding an optimal time interval for fuelling the buses, preferable during off-peak hours.

D.2.3 Activities

Preparation phase

- **11. Spatial**: The location which was identified within the bus depot was prepared in order for the LPG station to be installed. Some overhead power lines had to be moved in order to install the LPG station in the selected location.

Implementation phase

- **8. Organizational**: The buses were grouped when they travelled from Iasi to Ploiesti (the place where they were transformed) and then to Bucharest for the certifying process and back to Iasi.
- **8. Organizational**: The drivers of the transport company were instructed about operating the converted buses and the maintenance personnel were trained accordingly.

Operation phase

- **10. Technological**: The operating parameters of the buses were collected and analysed, and the motors were adjusted for optimal performance.
- **8. Organisational**: Fuelling LPG buses at off-peak hours.
- **12. Other**: Special efforts are made to keep converted buses in operation with as short interruptions as possible.

D3 Participation

D3.1 Measure Partners

- **The Municipality of Iasi (Leading role)**
  - Data sheet elaboration for LPG station.
  - Data sheet elaboration for transformation of 30 buses.
  - The tender organization for the LPG station and for the conversion of 30 buses.
  - Signing the contracts with supplying companies.
  - Campaign to demonstrate the impact of alternative fuels.
- **Public transport company (Principal participant)**
  - In charge of providing 30 buses and the location for the LPG station.
  - Cooperation with supplying companies to implement measure's tasks.

- Operating 30 LPG buses and LPG station with specialised personnel.
- Involvement in campaigns.

- **The companies that supplied the equipments (Principle participants)**
  - Supplying and installing the equipments for the transformation of 30 buses.
  - Supplying and installing the LPG station.
- **Technical University of Iasi (Occasional participant)**
  - Study of emission level of buses before and after the implementation of the measure.
  - Organising surveys in the proximity of the CIVITAS corridor to demonstrate the impacts of the measure.
  - Participated in campaigns.
- **The companies that measured air quality and bus emissions (Occasional participants)**: Measuring air quality level in four locations along the CIVITAS corridor and emissions generated by a diesel bus and an LPG bus.
- **Administrative Structures (Occasional participant)**: a national institute that verified the LPG station, certified its technical project and approved its operation, and another institute certified the buses after the conversion process.

D.3.2 Stakeholders

- **Citizens:** less polluted city due to a reduction of pollutant emissions leads to increase of human health;
- **NGOs**: organizations that support environmental preservation activities.
- **Iasi**: improvement of the city's image by introducing some eco-friendly transport vehicles.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Transferability.** This measure can be replicated in other cities because diesel motors can theoretically be converted to run on LPG, and the converted buses can be fuelled from an already existing filling station or from an LPG station installed especially for this purpose.
- **Main barrier and possible solutions.** The main obstacle in replicating the measure is investment costs. Therefore it is advisable that the company that converts the buses is located at least in the same country, so that transport costs are reduced or almost eliminated. Moreover, it is recommended that the municipality and even NGOs get involved in the implementation of such a measure.
- **Age of the buses.** For optimising results, it would be recommended that the diesel buses that are intended to be converted are not very old.

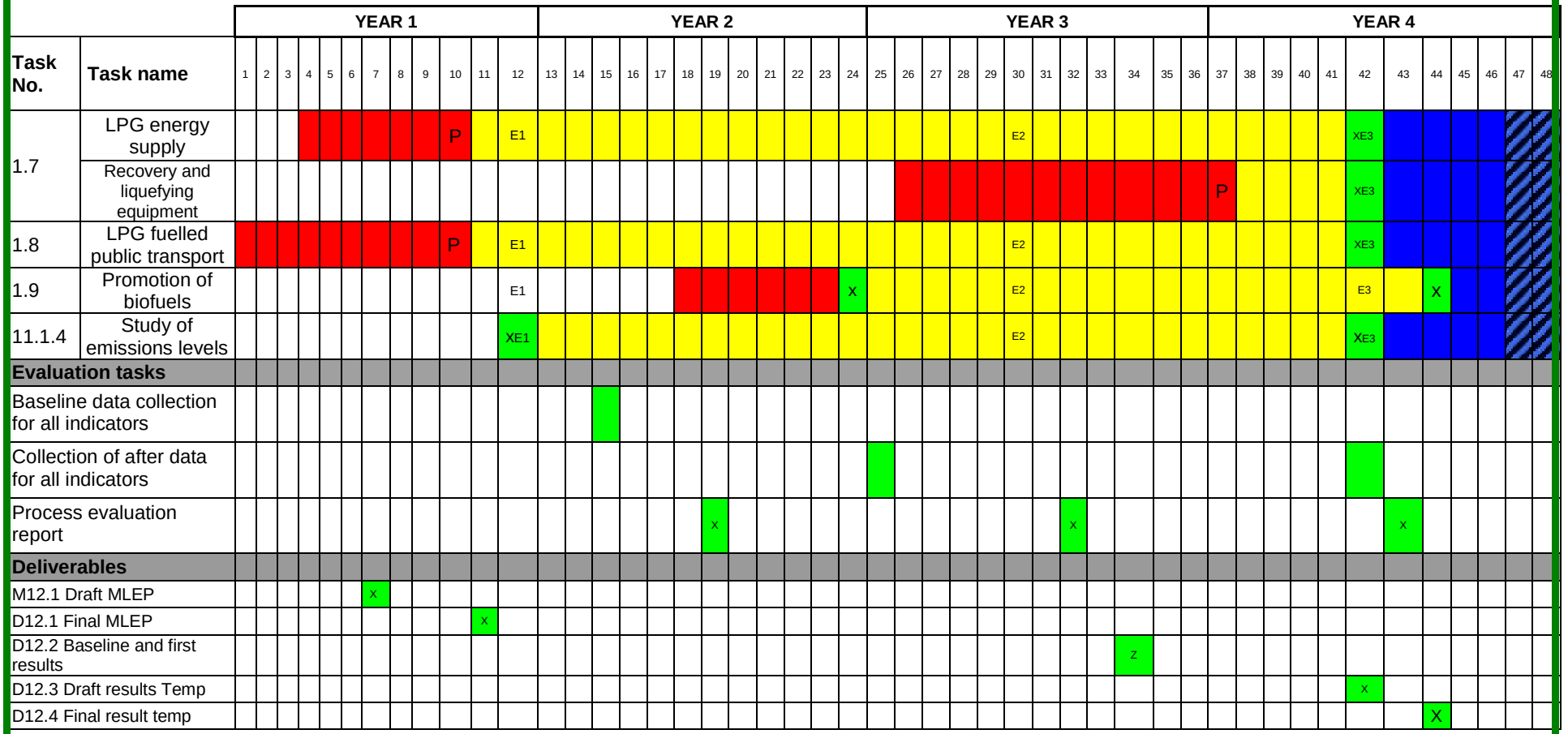
D4.2 Recommendations: process (related to barrier-, driver- and action fields)

- **Stakeholders' involvement.** The good collaboration between the provider of equipment and the public transport operator is essential during each phase of such a project, because the new technology should be implemented while taking into account the requirements of the transport company, specific to the particular conditions of operation.

- **Training** – the team that will take care of the converted buses must be very well prepared so that they can solve any problems that may appear in as little time as possible. The drivers of these buses should also be trained to operate these buses properly.

Measure title:	**LPG Buses**				
City:	**IASI**	*Project:*	**ARCHIMEDES**	*Measure number:*	**5**

E Summary time schedule



ANNEX 1

Description of the Study of Emission Levels

Air quality was measured by a specialised company in 4 locations on the CIVITAS corridor in November 2009. The measurements were made in bus stops using authorised devices. All air quality measurements were made in bus stops along the CIVITAS corridor in one day. Six samples were collected for each emission type (CO, NO_2 and PM), three during the day and three during the night, and the results that were used in the evaluation process were their arithmetic mean for each type of emission.

Air quality measurements were performed at a height of 1.5 metres from the ground using the following devices:
- automatic analyzer PHOCHECK 5000 Ex for NO_2
- automatic analyzer DRÄGER X-am 7000 for CO
- automatic analyzer MICRODUST PRO for particulate matter.

The measurements were made during two time intervals: 12.00-14.30 and 23.00-0.45. The mean value of the emissions and the *amplitude*[1] were then calculated for each location and each time interval, and graphics were drawn. The data were then compared to the threshold limit values.

The data collected was grouped according to emission type, and then according to the place of measurement. The mean value was calculated by time interval.

- **NO_2**

The mean value and the amplitude of NO_2 are presented in Table 1, and the graphical representation of the mean values can be found in Figure A1.

Table 1. NO_2 - mean values and amplitude of the values measured

	Place of measurement	Time interval of measurements			
		12.00-14.30		23.00-0.45	
		Mean (mg/m^3)	Amplitude (mg/m^3)	Mean (mg/m^3)	Amplitude (mg/m^3)
1	Tudor Vladimirescu (bus stop)	2.49	0.54	1.80	0.52
2	Tg. Cucului (Golia monastery - bus stop)	2.11	0.18	1.84	0.25
3	Students' Culture House (bus stop)	2.93	0.375	2.07	0.15
4	Al. I. Cuza University (bus stop)	2.25	0.97	1.30	0.25
5	Cuza Vodă (post office – tram stop)	1.34	0.085	1.11	0.605

[1] Amplitude in this context is defined as the difference between the maximum and the minimum values measured, so it provides an indication on the uncertainty or variability of the measurements.

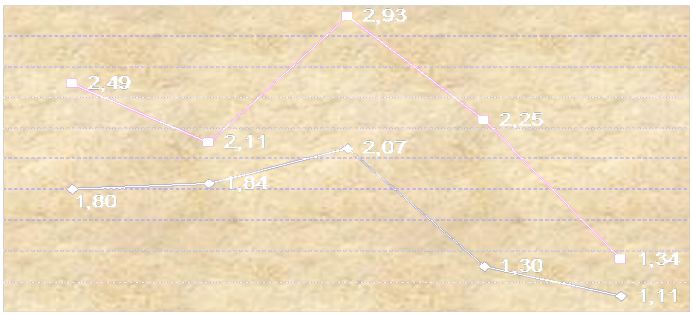


Fig. A1. Mean values of NO_2 (mg/m^3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia monastery – bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University (bus stop); 5 - Cuza Vodă (post office – tram stop)

The values of the concentration of NO_2 during daytime are much higher than those during night and they are higher at the bus stops compared to the tram stop. During the day, the highest values are to be found in the areas with busy traffic (Students' Culture House – 2.93 mg/m^3 and Tudor Vladimirescu – 2.49 mg/m^3). The smallest difference between the NO_2 values measured during the day and those measured during the night is in Tg. Cucului (2.11 mg/m^3 compared to 1.84 mg/m^3), which is located in a busy area of the city centre. The biggest difference is at the bus stop at the Al. I. Cuza University, where the level of concentration during the night is of 1.3 mg/m^3, which is very close to the values measured in the tram stop – 1.11 mg/m^3.

All mean values of the NO_2 concentration measured during the day at the bus stops ***exceed*** the threshold limit value (TLV) of 0.2 mg/m^3 set by Ordinance 592/2002. In the area of the Students' Culture House the TLV is exceeded also during the night.

When analysing the dispersion of the values, we conclude that the highest fluctuations in NO_2 concentration during the day are at the bus stop in front of the Al. I. Cuza University (the amplitude is 0.97 $mg.m^3$), while the smallest fluctuations are in the tram stop on Cuza Voda street (the amplitude is 0.085 mg/m^3). The highest fluctuations during the night are in the tram stop (0.605 mg/mc^3 amplitude) and at the bus stop on Tudor Vladimirescu street (0.52 mg/m^3 amplitude, similar to the amplitude during the day).

- **CO**

The mean value and the amplitude of CO are presented in Table 2, and the graphical representation of the mean values is to be found in Fig. A2.

Table 2. CO - mean values and amplitude of the values measured

	Place of measurement	Time interval of measurements			
		12.00-14.30		23.00-0.45	
		Mean (mg/m^3)	Amplitude (mg/m^3)	Mean (mg/m^3)	Amplitude (mg/m^3)
1	Tudor Vladimirescu (bus stop)	1,667	0,15	1,267	0,15
2	Tg. Cucului (Golia monastery - bus stop)	2,067	0,15	1,533	0,3
3	Students' Culture House (bus stop)	2,067	0,25	1,267	0,15
4	Al. I. Cuza University (bus stop)	1,900	0,3	1,367	0,2
5	Cuza Vodă (post office – tram stop)	1,333	0,15	0,797	0,555

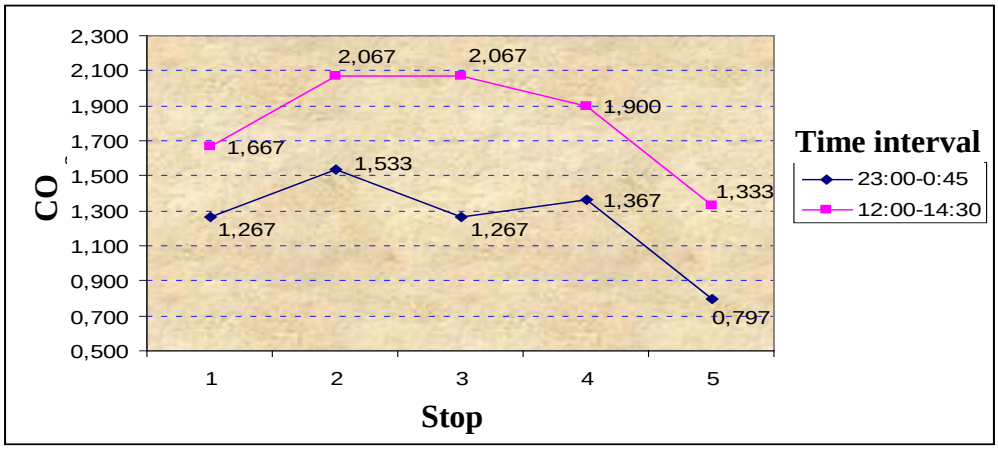


Fig. A2. Mean values of CO (mg/m^3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia monastery – bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University (bus stop); 5 - Cuza Vodă (post office – tram stop)

The values of CO concentration during daytime are much higher than those during night and they are higher at the bus stops compared to the tram stop. During the day, the highest values are in the central areas (the bus stops in Tg. Cucului and in the area of the Students' Culture House – the mean value is 2.067 mg/m^3). The lowest value that has been measured is in the tram stop on Cuza Vodă Street – the mean value is 1.333 mg/m^3. The mean value of CO concentration in the tram stop during the night is almost half the daytime value – 0.797 mg/m^3 – and at the bus stops varies around the mean values measured in the tram stop during daytime: 1.267-1.533 mg/m^3.

The fluctuations in CO concentration are much smaller (the amplitudes vary between 0.15 and 0.3 mg/m^3) except the values measured in the tram stop during the night, where the amplitude is 0.555 mg/m^3.

All values are ***below*** the threshold limit value of 10 mg/m^3.

- **Particulate matter**

The mean value and the amplitude of particulate matter are presented in Table 3, and the graphical representation of the mean values is to be found in Fig. A3. The measurements were made only in bus stops.

Table 3. Particulate matter - mean values and amplitude of the values measured

	Place of measurement	Time interval of measurements			
		12.00-14.30		23.00-0.45	
		Mean	Amplitude	Mean	Amplitude
1	Tudor Vladimirescu (bus stop)	0.239	0.1300	0.082	0.0100
2	Tg. Cucului (Golia monastery - bus stop)	0.306	0.1075	0.130	0.0100
3	Students' Culture House (bus stop)	0.259	0.0880	0.100	0.0095
4	Al. I. Cuza University (bus stop)	0.305	0.1765	0.109	0.0120

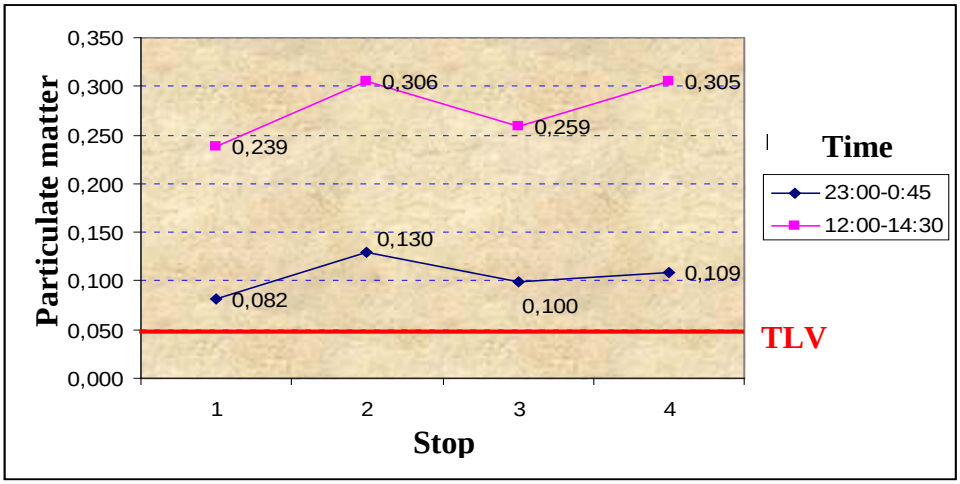


Fig. A3. Mean values of particulate matter (mg/m^3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia monastery - bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University

The mean values of the concentration of particulate matter ***exceed*** the threshold limit value (0.05 mg/m^3) both during the day (from 4.8 to 6.1 times higher) and during the night (from 1.6 to 2.6 times higher). The highest mean values of particulate matter, both during daytime and during the night were recorded in Tg. Cucului and Al. I. Cuza University stops (0.305 and 0.109 mg/m^3, respectively). The maximum value measured at the bus stop in front of the university is 10.2 times higher (0.511 mg/m^3) than the TLV.

The fluctuations of the values are more than 10 times higher during the day (e.g. the amplitude in the Al. I. Cuza University stop is 0.1765 mg/m^3) than those during the night (0.012 mg/m^3 in the same stop). The lowest fluctuations are in the stop Students' Culture House (the amplitude is 0.088 mg/m^3 during the day and 0.0095).

ANNEX 2

Technical details of the changes made at the 30 Renault R312 buses

The most important changes were performed on the *engine*. To transform this equipment, the piston geometry was modified; this is totally different from the diesel engine in order to obtain an optimal compression ratio for LPG-powered engine operation. These piston changes consist in reducing its height by changing its chamber, but also in reducing the diameter to cope with temperature stresses.

Another important change was made to the cylinder heads. The valves and valve seats were replaced with alternative ones, made from harder material in order to cope with temperature stresses. Rings were mounted on the valve guides to prevent absorption of oil vapours in the inlet manifold, avoiding increased oil consumption during operation.

Also, a major change was performed on *diesel injectors*, these being replaced by spark plugs (Fig.A4). The spark plugs were installed in the appropriate places in order to ignite the fuel mixture in the chamber, without changing its shape.

Fig. A4 Renault R312 LPG engine

The *injection pump* was replaced by a system to count the total number of engines revolutions. Within the original diesel engine's compressed air admission system, a carburetor was mounted to ensure the required fuel mixture. This system consists of throttle, air-gas mix installation and TPS sensor (throttle position sensor).

The LPG fuel feeding equipment also required the installation of an additional electronic system. This additional electronic system interconnects a special computer to command, signal and control the new fuelling system. This computer controls all engine parameters, receiving information from sensors (TPS, Lambda probe, temperature sensor, speed sensor) and acts immediately to ensure appropriate functioning: ignition, optimum fuel mixture etc. Therefore, the intervention of the computer protects the engine from overheating, over speed, wrong fuel mixture operation, or other circumstances that could damage its whole function.

Structural changes were performed on the *vehicle body* to enable the installation of LPG tanks. These four tanks have been mounted under the flour of the bus, in positions that would ensure their security in case of an accident, above the lowest point of the bus, so it cannot be hit from below. The LPG tanks (Fig. A5) were mounted on metal supports, allowing easy intervention. The installation of the four tanks was made symmetrically to the body axis, without changing the centre of gravity of the vehicle.

Fig. A5 LPG storage tanks mounted on the bus

The capacity of each tank is 80 litres, but for security reasons, its filling is automatically limited to 80% of its maximum capacity. Thus, the four tanks reach a total capacity of 256 litres. This LPG quantity provides a range of 320 – 400 km within the urban area, enough for a day's operation.

The filling of the fuel tanks and LPG fuel supply to the engine is via copper pipes, protected by a plastic cover. These pipes are attached to the body using metal clamps, positioned so as to prevent their deterioration in normal conditions.

The transformation of LPG fuel from liquid to gas, as well as providing engine's proper pressure, is made through two reducing-evaporators, mounted within engine compartment. The energy necessary for performing these operations (transformation of liquid to gas and assuring the proper pressure) is provided by heat recovered from the engine's cooling system.

Plant safety is ensured by several mechanical, electrical and electronic systems. A system of valves, mounted on the LPG tanks, ensures their safety in case of crash, fire, accidental discharge and overpressure. The electronic valves mounted on the tanks, the LPG pipes and those two reducing-evaporators can mechanically stop the gas, in case the computer does not follow the command. In this case, if the engine stops, either intentionally or accidentally, for example if the driver opens the key contact of the vehicle, the electric feeding of the solenoids also stops.

ANNEX 3

LPG filling station technical data.

The components of the "LPG filling station type SKID (monobloc) for vehicles" are:
- 2 storage containers having a capacity of 4.850 litres, equipped with couplings, measurement and control devices and safety fittings;
- relief valves;
- electrical engine;
- multistage centrifugal pump;
- double display dispensers with two pistols;
- exhaust, delivery, circulating, by-pass and return pipe for the fume phase;
- emergency shutdown system;
- electrical board;
- compressor.

The SKID monobloc installation, produced by DELTAGAZ in the Czech Republic was mounted on a fixed metal frame with large screws, in a concrete foundation of 4,60 m x 6,00 m, with a height of 0,15 m.

Each container is equipped with a spring safety valve produced by SAMTECH Italy and set to open in the atmosphere in order to exclude the possibility of an increase in internal pressure by more than 10% in comparison with the maximum admissible working pressure.

For the LPG supply of the vehicles we considered a multistage centrifugal pump produced by POMPETRAVAINI S.P.A. Italy, type TBH 306/1-R/GP, driven by an electrical engine, type ASA 112M-2, manufactured by UMEB SA Bucuresti.

The centrifugal pump is supplied by means of an underground cable from an electrical control panel which is conveniently located outside the explosive environment, on an exterior wall of the operator's cabin. The centrifugal pump is controlled with the help of a push button on the LPG distributor.

The differential pressure valve is set at 10 bars to protect the pump and the other equipment if pressure in the pump increases too much.

The flow limiter automatically blocks the exit of the gas from the storage container in the event of uncontrolled losses of LPG.

The fast stop valves for emergency cases enable the closing of the exhaust and return line of the centrifugal pump and, if the station is not functional, or in emergency cases, they are actuated hydraulically, from the distance, through the activation of the emergency stop button.

The double display dispenser, produced by PETROLMECCANICA, Italy, type LPG6000BP, was mounted on a concrete foundation of 3.00 m x 3.00 m x 0.15 m.

The electrical panel was mounted and it was equipped with LED's of various colours, which ensure the optical signalling of the start-up and of the shut-down of the centrifugal pump.

The compressor, model YALCO, ensures the starting up and shutting down of the pneumatic valves. It was mounted in a room designed for this purpose.

ANNEX 4

Press reactions.

http://www.iasiplus.ro/news/5/13418/Pe+scurt.html

Fig. A6 Inauguration of the first converted bus

http://www.ziaruldeiasi.ro/local/apar-primele-autobuze-cu-instalatii-gpl~ni5eb2

Fig. A7 Article about the implementation of the measure

ANNEX 5

Questionnaire – before situation

M5 - LPG Buses

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.
5. When I go by public means of transport, I prefer to use a:

□ one-trip ticket □ two-trip ticket
□ set of 10 trips □ monthly season ticket

6. How often do you use public transportation? (How many times a week / a month / occasionally ...)

_____

7. The public transport company uses the following fuels:

□ Gasoline □ Diesel oil
□ Electricity □ Bio-methanol
□ other fuels

8. The least polluting car fuel is _____.

9. Are there any public means of transport in Iasi using LPG (liquefied petroleum gas)?

□ yes □ no □ I don't know

10. Can buses belonging to the public transport company be easily converted to run on LPG?

□ yes □ no □ I don't know

11. Does the city of Iasi participate in the CIVITAS project, which is partially funded by the European Union?

□ yes □ no □ I don't know

12. Will the public transport company, as part of the CIVITAS project, convert 30 buses so as to run on LPG instead of diesel and will it install an LPG filling station for fuelling these buses?

□ yes □ no □ I don't know

13. Do you consider the introduction of the 30 buses mentioned above will have a real impact on the environment?

□ yes □ no □ I don't know

14. Does the public transport company plan to introduce more vehicles that use alternative fuels?

□ yes □ no □ I don't know

15. Do you know the benefits of replacing classic fuels with LPG?

List at least one of these benefits _____.

16. Vehicles used for transportation pollute the environment, but this is not the only cause of pollution in our city. Please rank the following factors, depending on their contribution to increasing the levels of pollution in Iasi (the factor that pollute the most, in your opinion, will be placed first)

People from Iasi that use their personal car intensively	
Industry, factories in Iasi	
Public transport	
Vehicles used for distribution and transport of goods	
Motor vehicles for the transport of persons (except for those of the public transport company in Iasi)	

17. To what extent do you agree with the following statements (within a scale from 1 to 5, where 1 has the meaning "total disagreement" and 5 "total agreement")

Does the public transport company use polluting vehicles?	1 2 3 4 5
Should the vehicles of the public transport company be replaced with new and less pollutant means of transport?	1 2 3 4 5
Should vehicles of the public transport company be transformed to work on LPG?	1 2 3 4 5
Is noise pollution caused by the vehicles of the public transport company higher than that generated by the other vehicles?	1 2 3 4 5
Do vehicles of the public transport company have a high contribution to the city's entire pollution level?	1 2 3 4 5
If LPG were used on vehicles of the public transport company instead of classic fuels, would this lead to a decreased level of pollution?	1 2 3 4 5
Do you think that the air quality recorded in public transport stops is good?	1 2 3 4 5

18. How satisfied are you by the services of the public transport company on the whole, with a grade from 1 to 10? _____.

Thank you!

Executive summary

This measure was conceived from the beginning to facilitate the access of young Romany people living in the village of Ciurea to educational institutions in Iasi. Actually all the inhabitants of the village benefit from the advantages of this measure. The provision of a constant, regular and qualitative link between the village and the city's educational institutions has a significant social impact.

Another reason for conceiving this measure was the high level of citizens' discontent regarding the quality of the transport services offered by the private transport company who was operating the line which linked Ciurea to Iasi before the implementation of this measure. They addressed many complaints to the local authority asking to replace the transport operator.

The discussions between Ciurea local authority, the Municipality of Iasi and the public transport company led to the decision of creating a new bus line to link the village of Ciurea to most of the city's schools and universities.

Campaigns were held to inform citizens about the new bus line, frequency of buses, stops along the route, etc.

In order to assess the impact of the measure the following methods were used:

- Surveys were conducted among the inhabitants of Ciurea with the following results:
  - 70% of the respondents were not satisfied with the transport services of the private operator in 2008 (vehicles' frequency, travel times, comfort, etc.). After the new bus route was created, the satisfaction degree of passengers raised to 78% in 2009 and to 83% in 2011. The reason of these high percentages is a result of the considerable improvement of transport conditions once the operator has changed: the timetable was observed, the vehicle frequency and the transport capacity were adapted to the needs of passengers, the comfort has improved, the bus route was extended so that the inhabitants of Ciurea could reach the most important institutions in the city of Iasi without changing means of transport;.
  - 80% of the interviewees regarded low-capacity vehicles (minibuses) as inappropriate for public transport in 2008. After the measure was implemented, the percentage of the respondents who thought that the large-capacity vehicles on the new bus line encourage the use of public transport instead of private cars raised from 70% in 2009 to 74% in 2011.
- The passengers living in Ciurea who use this new bus line were counted. The results showed that the number of Ciurea inhabitants who travelled in a month by the new bus line increased constantly each year: from 60,480 in 2008 (BaU scenario) to 108,864 in 2009, and to 128,520 in 2011.

The following can be regarded as lessons that were learned during the implementation of this measure:
- the transport capacity has to be adapted to citizens' needs in order to provide quality transport services;
- the prices of tickets should be set according to the distance from the city; inside the city the normal fares should apply.

From the perspective of the impact of the measure, we can state that the positive evolution of the awareness and acceptance level indicators, as well as the high number of Ciurea inhabitants travelling on this route have created the premises of implementing similar measures in other villages in the metropolitan area of Iasi. This measure has had a strong social impact on Ciurea inhabitants because they were offered quality transport services: high-capacity vehicles, transport timetable that is observed, route extended into the city centre and beyond.

IAS 11 - New School Bus Link

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To increase the educational level of the Romany community.

(B) Strategic level:

- To extend the public transport services to the entire metropolitan area.

(C) Measure level:

- To create a new bus line to link Ciurea to Iasi in order to facilitate the access of young people – belonging to both the Romanian and the Romany ethnic groups – to the educational and cultural establishments of the city, and in order to provide other inhabitants of the village a comfortable way to move between home and their workplaces in the city.
- To encourage all the inhabitants of Ciurea to use public transport.

A1.2 Target groups

The target group is represented by all the inhabitants of Ciurea, which has a total population of 12,500, about 2400 of which are Romany. About 10% of the total population living in Ciurea represents school and university students.

Another target group is represented by the citizens living in the villages of the Iasi Metropolitan Area, who can help persuade the local authorities to sign association agreements with the Iasi City Hall to create bus lines like the one linking Ciurea to Iasi.

A2 Description

In the past, the village of Ciurea and the city of Iasi were linked by minibuses, which had a low transport capacity in relation to the number of citizens. Furthermore, the time schedule of the minibuses did not met transport requirements.

To answer the citizens' needs, the local authorities of Iasi and Ciurea created a bus line to link the village to social centres of the city (educational establishments, public institutions, etc.). The public transport company operates on this line with buses. The high capacity of buses (about 100 persons) in contrast with that of minibuses meets the comfort needs of Ciurea inhabitants. Another positive aspect of this line is that the public transport company respects the timetable, which the private operator did not. Moreover, the bus line is much longer (around 27 km) than the former minibus line. The duration of a round trip is of 80 minutes.

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New mode of transport exploited** – the transport link between the village of Ciurea and the city of Iasi was provided by a private operator, but because the quality of transport services was poor (lack of timetable, low number of vehicles, crowded vehicles, etc.), people started to complain. In this context, the public transport company proposed and established a new bus line.
- **Targeting specific user groups** – the target group is the Romany population, especially the school and university students.
- **New economic instrument** – by creating bus links with the villages from the metropolitan area, Ciurea in our case, the number of passengers that use public transport will increase.
- **New policy instrument** – more and more citizens from the city are building houses in the villages of the metropolitan area. This is yet another reason for linking villages to the city through public transport,

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

The link between Ciurea and Iasi was provided by a private transport operator. Since we have no data from private transport operators, we estimate that 4 minibuses per hour transported citizens to the city. Because the transport demand was higher than the legal capacity of minibuses, we assumed that each minibus carried on a round trip around 60 persons. The main problem claimed by the passengers was the poor quality of the transport services (lack of timetable, low number of vehicles, crowded minibuses, etc.).

B4 Actual implementation of the measure

Stage 1: Discussions with parties involved (October 2008) – Based on the complaints of Ciurea citizens, discussions were held between the Municipality of Iasi and the public transport company regarding the introduction of a new transport line, and the design of informative and promotion actions.

Stage 2: Creation of the new bus line (October 2008 – January 2009) – the Municipality of Iasi created a new transport connection by introducing bus line 41b between Ciurea and Iasi (Fig.1.)

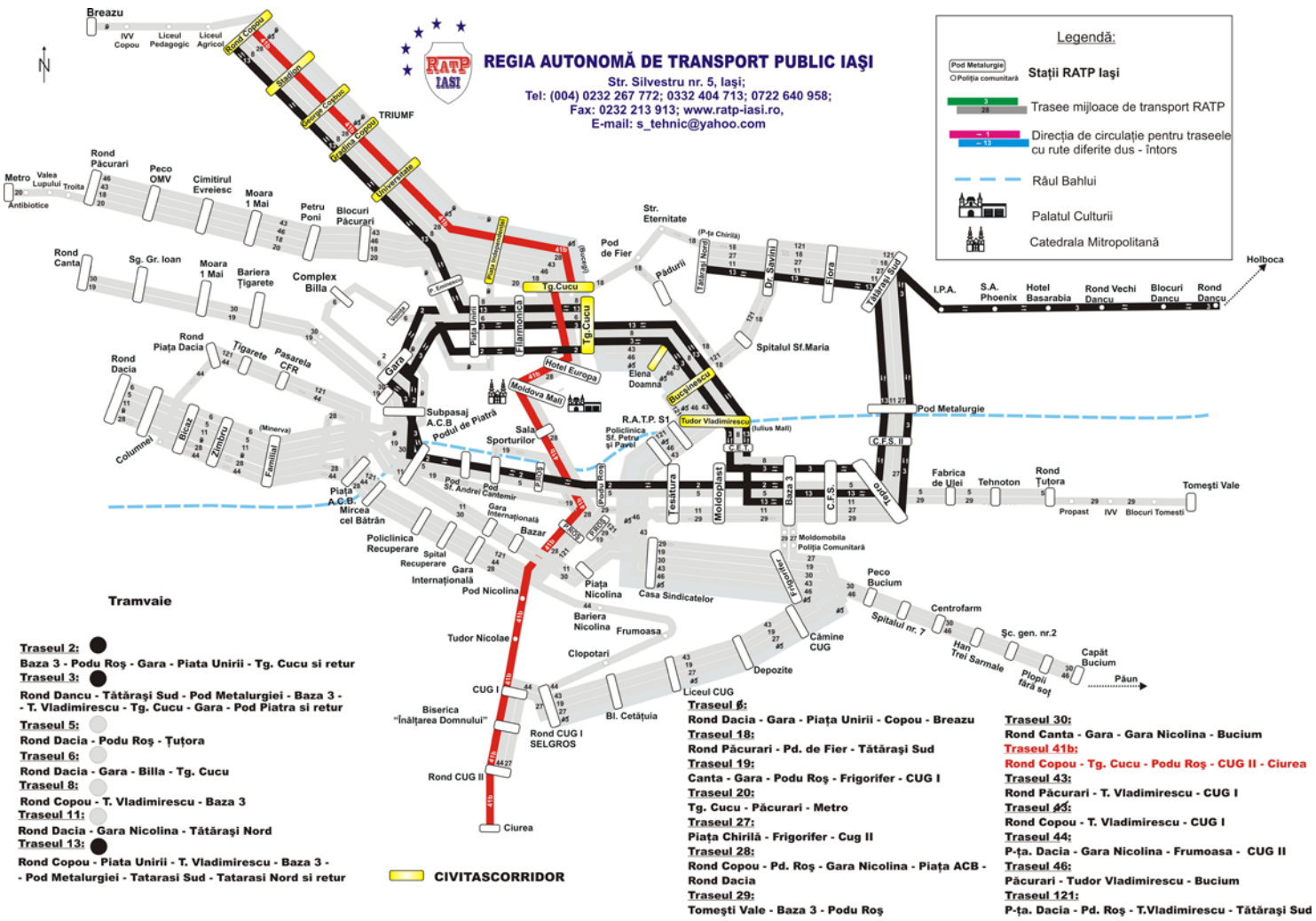


Fig.1 Map of the public transport company's lines showing the newly-created bus line (marked with red)

Stage 3: Promotion actions (November 2008 – January 2009) – After the buses of the public transport company started to run on the new bus line, people were informed about this line (number and frequency of buses, journey time) through map guides, local radio stations and ticket kiosks.

Stage 4: Collection of data – In January 2009, March 2010 and February 2011 data regarding the number of passengers was collected for evaluation. Within the same periods, interviews were conducted to evaluate the awareness and the acceptance level of people with respect to this measure.

The Ciurea village is under County Council administration. The Municipality of Iasi created a new transportation connection by introducing bus line 41b, which connects the two localities and thus ensures the transportation of the inhabitants of Ciurea to schools, universities, public and cultural institutions in Iasi.

This bus line was created on the basis of the association agreement between the city of Iasi and the Ciurea village, and of Act No. 268/2008 of the County Council. Based on the association agreement, a protocol between the Ciurea village and the public transport company of Iasi for the creation of bus line 41b was signed.

Bus line 41b is an extension of line 41, the route of which is Copou – Piata Eminescu – Tg. Cucu – Podu Ros – Rond CUG. This extension (Rond CUG - Ciurea) links Ciurea to the boundary of the city of Iasi. The new line satisfies the transport needs of the inhabitants of Ciurea towards most of the educational, cultural and public institutions in Iasi, as it crosses the centre of the city and it also reaches the university area.

The categories which benefit from free or partially grant-aided transport according to the law or to decisions of the Local Council of Ciurea are specified in the above-mentioned protocol: war veterans, widows of war veterans, deportee or refugees from political persecution, martyrs or fighters in the 1989 Revolution, disabled persons and their personal assistants, school and university students, and pensioners.

The transport company and the village of Ciurea concluded a collaboration contract regarding the issue of special season tickets for the students living in Ciurea in order to help them and encourage them to use public transport.

The statistics of the village of Ciurea show that 9 out of 10 potential Romany passengers use the public transport facilities of line 41b each round trip.

The route of this bus line is: Copou – Targu Cucu – Podu Ros – Rond CUG – Ciurea (Fig. 2)
- the journey time is about 80 minutes for a round trip;
- the frequency of the buses on this route is 4 buses per hour;
- the average passenger number on a round trip is about 170, from which 85 are from Ciurea.

Fig. 2 Bus operating on line 41b

Prior to the introduction of line 41b, the people from Ciurea were growing more and more dissatisfied with private transport services because of issues related to the capacity of vehicles and to the timetable. After the public transport company had created bus line 41b, which links the village to the centre of the city, people were informed about this line, the frequency and travel time, the number of buses, through map guides, local radio stations and information available at ticket kiosks.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure IAS 12 - Improved ticketing** – vending ticket machines are placed along Civitas corridor and cover part of the route that connects Iasi to Ciurea.
- **Measure IAS 13 - Video surveillance system** – all buses operating on the new line have surveillance cameras
- **Measure IAS 76 - Bus management system** – all buses operating on the new lineare monitored through a fleet management software.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

The selection of this measure for the ARCHIMEDES project was straightforward. We took into consideration two things: the great number of complaints from inhabitants of Ciurea regarding the lack of professionalism of the private transport operator that was operating a minibus line at that time (too few means of transport, too low transport capacity – minibuses that have only 18 sitting places and an irregular transport schedule), and the great number of Romany people with many children who needed to go to schools and universities. Therefore, the main impact of this measure is on social level. The Romany population of Ciurea (but also the rest of the village inhabitants) benefit from an accurate transport schedule, from higher transport capacity (because buses replaced the private operator's minibuses), and from higher accessibility to the city.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	survey	Index (%),
14			Acceptance	Acceptance level	survey	Index (%),
	TRANSPORT					
28			Vehicle Occupancy	Average occupancy	counting	Average Persons / vehicle

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
13	Awareness level	Increased	A survey was conducted to assess these indicators. The interviews* were carried out by students in the proximity of a public transport stop in Ciurea for five working days after the measure implementation. 100 people were interviewed in each stage (see section C.1.2 for details). Some details on the survey campaign are given below. **January 2009, March 2010 and February 2011.** For the assessment of the awareness level, people were asked if the transport services between the village of Ciurea and the city of Iasi must be provided by high capacity transport vehicles; and if bus line 41b created through the ARCHIMEDES project encouraged people to use public transport services instead of private cars. For the evaluation of the acceptance level indicator, the respondents were asked if they were satisfied about the frequency of public means of transport, travel times and transport conditions provided through bus line 41b.	After - January 2009, March 2010 and February 2011
14	Acceptance level	Increased		
28	Average occupancy	Increased	People using this route are counted in the morning as well as in the afternoon, thus resulting an average value of passengers/trip/day	

* The questionnaire is to be found in Annex 1.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Collection of after data	13, 14	M5, M19, M30	TUI
	28	M5, M19, M30	PTI
D12.2 Baseline and first results from data collection	All indicators	Month 39	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

Before this measure was implemented, the inhabitants of Ciurea travelled using taxis, personal cars or the minibuses of a private operator.

We are taking 2008 as reference year, when the public transport between Ciurea and Iasi was provided by the minibuses of a private operator.

For the assessment of the measure the evolution of the following indicators was analysed:

- The awareness and the acceptance level indicators were determined by means of surveys among the inhabitants of Ciurea.

  Since there was no data available on these indicators for the situation prior to the implementation of the measure, the survey conducted in 2009, after the measure was implemented, included questions on the conditions before the implementation. We take the risk that the answers may not be accurate because at the moment of the interviews the transport conditions were much better than before.

  The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses. The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people) during five days in all three periods (2009, 2010 and 2011), thus making it possible to compare the results. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews. The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

  The interviews were carried out in a public transport stop in Ciurea (in the same location each year). We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole village because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

- The vehicle occupancy indicator (inhabitants of Ciurea) was determined by counting for five days passengers living in Ciurea who use the new bus line.

C1.3 Methods for Business as Usual scenario

Before implementing this measure, the transport services were performed by minibuses. A minibus has a legal transport capacity of 18 persons. Because of the high transport demand, the vehicles were very crowded.

Since there are no data on the number of passengers on this route, we are making the following assumptions for the evaluation process:
- the private operator (that carried most of the passengers to Iasi) used 4 minibuses per hour
- the duration of a round trip was 60 minutes
- the number of passengers transported by one minibus during a round trip was 60
- the number of Ciurea inhabitants transported during a round trip was 30
- the number of round trips made each day was equal to that made by buses after the implementation of the measure (72).

There is the risk that more than 60 people were transported by one minibus during one trip. This number is, however, limited by the low capacity of minibuses. There is also the risk that the number of Ciurea inhabitants transported per minibus differed from our assumption. The same risk holds for the duration of a round trip.

If this measure had not been implemented, the public transport between Ciurea and Iasi would still be provided by minibuses, and the transport conditions would still be inappropriate.

C2 Measure results

C2.1 Transport

The number of passengers was counted inside the buses in order to determine the total number of people who use bus line 41b. The passengers transported by one bus during a round trip in peak hours and off peak hours were counted, and the arithmetic mean was considered to represent the average number of passengers transported each round trip by a bus during that day. This process was repeated during 5 workdays, both during peak hours and during off-peak hours, but not at the same hours each day, with a view to cover the whole intervals (from the total of 18 operation hours, 9 are considered peak hours and 9 off-peak hours). The average of the results obtained during the 5 days was then calculated. This process was repeated in each of the three years (2009, 2010 and 2011), and the results are provided in table C2.1.1.

Table C2.1.1 Vehicle occupancy – total number of passengers

Indicator	After		
	2009	2010	2011
8. Vehicle Occupancy Passengers/round trip/day	153	165	170

Fig.3 Number of passengers per round trip

Fig. 3 shows the total number of passengers (some living in Ciurea, others living in Iasi) travelling by one bus on a round trip (80 minutes).

We take the BaU scenario while assuming the risks of the following assumptions:
- the duration of a round trip is 60 minutes;
- a minibus transported about 60 passengers per roundtrip in 2008
- 30 of the passengers transported by a mminibus during a round trip lived in Ciurea

In order to compare the BaU scenario with the situation after the implementation of the measure we consider that the duration of a round trip made by a minibus is 80 minutes. The number of passengers who live in Ciurea is 40 (determined by calculating the weighted average).

In the situation after the implementation:
- we know that it takes 80 minutes for a bus to make a roundtrip
- we know that a bus transported 153 passengers per roundtrip in 2009

The inhabitants of Ciurea who travel by bus line 41b were counted on the section between Rond CUG (the boundary of the city of Iasi) and Ciurea. The following results were obtained:
- in 2009, from the total of 153 passengers transported per round trip, 72 live in Ciurea.
- in 2010, from the total of 165 passengers transported per round trip, 79 live in Ciurea.
- in 2011, from the total of 170 passengers transported per round trip, 85 live in Ciurea.

Table C2.1.2 Vehicle occupancy – inhabitants of **Ciurea**

Indicator	B-a-U (2008)	After		
		2009	2010	2011
Vehicle occupancy Inhabitants of Ciurea/round trip	40	72	79	85

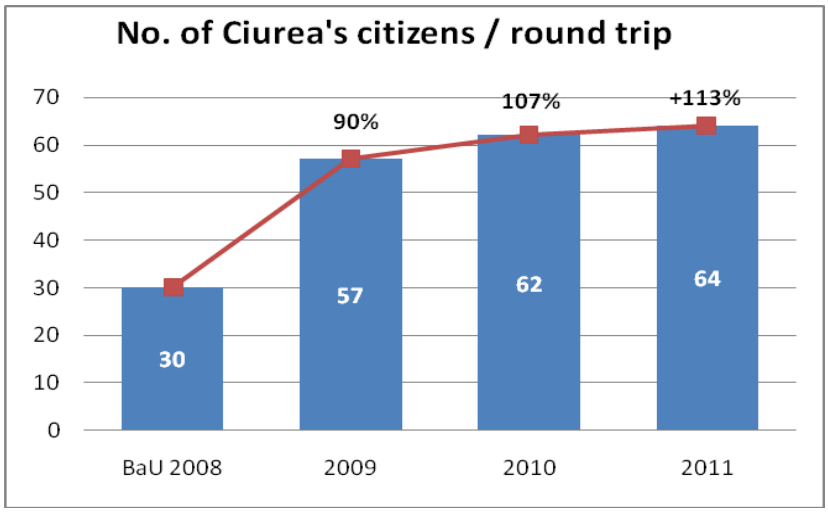


Fig. 4 The number of Ciurea inhabitants transported each round trip

Fig. 4 shows that the number of Ciurea inhabitants transported per round trip increased, compared to the BaU scenario, each year after the implementation, so that in 2011 53% more passengers were transported than in 2008, when 40 passengers per round trip were recorded. This increase is fully explainable by the higher transport capacity of buses compared to minibuses. However, several aspects should be taken into account: the transport demand was higher compared to the small transport capacity of minibuses, the number of passengers transported by a minibus, besides the fact that it was over the legal limit, created discomfort, and the people living in Ciurea who did not want to travel in such conditions had to find other means of transport, such as their private cars, taxis, bicycles, which meant higher costs, or additional effort and time to reach the destination in case of those who used bicycles.

The data provided by the transport company indicates that all buses on line 41b, which links Ciurea to the city center, made a total of 72 round trips per day. We consider that the minibuses in the BaU scenario made the same number of round trips a day. If we refer only to the total number of Ciurea inhabitants transported on this route, and taking into account a total of 21 days per month, we obtain the data shown in Fig. 5.

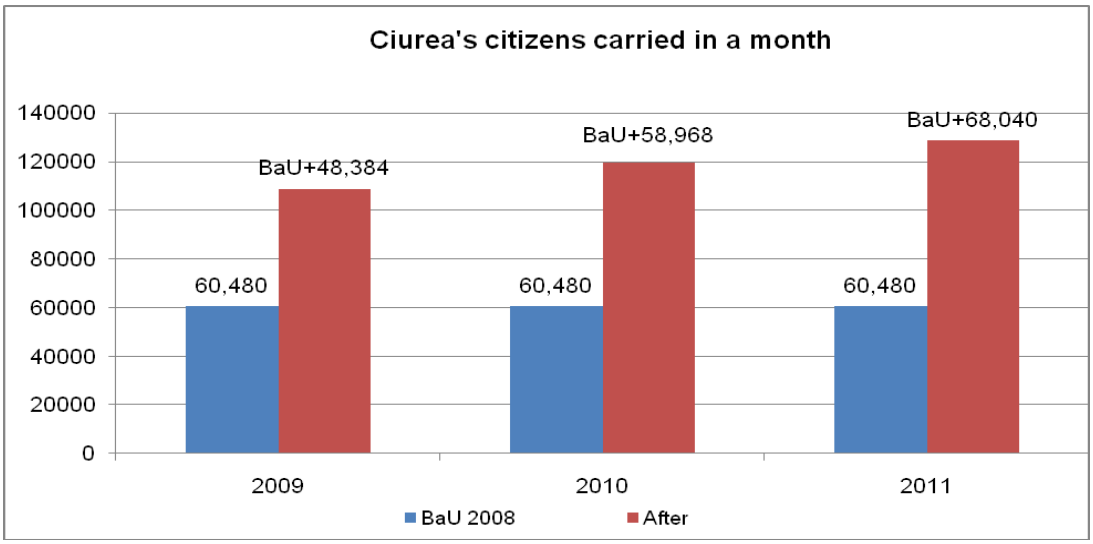


Fig. 5 The number of Ciurea inhabitants carried in a month

Figure 5 shows that the number of Ciurea inhabitants transported in a month on line 41b was very high, and that it increased continuously throughout the periods analysed. Thus, compared to the situation before the implementation of the measure (the BaU scenario), in which 60,480 people living in Ciurea were transported in a month, 48,384 more passengers were transported in 2009, 58,968 in 2010, and 68.040 in 2011.

C2.2 Society

For the determination of the awareness and acceptance level indicators, students conducted interviews among the inhabitants of Ciurea. Figure 6 provides a characterisation of the respondents.

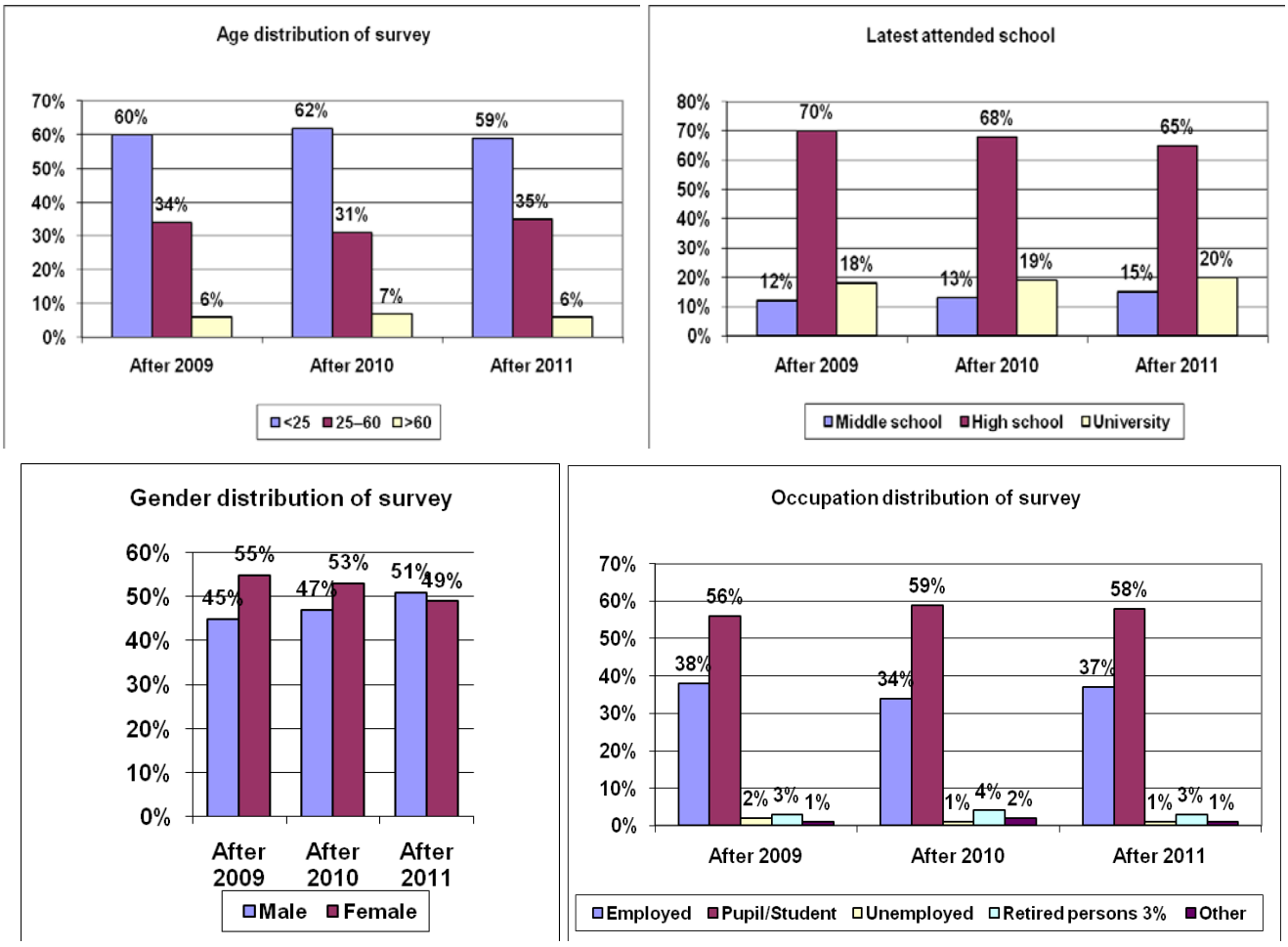


Fig. 6 Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 6), we notice the following evolutions in the three periods after implementation:

- most of the interviewees are within the 25 to 60 year-old bracket in all the three periods (60%, 62%, and 59%, respectively);
- most of them have attended only high school (70%, 68%, and 65%, respectively);
- while in the first two periods most of the interviewees are female (55% and 53%, respectively), in the third period most of the respondents were male (51%);
- most of the interviewees are students (56%, 59%, and 58%, respectively), and there are also many employed people among the respondents (38%, 34%, and 37%, respectively).

Table C2.2.1 Awareness level

Although the survey from January 2009 was conducted immediately after implementation, it includes questions from which we can extract the BaU scenario both for the awareness level as well as for the acceptance level.

Indicator		B-a-U (2008)	After (2009)	After (2010)	After (2011)
13. Awareness level (%)	1. very bad	2%	46%	49%	48%
	2.	5%	24%	25%	26%
	3	12%	23%	21%	22%
	4	34%	6%	4%	3%
	5. very good	47%	1%	1%	1%

The BaU scenario from the viewpoint of the awareness level is shown by the following questions (see Annex 1) asked during the first session of interviews after the implementation of the measure in 2009:

How do you find the transport services made by the low-capacity vehicles of the private operator that used to run before bus line 41b was created?

The following questions were asked for the situation after the implementation:
1. How do you find the idea of high-capacity vehicles operating on public transport routes?

2. How do you find the idea of the creation of bus line 41b, as part of the ARCHIMEDES project, in order to provide civilised transport conditions to the inhabitants of Ciurea and to encourage them to use public transport services instead of private cars?

Both the table above, C2.2.1, and the graphical representation of the awareness level indicator for the situation after the implementation contain the average of the percentage value resulted from the answers to the two questions for each of the five response options.

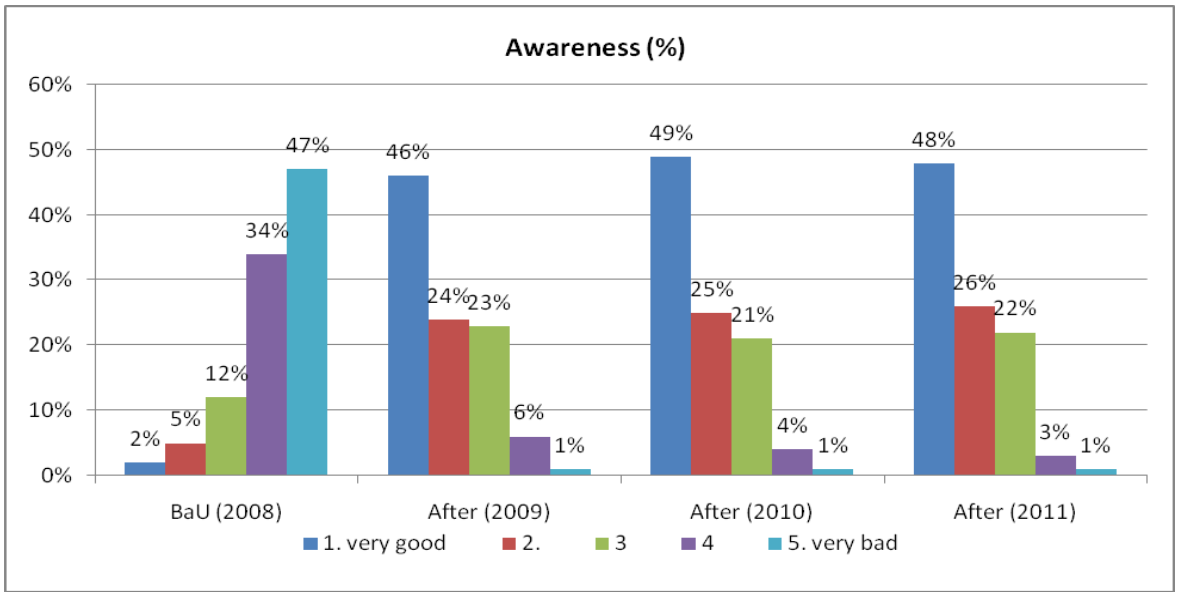


Fig. 7 Awareness level in 2008-2011

On analysing the data in Fig. 7, we see that before the implementation of the measure over 80% of the respondents (points 4 and 5) considered that transport services provided by low-capacity vehicles were inappropriate. After implementation, the percentage of respondents (points 1 and 2) who agree that public transportation should be provided by high-capacity vehicles and that the improved transport conditions of the new bus line encourage people to use public transport instead of private cars increased from 70% in 2009 to 74% in 2010 and 2011. As mentioned in the baseline section, we take the risk that the answers may not be accurate because at the moment of the interviews the transport conditions were much better than before.

Table C2.2.2 Acceptance level

Indicator		B-a-U (2008)	After (2009)	After (2010)	After (2011)
14. Acceptance level (%)	1. total dissatisfied	3%	40%	45%	44%
	2.	6%	38%	40%	39%
	3.	13%	18%	11%	14%
	4.	25%	2%	3%	2%
	5. total satisfied	53%	2%	1%	1%

Regarding the acceptance level, the answer choices to these questions are the same both for the BaU scenario, as well as for the situation after implementation (see Annex 1). What differs is the question which in the BaU scenario refers to transport services provided by the private operator, and after the implementation of the measure refers to the public transport company:

How satisfied were you with the following aspects related to the transport services provided by the private operator whose minibuses used to link Ciurea to Iasi before the implementation of this measure?

How satisfied are you with the following aspects of the services offered by the public transport company of Iasi?

1. frequency of public means of transport.
2. travel time.
3. travel conditions (comfort, degree of occupancy).

Both the table above, C2.2.2, and the graphical representation of the acceptance level indicator for the situation after implementation contain the average of the percentage value resulted from the answer to the question for each of the five response options.

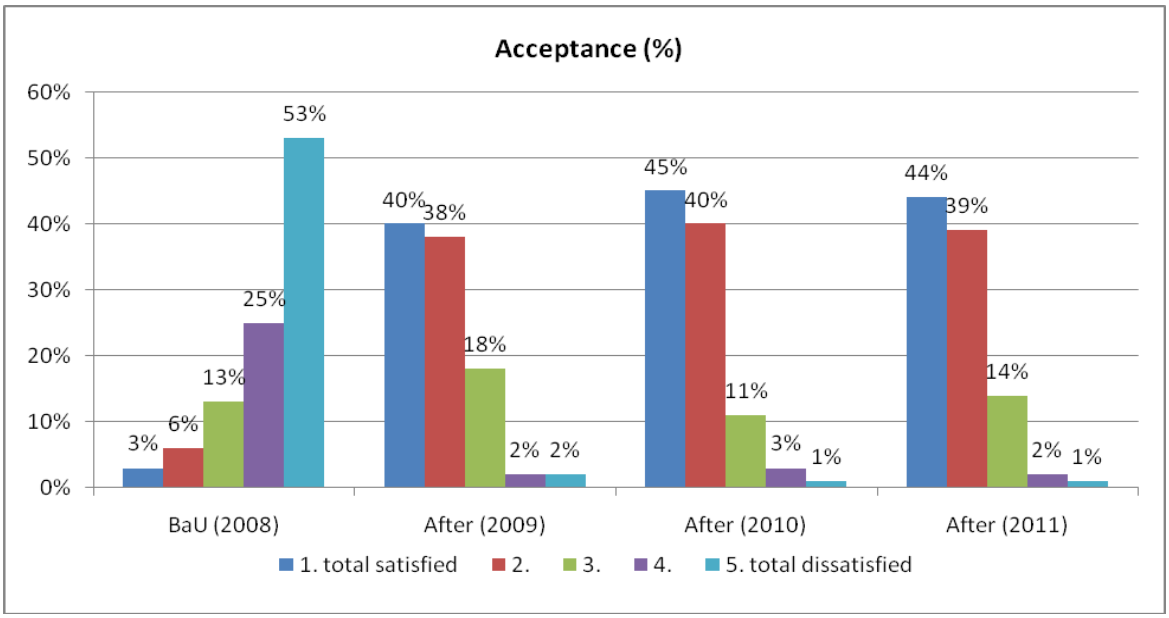


Fig. 8 Acceptance level in 2008-2011

On analysing the answers of the interviewees regarding the transport services provided by the private operator before the implementation of this measure (Fig. 8), we see that over 70% of them (points 4 and 5 - BaU scenario) were not satisfied with these services (frequency of vehicles, travel time, comfort, etc.). After implementation, the percentage of the respondents (points 1 and 2) who are satisfied with the transport conditions provided by the new bus route 41b increased from 78% in 2009 to 83% in 2011.

We take the same risks as with the evaluation of the awareness level indicator concerning the objectivity of the answers given by the respondents.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To create a bus line that would link the village of Ciurea to the city of Iasi.	★★
NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%) ★★ = Achieved in full ★★★ = Exceeded		

C4 Methods for upscaling

This measure can be implemented in other rural regions of the Metropolitan Area (Map 1). The main investments would be in purchasing buses. The most important benefits for the inhabitants of the villages would be a schedule-based transport, large-capacity vehicles, good travel conditions. On the other hand, the public transport company would also benefit from the extension of this measure, the increase in passenger number leading to an increase of revenues.

Map 1 Rural regions within Iasi Metropolitan Area

C5 Appraisal of evaluation approach

The most difficult part in the evaluation process was the fact that, because of the lack of data on several aspects related to public transport services before the implementation of the measure, the BaU scenario was based on some assumption. These assumptions were related to: the number of minibuses which provided public transport services, the duration of a round trip, the number of passengers transported and the total number of round trips made per day.

If this evaluation process were to be resumed, the interviews would probably be conducted on a much larger sample of citizens and in several locations, so that the impact of the measure could be demonstrated on a larger scale.

C6 Summary of evaluation results

The results of the evaluation of the indicators of this measure revealed the following:

- In terms of awareness, over 80% of the interviewees believed that in 2008 transport services made

by low-capacity vehicles were inappropriate. After the implementation of the measure, the percentage of the respondents who agreed that the new route operated by high-capacity vehicles encouraged the use of public transport instead of private cars increased from 70% in 2009 to 74% in 2011.

- In terms of satisfaction degree, in 2008 over 70% of the respondents were not satisfied with the transport services provided by the private operator (vehicle frequency, travel time, comfort, etc.). After the creation of the new bus route, the satisfaction degree has had an ascending trend: it increased from 78% in 2009 to 83% in 2011. These high percentages are easy to explain through the improvement of the transport conditions the public operator provided: observance of the timetable, reduced travel time, frequency and transport capacity of vehicles adapted to transport needs, comfort, longer route, which enables Ciurea inhabitants to reach the most important educational, public, and cultural institutions in Iasi using just one means of transport.

- The number of Ciurea inhabitants who travel by the buses of line 41b per month increased constantly each year from 60,480 in 2008 (BaU scenario) to 108,864 in 2009 and to 128,520 in 2011.

C7 Future activities relating to the measure

The public transport company will continue to maintain this bus line after the project has ended. Moreover, the public transport company and the city of Iasi will try to create new bus lines to connect other rural regions of the Metropolitan Area to the city.

D Process Evaluation Findings

D.0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D.1 Deviations from the original plan

No deviations from the original plan mentioned in the "Description of Work" were recorded during the implementation of the measure.

In terms of the evaluation process, in order to determine the results of the indicators set in this measure, we have decided to analyse both the opinions of young people belonging to the Romany community, as well as those of young Romanians and of Ciurea inhabitants belonging to other age groups and who work in Iasi. The same principle was followed when Ciurea inhabitants who use public transport to go to Iasi were counted. The reasons for this decision are the fact that public transport is for all people, regardless of their ethnicity, age group, or occupation, and the fact that the opinions of all passengers help improve the quality of public transport services.

D.2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **2. Institutional**: A new line linking the city of Iasi to Ciurea, a village with a significant number of Romany inhabitants, was difficult to be created for the public transport operator because in the same area a private operator performed the public transport services.

Implementation phase

- **1. Political/strategic**: Insufficient involvement of (political) key stakeholders in solving the problem regarding the quality of the transport services performed in Ciurea.

Operation phase

- **3. Cultural**: Some of the Ciurea inhabitants do not pay for the public transport services they benefit from (they do not buy tickets).

D.2.2 Drivers

Preparation phase

- **5. Involvement, communication**: Ciurea inhabitants complained repeatedly about the transport services of the private operator, which caused great priority in solving this problem.

Implementation phase

- **1. Political/strategic**: The inhabitants of Ciurea together with the mayor of Ciurea requested the Iasi County Council to create a new bus line to link the village to the centre of the city of Iasi.

Operation phase

- **2. Institutional**: More facilities in terms of fares have been introduced for the inhabitants of Ciurea.

D.2.3 Activities

Preparation phase

- **5. Involvement, communication**: There were several meetings between representatives of the Ciurea community and of the administration of the village on the one hand, and with representatives of the County Council of Iasi on the other hand. The public transport company and the local administration of the city of Iasi were also involved.

Implementation phase

- **8. Organizational**: The public transport company created the new bus line and integrated it into its transport plan.

Operation phase

- **8. Organizational**: Ticket inspectors travel more often with buses of the line linking Ciurea and Iasi in an attempt to reduce fare evasion.

D.3 Participation

D.3.1. Measure Partners

- **Iasi Municipality (Leading role):**

- organised a meeting with Ciurea Village Hall to create a public transport link (a bus line) between the two localities;

- signed an association agreement with the village of Ciurea, which was approved through County Council Decision no. 268/2008 for establishing a new public transport line;

- assigned the new bus line to the public transport company of Iasi.

- **Ciurea Village Hall (Principal participant)** – signed the association agreement with the Municipality of Iasi for the new bus line..

- **The public transport company of Iasi – RATP Iasi (Principal participant) –** responsible for operating the new bus line 41b that links Ciurea to Iasi.

- **Technical University Iasi (Occasional participant)** – The Management Department within the Faculty of Machine Construction and Industrial Management organised surveys for the assessment of the measure.

D.3.2 Stakeholders

- **Passengers living in Ciurea –** they benefit directly from the implementation of the measure, and they represent the "promoters" of the new bus line through their requests for the improvement of transport services

- **Other passengers –** between Ciurea and Iasi there are two villages whose inhabitants use this bus line without being involved in its creation.

- **Different companies placed between Ciurea and Iasi** – their employees travel using bus line 41b, with no involvement in the implementation of the measure.

- **Recreational areas** – in the summer time several recreational areas placed in the proximity of the route of this bus line benefit from this measure because their clients have an easy and less expensive mode of transport.

D.4 Recommendations

D.4.1 Recommendations: measure replication

- **Establishing possible links between city and neighbouring villages**: The measure was conceived both to facilitate the access of young Romany people who live in the Ciurea village to educational institutions in the city of Iasi, and to provide a good-quality link to the city for the rest of the inhabitants of the village. Such circumstances are probably too rare to be the case of replicating this measure elsewhere. However, creating bus links between a city and the neighbouring villages when there are no other possibilities of transport apart from private cars should always be encouraged.

D.4.2 Recommendations: process (related to barrier-, driver- and action fields)

- **Analyzing demand transport capacity**: The number and capacity of the buses has to be adapted to demand. If new buses have to be purchased in order to create such a line, a thorough analysis of the demand has to be conducted in order not to underestimate it. The opportunity of introducing an experimental temporary line, which would help determinate demand, can also be considered.
- **Fares of transport**: Attention also has to be given to how fares are set. The same type of facilities passengers in the city benefit from should be valid for passengers moving between the two areas. However, the fares have to be adapted to the distance passengers travel on.

ANNEX 1

Questionnaire – after situation

M. 11 - New school bus link – 41b

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Your profession _____.
4. Last attended school _____.
5. When I go by public means of transport, I prefer to use a::
   □ one-trip ticket □ two-trip ticket
   □ set of 10 trips □ monthly season ticket

6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____
7. How do you find the idea of high-capacity vehicles operating on public transport routes?
   □ very good □ good □ not bad □ bad □ very bad

8. How do you find the idea of the creation of bus line 41b, as part of the ARCHIMEDES project, in order to provide civilised transport conditions to the inhabitants of Ciurea and to encourage them to use public transport services instead of private cars?
   □ very good □ good □ not bad □ bad □ very bad

9. What means of transport did you use before this bus line was created?
   □ minibuses of a private operator □ my car □ bicycle □ walking □ other

10. How did you find the above-mentioned means of transport at that moment?
    □ very good □ good □ not bad □ bad □ very bad

11. The idea of introducing special bus lines for residents of the metropolitan area seems:
    □ very good □ good □ not bad □ bad □ very bad

12. Do you think that the number of vehicles currently operating on the special line (41b) is enough for the number of users?
    □ yes □ no □ I don't know

13. In what areas of Iasi do you think that such special lines should be extended to cover people's needs?

14. How satisfied were you with the following aspects related to the transport services provided by the private operator whose minibuses used to link Ciurea to Iasi before the implementation of this measure?

	very satisfied	satisfied	almost satisfied	disatisfied	very dissatisfied
Frequency of public means of transport	□	□	□	□	□
Travel time	□	□	□	□	□
Travel conditions (comfort, degree of occupancy)	□	□	□	□	□

15. How satisfied are you with the following aspects of the services offered by the public transport company of Iasi?

	very satisfied	satisfied	almost satisfied	disatisfied	very dissatisfied
Frequency of public means of transport	□	□	□	□	□
Travel time	□	□	□	□	□
Travel conditions (comfort, degree of occupancy)	□	□	□	□	□

16. Do you have any suggestions on how transport services can be improved for people who must commute between Ciurea and Iasi using public transport?

Thank you.

Executive summary

The Municipality of Iasi together with the public transport company decided to start modernising the ticket distribution system in the city. Due to this measure 10 ticket vending machines (TVMs) were purchased and installed mainly along the CIVITAS corridor in public transport stops selected by several criteria: ticket demand throughout the day, existence of surveillance infrastructure in the area, balanced distribution throughout the city.

Surveys were conducted to assess the impact of the measure. Key results are:

- the value of the quality of service indicator shows an increase by 15% of respondents' satisfaction with the new ticket distribution system;
- the value of the awareness level indicator reveals that 21% more interviewees have heard of the project and of this measure;
- the value of the acceptance level indicator has had an ascending trend, with an increase of 12% among the respondents

For the cost-benefit analysis, the data regarding the number of tickets sold and regarding the maintenance operations of kiosks and of TVMs, respectively, came from the public transport company. This analysis has shown that the operating costs have decreased by around 90% after ten of the kiosks were replaced with TVMs, which has lead to a net present value (NPV) of 409,276 €.

The following can be regarded as lessons that were learned during the implementation of this measure:

- the training regarding the maintenance of TVMs must be very well organised
- for a greater and faster success of the measure, apart from an easy-to-use interface – which is a must – trained personnel should show people at the beginning how to use a TVM

The analysis of the monthly numbers of tickets sold reveals the fact that, four months after the installation of the TVMs, these numbers reached the same values as those previously recorded by selling tickets at the kiosks. This testifies to a favourable response to the new ticketing system on the part of the public transport users.

From the point of view of the measure impact, the 10 TVMs represent for the city of Iasi a step forward towards modernity and towards complying with European standards, and for the transport system in the city they are a very much needed and awaited improvement in terms of reliability, accessibility, and effectiveness.

IAS 12 - Improved Ticketing

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To reduce traffic congestion by encouraging the use of public transport instead of private cars.

(B) Strategic level:

- To improve the quality of public transport services by offering a more comfortable and modern way of purchasing tickets.

(C) Measure level:

- To decrease operating costs by replacing ticket kiosks with TVMs.
- To increase operating revenues by replacing ticket kiosks with TVMs.
- To ensure distribution of tickets round the clock.

A1.2 Target groups

Taking into account that the TVMs are placed along the CIVITAS corridor and that the most important universities in Iasi, the campuses, and many schools are located on this corridor or in its proximity, the target group of this measure is represented by school and university students.

A2 Description

Ten TVMs have been installed along the CIVITAS corridor. The users interact with them via a touch screen having an easy-to-use interface. The system has a high degree of currency acceptance: coins, notes, chip cards, credit cards. The TVMs transfer and receive information from a centralised system through LAN.

A3 Person in charge for the evaluation of this measure

Names of persons	Cristian Nitisor - implementation Cristian Stoica - evaluation
Name of organization	IASI, PTI
Direct telephone	+40751700903, +40722229502
e-mail	c.nitisor@yahoo.com, s_tehnic@yahoo.com

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – the TVM system has made the acquisition of tickets easier because it functions 24/7.
- **Use of new technology/ITS** – the TVM system represents a new and modern technology for the city of Iasi
- **Targeting of specific user groups** – from the total number of passengers that use public transport on the CIVITAS corridor, school and university students have the highest percentage.

B2 Research and Technology Development

B3 Situation before CIVITAS

Prior to the implementation of this measure, the ticket distribution system in Iasi belonging to the public transport company consisted only of 56 selling points, 20 of which also functioned as dispatching centres, opened throughout the day and generally placed at the last stops of tram and bus lines. The remaining 36 selling points cover all main areas of the city and their opening hours have been set depending on the level of purchase demand. Some of them are closed during the weekend.

On the one hand, the expenditures for keeping some of them open even for just one shift every day (which results in complaints coming from public transport users) would have also exceeded the amount of earnings. On the other hand, most of the selling points with longer opening hours (two shifts) still did not meet passengers' demands. Their time table was established according to the little-varying number of employees set for this activity (a rise of which would have meant a rise of expenditures) and to the legal requirements for resting times.

B4 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: (September-October 2011) – the tender documentation for TVMs was prepared and the tender procedure was organised

Stage 2: Contract (October 2011) – a contract was signed with the winner of the tender.

Stage 3: Implementation (October 2011 - May 2012) – the TVMs were installed.

Stage 4: Evaluation (before data collection – May 2011, after data collection – between June and September 2012) – data for the measure assessment was collected and surveys were organised.

The Municipality of Iasi organised a tender procedure for the acquisition of the 10 TVMs (Fig. 1).

Fig. 1 Ticket vending machine

They were installed in the most crowded stops along the CIVITAS corridor and in a few other stops throughout the city (see Figure 2).

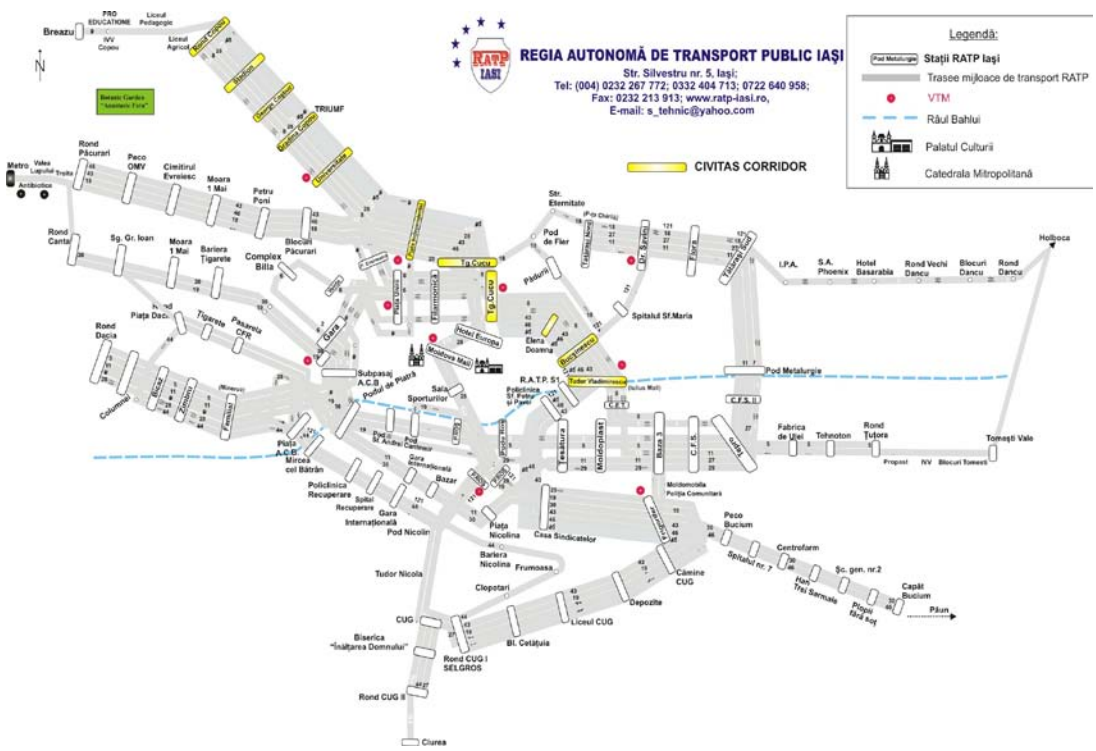


Fig. 2 The locations of the 10 TVMs

The experience of the transport company has shown that the demand of tickets at these stops is particularly high both during the opening hours of the kiosks next to which the TVMs have been installed, as well as after the kiosks are closed. There are very many crowded stops outside the CIVITAS corridor, so that further criteria for choosing the location for the remaining TVMs were necessary. One was the existence of surveillance infrastructure so that the TVMs can be constantly monitored especially until they cease to be perceived as new items (which have been noticed to be particularly prone to vandalism) and the other was a balanced distribution throughout the city.

The technical details of the components and about how the TVMs function are presented in Annex 1.

Examples of press reactions are to be found in Annex 2.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- Measure BH 10 – Multi-modal ticketing in Brighton & Hove
- Measure IAS 35 – Education and promotion programme

C Impact Evaluation Findings

C1 Measurement methodology

C1.1 Impacts and Indicators

C1.1.0 Scope of the impact

There are two major types of impacts:
- social – people can buy tickets round the clock, but, more importantly, during the whole operating day of the public means of transport (around 18 hours);
- economic – the expenses for the TVMs are lower than those for the ticket sellers

C1.1.1 Selection of indicators

No.	Evaluation Category	Evaluation Sub-Category	Impact	Indicator	Description	Data /Units
1	**Economy**	**Benefits**	Operating Revenues	Operating revenues	Revenues per TVM	Euro/TVM
2a		**Costs**	Operating Costs	Operating costs	Costs per TVM	Euro / TVM
2b			Capital Costs	Capital costs	Costs per TVM	euro / TVM
2c			Maintenance costs	Maintenance costs	Costs per TVM	euro / TVM
13	**Society**	**Acceptance**	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
19	**Transport**	**Quality of service**	Quality of service	Quality of service	Survey	Index (%)

C1.1.2 Methods for evaluation of indicators

No.	Indicator	Target Value	Source of Data and Methods	Frequency of Data Collection
1	Operating revenues	Increased operating revenues obtained from selling tickets through TVMs instead of kiosks.	We calculated operating revenues obtained from selling tickets at a kiosk during one month, and we compared them to the revenues obtained from a TVM.	June-September 2012
2a	Operating costs	A decrease of operating costs by replacing ticket kiosks with TVMs	The operating costs of a TVM were compared to the operating costs of a ticket kiosk (cost of data transfer, consumables, etc.)	June-September 2012
2b	Capital costs	110.340 Euro	The capital costs represent the amount spent for purchasing 10 TVMs (85,340 Euro) and the costs for training the maintenance and operation personnel (25,000 Euro).	Once, when the contract was signed
2c	Maintenance costs	-	The maintenance costs are made up of the total costs of maintaining one ticket selling unit (kiosk / TVM)	June-September 2012
13	Awareness level	Improved	A survey was conducted to assess these indicators. The interviews* were carried out by students in a public transport stop during five working days, before and after the measure implementation. 100 persons were interviewed in each stage (see section C.1.2 for details). Details on the survey campaign are given below. **May 2011.** The survey for this measure was conducted (using 100 questionnaires) on passengers in the proximity of a public transport stop. For the assessment of the awareness level, the respondents were asked if they had heard about the CIVITAS project and if they knew that 10 TVMs had been installed as part of this measure. For the evaluation of the acceptance indicator, the interviewees were asked to answer on a five-point scale if the public transport company should improve the ticket vending system; whether ticket vending machines placed in public transport stops would be efficient; if ticket vending machines should be installed at all stops. In order to determine the quality of service indicator, the respondents were asked if they were satisfied about the old ticket vending system of the public transport company, about the personnel that sold tickets and season tickets at kiosks, and about the degree of accessibility to these kiosks in terms of location and opening times. **July and September 2012.** Another set of 100 questionnaires were used for face-to-face interviews in both instances. The surveys were conducted in the same place as in 2011. The questions for assessing the awareness level remained the same, but they were adapted to the stage the task was in (already implemented). In order to assess the acceptance level, the respondents were asked, among others, if the recently installed TVMs were well received among people, and if they preferred buying tickets from TVMs instead of kiosks. To asses the quality of service, the respondents were asked if they were satisfied about the improvement of the ticket distribution system of the public transport company, about the TVMs, and about the accessibility to the TVMs with respect to location and opening hours.	Before – May 2011 After – July and September 2012
14	Acceptance level	Improved		
19	Quality of service	Improved		

* The questionnaire for carrying out the interviews is to be found in ANNEX 3.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	Operating revenues	M33	PTI – Dana Cernat
	Operating costs	M33	PTI – Dana Cernat
	Capital costs	Not applicable	PTI – Dana Cernat
	Maintenance costs	M33	PTI – Dana Cernat
	Awareness level	M33	TUI
	Acceptance level	M33	TUI
	Quality of service	M33	TUI
Collection of after data	Operating revenues	June – September 2012	PTI – Dana Cernat
	Operating costs	June – September 2012	PTI – Dana Cernat
	Capital costs	October 2011	PTI – Dana Cernat
	Maintenance costs	June – September 2012	PTI – Dana Cernat
	Awareness level	July and September 2012	TUI
	Acceptance level	July and September 2012	TUI
	Quality of service	July and September 2012	TUI
D12.2 Baseline and first results from data collection	All indicators	Month 33	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 49	

C1.2 Establishing a baseline

We analysed the data related to the ticket selling kiosk placed next to Moldova Mall and the data related to the TVM that completely replaced this kiosk after the measure was implemented. The data obtained was multiplied by 10, which is the number of the TVMs installed.

We used the year 2011 as a baseline year for comparing the evolution of the indicators.

The time intervals used in the evaluation process are June-September 2011 and June-September 2012. The reason is that the first TVM was installed in May 2012 and the data started to be collected in June 2012.

The evaluation process included the comparison of the following:

- the operating costs (that include, where applicable, labour costs, electricity, paper ticket costs, and cost of data transfer) of a kiosk in 2011 with the operating costs of a TVM in 2012.

- the operating revenues obtained from the tickets sold at the "Moldova Mall" kiosk in June-September 2011 with the operating revenues obtained from the tickets sold at the "Moldova Mall" TVM during the same period in 2012. The kiosk was removed shortly after the TVM has been installed.

- the maintenance costs of a kiosk with the maintenance costs of a TVM.

We have to mention that there were no changes in the cost of a trip during 2011 and 2012.

The values of the economic indicators assigned to ticket distribution are obtained from the financial records of the public transport company and from the reports generated by the back-office application of the TVMs (see Annex 4 – Reports on tickets sold at Moldova Mall in June-September 2012).

In order to assess the awareness level, the acceptance level and the quality of service surveys were conducted among the inhabitants of the city of Iasi. The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people) after the measure has been implemented, thus making it possible to compare the results of the "before" (May 2011) and the two "after" situations (July and September 2012). The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

The interviews were carried out in the same public transport stop during the three periods the surveys took place in before and after the implementation of the measure. We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced

only by the people who happened to be there and by the circumstances specific to the area. We cannot extrapolate the results to a larger area, particularly to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

C1.3 Methods for Business as Usual scenario

The business as usual scenario is the situation that does not include TVMs as ticket selling points. The ticket distribution system in Iasi continues to be composed of 56 selling points, 20 of which also function as dispatching centres, which are generally placed at the last stops of tram and bus lines and are opened from the beginning to the end of the program of public means of transport. The remaining 36 selling points cover all main areas of the city and their opening hours are set depending on the level of purchase demand.

In order to keep the elements of comparison consistent, the BaU scenario includes estimations for 10 kiosks because 10 TVMs have been installed.

The annual values of the economic indicators are updated with the annual inflation rate for energy, fuel, urban transport, railway transport, etc. (Table 1). This rate was published by INS (the National Institute of Statistics) for 2011. The forecasting for 2012-2014 was made by BNR (the National Bank of Romania). Our estimation for the period 20015-2016 has not been mentioned within the public sources of BNR yet.

	INS	**BNR**			**Our estimations**	
Annual inflation rate	2011	2012	2013	2014	2015	2016
	5.79%	5.32%	6.89%	6.60%	6.60%	6.60%

Table 1: Estimated annual inflation rate by two sources (INS and BNR)

The risk of the BaU scenario is represented by the dynamics of the evolution of tickets sold, which is influenced not only by the way the public transport company manages its vehicle fleet, but also by a series of social and economic factors at local and/or national level.

C2 Measure results

C2.1 Economy

Table C2.1.1 Operating revenues

1. Operating revenues	**Before (2011)**	**BaU (2012)**	**After**
Euro / 10 units / year	394,320	394,320	394,320

1. Operating revenue	**Difference: After –Before**	**Difference: After – BaU (2012)**
Euro / 10 units / year	0	0

The data obtained is explained below.

The data below is based on the information provided by the public transport operator, and concern the same location, “Moldova Mall”, where the kiosk that operated in 2011 was replaced with a TVM in 2012.

The number of tickets sold in June-September 2011 and 2012, respectively, is the sum of all one-way tickets and all round-trip tickets (Table 2). The choice of buying one-trip or round-trip tickets belongs solely to the public transport user, without any influence from the ticket distribution system.

We have not included in our analysis the value of season tickets. TVMs do not release season tickets at this time because this first stage of operation was meant as a period of accommodation for users with the new technology.

	Moldova Mall – kiosk – 2011				**Moldova Mall – TVM – 2012**			
	June	**July**	**August**	**September**	**June**	**July**	**August**	**September**
No. of tickets sold	5300	4600	4200	3600	2877	3875	3671	5393
Value (Euro)	3438	3142	2813	2400	1605	2211	2123	3089

Table 2: Comparison between the revenues from the tickets sold at the kiosk (2011) and from those sold at the TVM (2012)

The number of tickets sold has progressed as follows:

	No. of tickets sold		Progress of tickets sold through TVMs compared to June
	Kiosk	TVM	
June	5300	2877	---
July	4600	3875	+ 35 %
August	4200	3671	+ 28%
September	3500	5393	+ 47 %

Table 3: Number of tickets sold in the period June-September 2012

Throughout the four months of operation, the number of tickets bought from TVMs has had a growing trend, so that in September 2012 it has reached the number of tickets that were sold before installing the VTMs (5300 tickets/month – Table 3). In September 2011, after the holidays, the decrease of the number of sold tickets can be explained by passengers' option to buy season tickets.

The total number of tickets sold includes one-trip, as well as two-trip tickets. Therefore, in order to keep the elements of comparison consistent, we will use for our analysis an average price of 0.62 euro/ticket (Table 4), at a monthly average of 5300 sold tickets, which results in operating revenues of 3286 euro for one selling point during the first year of operation, which means 39,432 euro/year. We multiply this value by 10, which is the total number of TVMs.

Monthly average	Kiosk	TVM
No. of tickets	4425	3954
Value (euro)	2948	2257
Average price per ticket	0.66	0.57
(euro/ticket)	0.62	

Table 4: Estimation of ticket sales in euros

We are assuming a reserved scenario, where the ratio of tickets sold at the 10 TVMs and at the 10 kiosks which were replaced by TVMs remains constant. Given the short time interval available for a comparative analysis, we regard it as important that the new distribution system does not lead to a decrease of operating revenues (Table 5).

1. Operating revenues euros/10 kiosk/ month	2012	2013	2014	2015	2016
BaU value	394,320	415,298	443,912	473,210	504,442
After value	394,320	415,298	443,912	473,210	504,442

Table 5: Prognosis of BaU and "after" values 2012-2016

The annual values are updated with the inflation rate; since in 2011 and 2012 the ticket price did not change, the values associated with the BaU and "after" scenarios are equal.

Table C2.1.2 Operating costs

2. Operating costs (10 units)	Before (2011)	BaU (2012)	After (2012)
Euro / year	102,480	108,414	10,320

Indicator	Difference: After – Before	Difference: After – BaU (2012)
2 Operating costs	-92,160	-98,094

Operating costs are explained below (Table 6):

- before the measure was implemented (the analysis is made for one ticket selling kiosk):
Labour costs, which include all the expenses of the employer with the ticket sellers (2 shifts/day):
16 hours/day * 30 days = 480 hours/month;
480 hours * 2.3 Euro/hour = 1104 Euro/month.
Electricity means the average electricity costs of the kiosk per month.
Paper tickets represent the costs of the paper used for printing a monthly average of 5300 tickets.

- after the measure was implemented (the analysis is made for one TVM):
Labour costs, which include all the costs of the employer with the employee who changes the safe deposit box of TVMs. This operation requires 1 hour every 2 days, meaning a total of 15 hours a month.
15 hours/month * 2.3 Euro/hour = 34.5 Euro/month
Electricity means the electricity costs of the TVMs.
Paper tickets represent the costs of the paper used for printing a monthly average of 3500 tickets.
Data transfer costs means the costs of internet data transfer.

2. Operating costs (euro)	Ticket selling kiosks Monthly average	Ticket vending machines Monthly average
Labour costs	814	25
Utilities (electricity)	31	20
Paper tickets	9	16
Data transfer costs	N/A	25
Total/unit	854	86
Total value of 10 units	8540	860

Table 6. Detailed operating costs

Thus annual operating costs for the 10 ticket selling units are 102,480 euro for kiosks and 10,320 euro for TVMs, respectively. The annual values are updated with the inflation rate (Table 7).

2.a Operating costs Euro/10 kiosk, annually	2011 (before)	2012	2013	2014	2015	2016
BaU Value	102,480	108,414	114,181	122,048	130,103	138,690
After value	---	10,320	10,869	11,618	12,385	13,202

Table 7: Operating costs: Estimation 2011-2016

Table C2.1.3 Capital costs

Indicator	Before (2011)	B-a-U (date)	After (2012)
2.b Capital costs	0	0	110,340 Euro

(for 10 units)			

In the case of the BaU scenario, no investments for purchasing TVMs are made. This situation is the same for the "before" data.

After the measure has been implemented, the capital costs represent the amount spent for purchasing 10 TVMs (85,340 euro) and the costs for training the maintenance and operation personnel (25,000 euro).

Table C2.1.4 Maintenance costs

2.c Maintenance costs (Euro)	Before (2011)	BaU (2012)	After (2012)
Euro / year; 10 units	2000	2116	1530

Indicator	Difference: After – Before	Difference: After – BaU (2012)
2c. Maintenance costs	- 470	- 586

For the year 2011 the monthly average spent for maintenance operations performed on one ticket selling kiosk was around 200 Euro. Extrapolating this to 10 kiosks we obtain a value of 2000 euro.

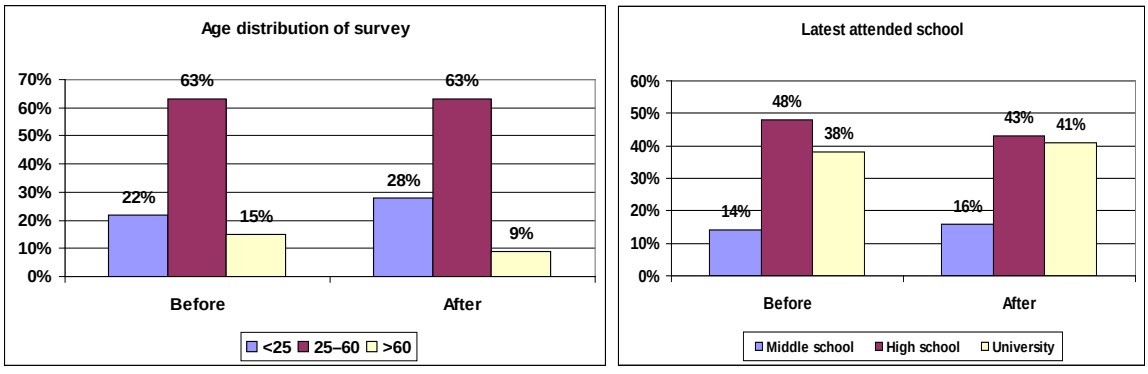
For the year 2012 the maintenance costs for all 10 TVMs represent the labour costs of the specialised maintenance team, namely 1,530 euro per month on average (Table 8). The annual values are updated with the inflation rate.

2.c Maintenance Euro/year, 10 units	2011 (before)	2012	2013	2014	2015	2016
BaU Value	2000	2116	2228	2382	2539	2707
After value	---	1530	1611	1722	1836	1957

Table 8: Maintenance costs: Estimation 2011-2016

C2.2 Transport

The interviews were carried out by students in a public transport stop. No special categories of respondents were chosen; on the contrary, persons belonging to various age, gender and occupational groups (school and university students, teachers, all kinds of employees, as well as unemployed people and retired persons). A brief characterisation of the respondents is provided in Figure 3 below:



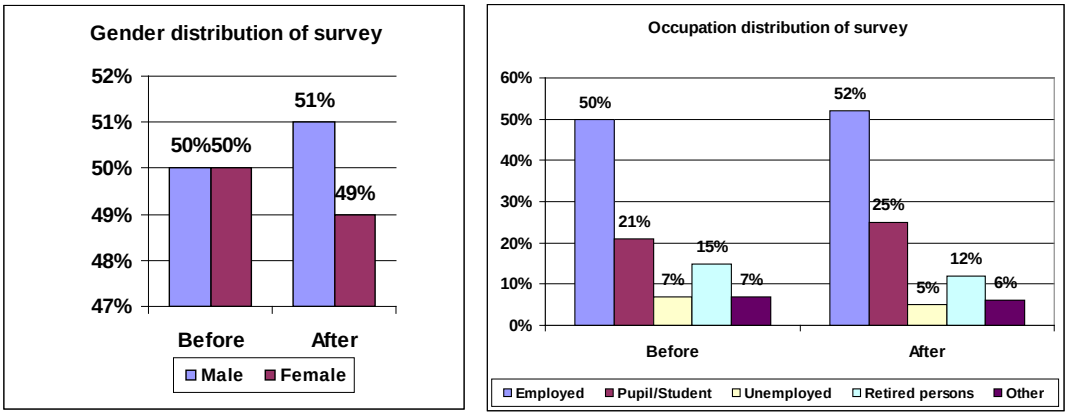


Fig. 3 Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 3), we notice the following evolutions in the "before" and "after" situations:

- Most of the interviewees are within the 25 to 60 year-old bracket (63%).
- Most of them have attended only high school (48% and 43%, respectively), and 38% and 41%, respectively, have also attended university.
- Both genders are (almost) equally represented.

Most of the respondents are employed (50% and 52%, respectively), to which a significant percentage of students adds (21% and 25%, respectively).

Table C2.2.1: Quality of service

Indicator		Before (May 2011)	After (July 2012)	After (September 2012)
15. Quality of service (%)	1. total satisfied	2%	3%	5%
	2.	8%	15%	20%
	3.	38%	41%	39%
	4.	30%	24%	21%
	5. total dissatisfied	22%	17%	15%

Indicator		Difference: After (July, 2012) – Before	Difference: After (September, 2012) – Before
Quality of service (%)	1. total satisfied	1%	3%
	2.	7%	12%
	3.	3%	1%
	4.	-6%	-9%
	5. total dissatisfied	-5%	-7%

For the assessment of this indicator, respondents were asked to answer how satisfied they are with the following:

"Before" situation:
1. the ticket selling system (kiosks)
2. the ticket sellers
3. the degree of accessibility of kiosks (in terms of location and opening times)

"After" situation:
1. the improvement of the ticket distribution system
2. the newly installed ticket vending machines

3. the degree of accessibility of kiosks (in terms of location and operating times)

Both the table above, C2.2.1, and the graphical representation of the quality of service indicator contain the average of the percentage value resulted from the answers to the three questions for each of the five satisfaction levels.

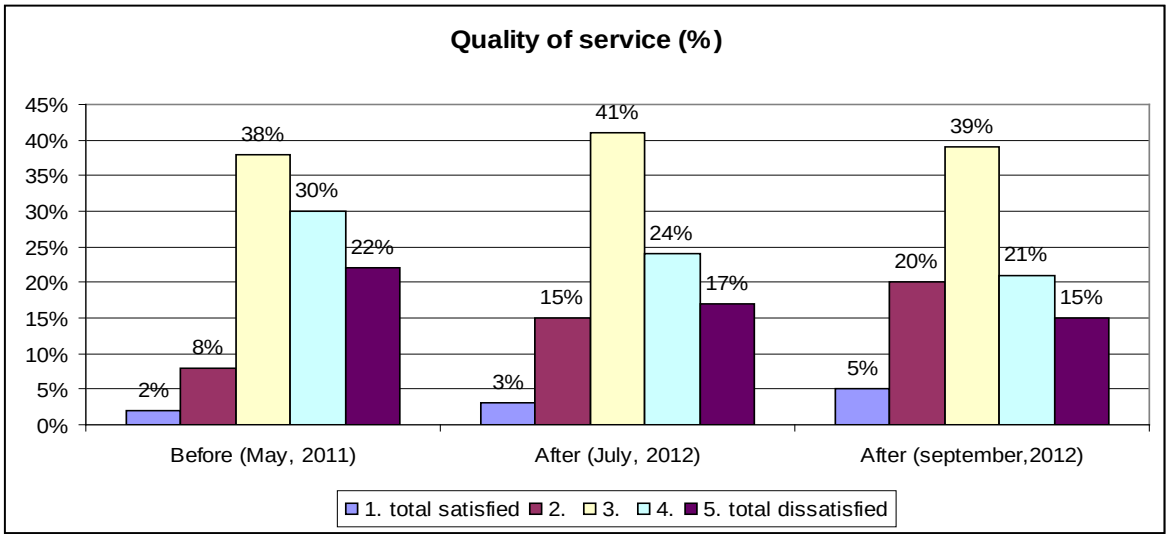


Fig. 4 Quality of service evolution (before – 2011, after – July, September 2012)

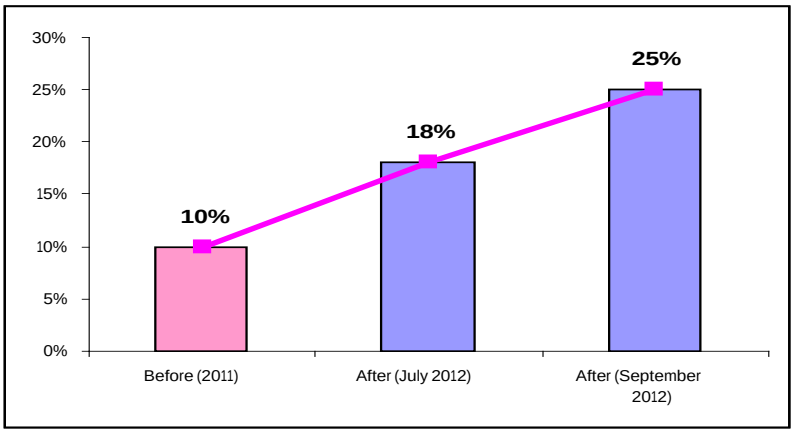


Fig. 5 Quality of service – positive feedbacks

The surveys carried out among passengers revealed an improvement of the quality of service. If we add the positive feedbacks (Fig. 4 – point 1 and 2 on the evaluation scale) registered for this indicator, we obtain an increase of 25% in September 2012, after implementation, compared to the level of satisfaction of 10 % registered in 2011 (Fig. 5). The number of passengers included in the "neither satisfied nor dissatisfied" category remained almost the same (around 39%).

C2.3 Society

Table C2.3.1 – Awareness level

Indicator		Before (2011)	After (July 2012)	After (September 2012)
13. Awareness level (%)	1. Yes	42%	60%	63%
	2. No	15%	12%	13%
	3. I don't know	43%	28%	24%

Indicator		Difference: After (July, 2012) – Before	Difference: After (September, 2012) – Before
Awareness level (%)	1. Yes	18%	21%
	2. No	-3%	-2%
	3. I don't know	-15%	-19%

For the evaluation of the awareness level indicator, the following questions were asked for both situations, before and after the implementation of the measure, however they were adapted to the stage the task was in (already implemented).

1. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?

2. Has the public transport company, as a part of the CIVITAS project, installed 10 ticket vending machines?

Both the table above, C2.3.1, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the possible answers.

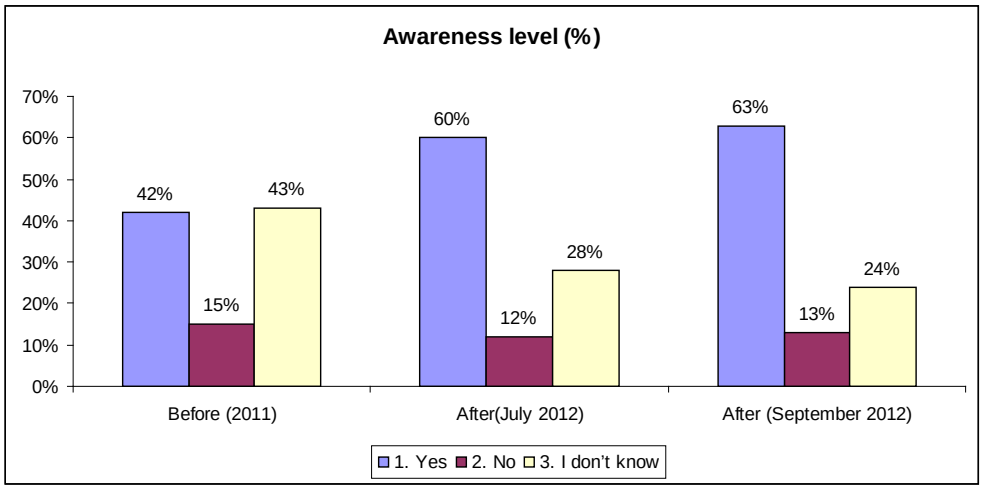


Fig. 6 Awareness level evolution

Fig. 6 shows that the percentage of the respondents who had heard about the tasks implemented through this measure increased from 42% in 2011 to 60% in July 2012 and to 63% in September 2012. The number of those who had not heard about the measure decreased from 43% in 2009 to 28% in July 2012 and to 24% in September 2012.

The awareness level has grown substantially from 42% to 63%, which proves the positive reaction of public transport users to the advantages of the new ticket distribution system. The promotion through different media this project has benefited from over the past four years has also contributed to this positive reaction.

Table C2.3.2 – Acceptance level

Indicator		Before (2011)	After (July 2012)	After (September 2012)
15. Acceptance level (%)	1. total disagreement	3%	1%	1%
	2.	8%	11%	10%
	3.	32%	25%	20%
	4.	27%	25%	29%
	5.total agreement	30%	38%	40%

Indicator		Difference: After (July, 2012) – Before	Difference: After (September, 2012) – Before
Acceptance level (%)	1. total disagreement	-2%	-2%
	2.	3%	2%
	3.	-7%	-12%
	4.	-2%	2%
	5.total agreement	8%	10%

For the assessment of the acceptance level indicator, respondents were asked to answer if they agree to the following:

"Before" situation:
1. the public transport company should improve the ticket distribution system
2. it would be useful to introduce ticket vending machines in stops
3. ticket vending machines should be installed in all stops.

"After" situation:
1. the TVMs have been well-received by people
2. do you prefer to buy tickets from TVMs or from kiosks?
3. TVMs should be installed in all stops

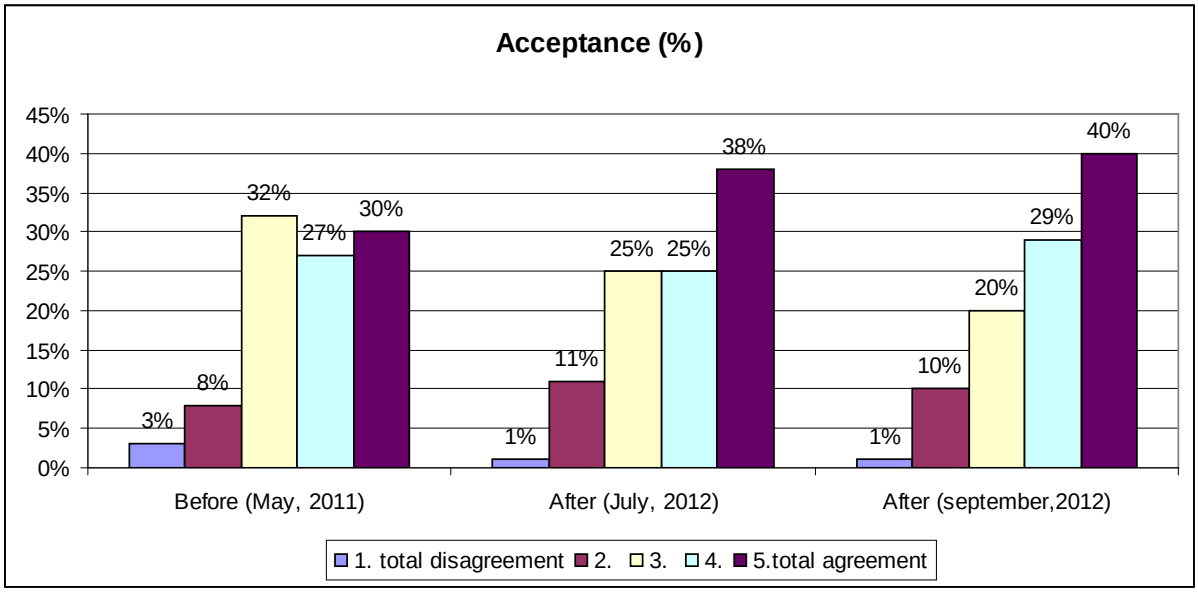


Fig. 7 Acceptance level regarding the improvement of the ticket distribution system

Fig. 7 shows that people were initially quite circumspect about the TVMs (32% were uncertain and 57% agreed with it), but after the measure has been implemented, many began to accept the new system and to use it (points 4 and 5): 63% in July 2012 and 69% in September 2012.

The increase of the acceptance level is also apparent from the number of tickets sold, which increased by 47% in September compared to August.

C2.6 Cost benefit analysis

C2.6.1 Evaluation period for CBA

- Defining reference case for CBA

The reference case corresponds to the BaU scenario, when no investments are made for purchasing 10 TVMs, and tickets are sold through kiosks. The operation costs (which are associated primarily with the labour costs) remain high in this case, and so do the maintenance costs of kiosks. This situation is the same for the "before" data. For details see Section C1.3 – Methods for Business as Usual scenario.

- Defining lifetime of the measure

  The evaluation period is 5 years, which is the equipment lifetime recommended by the supplier.

- Discount rate

  We followed the EU recommendations and used a discount rate of 3.5% for the analysis.

C2.6.2 Method and value for monetisation

- Description of how the impacts are monetised

The main parties involved in this measure and the way they influence its impact are summarised in the following table, which highlights how each influences costs and benefits.

Agents	Costs	Benefits
Public transport operator	Operating costs Maintenance costs	Operating revenues remain constant taking into account the assumed scenario. On comparing the two situations (CIVITAS and BaU), we see that operating and maintenance costs decrease with the replacing of kiosks with TVMs.
Local authorities	Investment (capital) costs	More attractive public transport system
Public transport users		Quality of public transport service(1) Reduced queuing time for public transport users (in purchasing tickets) (2)

(1) Difficult to assess: omitted. (2) Difficult to assess: omitted.

- References of values used

The values of the economic indicators in the base year, used for the cost-benefit analysis have been calculated above, and are summarised in the following table (Table 9):

Indicator (Year 1)	BaU	After
Capital costs	0	110,340 Euro
Operating costs	108,414 Euro	10,320 Euro
Maintenance costs	2,116 Euro	1,530 Euro
Operating revenues	394,320 Euro	394,320 Euro

Table 9 Indicators used in the CBA

These annual values of the economic indicators are updated with the annual inflation rate for energy, fuel, urban transport, railway transport, etc. This rate is published by INS (the National Institute of Statistics) for 2011. The forecasting for 2012-2014 was made by BNR (the National Bank of Romania). Our estimation for the period 20015-2016 has not been mentioned in the public sources of BNR yet (Table 10).

	INS	BNR	Our estimations

Annual inflation rate	2011	2012	2013	2014	2015	2016
	5.79%	5.32%	6.89%	6.60%	6.60%	6.60%

Table 10 The annual evolution of the inflation rate

There are two risks that the forecasting above implies: the annual inflation rate for 2012-2016 may not be accurate, which affects all economic indicators, and, moreover, in the case of the operating revenues, the number of tickets sold each month may have not been predicted correctly.

C2.6.3 Lifetime cost and benefit

Capital cost

- CIVITAS measure: the analysis takes into account the costs of purchasing 10 TVMs and those for training the maintenance and the operating personnel.
- Reference case: the costs are zero because this situation corresponds to the case where no investments were made into the improvement of the ticket distribution system (no TVMs were introduced).

Table C2.6.1 Capital cost in the evaluation period (not discounted)

	Cases for comparison	Cost (euro)
Year 1	CIVITAS measure	110,340
	Reference case (or BAU)	0
Year 2	CIVITAS measure	0
	Reference case (or BAU)	0
Year 3	CIVITAS measure	0
	Reference case (or BAU)	0
Year 4	CIVITAS measure	0
	Reference case (or BAU)	0
Year 5	CIVITAS measure	0
	Reference case (or BAU)	0

Operating costs

- CIVITAS measure: the annual operating costs of the 10 TVMs are included: utilities, paper for printing tickets, data transfer costs, and labour costs (the employee who changes the safe deposit box of TVMs).
- Reference case: the annual operating costs of the 10 kiosks that were replaced by TVMs are included: utilities, paper for printing tickets, and labour costs (ticket sellers).

Table C2.6.2 Operation cost in the evaluation period (not discounted)

	Cases for comparison	Values (euro)
Year 1	CIVITAS measure	10,320
	Reference case (or BAU)	108,414
Year 2	CIVITAS measure	10,869
	Reference case (or BAU)	114,181
Year 3	CIVITAS measure	11,618
	Reference case (or BAU)	122,048
Year 4	CIVITAS measure	12,385
	Reference case (or BAU)	130,103
Year 5	CIVITAS measure	13,202
	Reference case (or BAU)	138,690

Maintenance costs

- CIVITAS measure: the maintenance costs are the annual labour costs with the maintenance team in charge with the TVMs.
- Reference case: these costs are the amount spent for the annual maintenance operations performed on the 10 kiosks that were replaced by TVMs.

Table C2.6.3 Maintenance cost in the evaluation period (not discounted)

	Cases for comparison	**Values** (euro)
Year 1	CIVITAS measure	1,530
	Reference case (or BAU)	2,116
Year 2	CIVITAS measure	1,611
	Reference case (or BAU)	2,228
Year 3	CIVITAS measure	1,722
	Reference case (or BAU)	2,382
Year 4	CIVITAS measure	1,836
	Reference case (or BAU)	2,539
Year 5	CIVITAS measure	1,957
	Reference case (or BAU)	2,707

Operating revenues

- CIVITAS measure: the operating revenues are the estimated annual returns from selling tickets through the 10 TVMs (the monthly average values from the four months of operation were extrapolated to the whole year)
- Reference case: the operating revenues are the annual returns from selling tickets through the 10 kiosks that were replaced by TVMs.

Table C2.6.4 Revenue in the evaluation period (not discounted)

	Cases for comparison	Values (euro)
Year 1	CIVITAS measure	394,320
	Reference case (or BAU)	394,320
Year 2	CIVITAS measure	415,298
	Reference case (or BAU)	415,298
Year 3	CIVITAS measure	443,912
	Reference case (or BAU)	443,912
Year 4	CIVITAS measure	473,210
	Reference case (or BAU)	473,210
Year 5	CIVITAS measure	504,442
	Reference case (or BAU)	504,442

C2.6.4 Comparison between lifetime costs and benefits

Table C2.6.10 Lifetime cost/benefit of the CIVITAS measure (discounted)

	Capital cost (€)	Operation cost (€)	Maintenance cost (€)	Revenue (€)	Total cost (€)	Total Benefit (€)	Cumulated Cost (€)
Year 1	110,340	10,320	1,530	394,320	122,190	394,320	-272,130
Year 2	0	10,501	1,557	401,254	12,058	401,254	-389,196
Year 3	0	10,846	1,608	414,396	12,454	414,396	-401,942
Year 4	0	11,171	1,656	426,808	12,827	426,808	-413,981
Year 5	0	11,505	1,705	439,592	13,210	439,592	-426,382
Total	110,340	54,343	8,056	2,076,371	172,739	2,076,371	-1,903,632

Table C2.6.11 Lifetime cost/benefit of the reference measure/case (discounted)

	Capital cost (€)	Operation cost (€)	Maintenance cost (€)	Revenue (€)	Total cost (€)	Total Benefit (€)	Cumulated cost (€)
Year 1	0	108,414	2,116	394,320	110,530	394,320	-283,790
Year 2	0	110,320	2,228	401,254	112,548	401,254	-288,706
Year 3	0	113,933	2,382	414,396	116,315	414,396	-298,081
Year 4	0	117,345	2,539	426,808	119,884	426,808	-306,924
Year 5	0	120,860	2,707	439,592	123,567	439,592	-316,025
Total	0	570,872	11,972	2,076,371	582,844	2,076,371	-1,493,527

C2.6.5 Summary of CBA results

For the summary of CBA results the changes in benefits and costs between the two scenarios are assessed.

Discounted cash flow

	Changes in total cost (€)	Changes in total benefit (€)	Net cash flow (€)	Cumulative cash flow (€)
Year 1	110,340	98,680	-11,660	-11,660
Year 2	0	100,414	100,414	88,754
Year 3	0	103,704	103,704	192,458
Year 4	0	106,809	106,809	299,267
Year 5	0	110,009	110,009	409,276
Total	110,340	519,616		

Changes in NPV (€): 409,276

This value of the NPV, together with the benefit-cost ratio (BCR = 4,7 – much greater than 1) prove that the benefits of the implementation of this measure are much greater than the initial capital costs and of the operating / maintenance costs, if we assume the hypotheses of the BaU scenario.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	Installation of 10 TVMs	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

C4 Upscaling of results

The installation of 10 TVMs can be extended to other potential areas in the city. This implies investments in equipment, in training the staff to operate and to maintain these systems and in information campaigns to teach passengers how to use them.

The passengers who travel along the CIVITAS corridor and those travelling on the routes which intersect a segment of the corridor benefit from the advantages of this measure. By interviewing the passengers who occasionally use the public transport vehicles running along this corridor, we will be able to evaluate the citizens' acceptance level and depending on the results we could extend this measure to other areas of the city.

C5 Appraisal of evaluation approach

For the cost-benefit analysis we had to make several assumptions because the measure has been implemented relatively recently and we were not able to get reliable data for the "after" situation. The

assumptions were based on the ascending trend of tickets sold. However, one cannot know how realistic it was to extrapolate the results to the entire year 2012, the same one cannot know the exact number of one-trip and two-trip tickets that will be sold through TVMs.

C6 Summary of evaluation results

The key results are as follows:

- the results of the surveys showed that, after the measure implementation, the number of respondents who were satisfied with the new ticket distribution system (points 1 and 2) increased from 10% in 2011 to 18% in July 2012 and to 25% in September 2012, while the number of the undecided has stayed almost at the same level: 39%.

- for assessing the awareness level, the fact that this project started four years ago and that it has benefited from extensive propagation through the media lead to a high awareness level and a corresponding ascending trend: 42% in 2011 and 63% in September 2012.

- as for the acceptance level, people were rather circumspect about this new system in the beginning (32% of the respondents were undecided in 2011), but after the implementation of the measure this percent dropped to 20% in September 2012, while the percent of the respondents who agree with this ticket distribution system (points 4 and 5) increased from 57% in 2011 to 69% in September 2012.

Another very important result of the evaluation is the decrease of the operating costs with about 90% after kiosks have been replaced with TVMs: from 102,480 euro in 2011 to 10,320 euro in 2012, which has lead to an NPV of 409,276 euro.

C7 Future activities relating to the measure

Given the utility of these equipments and their contribution to increasing passengers' comfort, Iasi plans to extend the implementation of this measure by installing more TVMs in various areas of the city, while keeping the same main criteria for choosing their future locations.

The measure will be evaluated based on the questionnaires by face-to-face interviews which will be addressed to public transport users on the CIVITAS corridor. They will be asked questions regarding the awareness, acceptance and quality of service levels.

D Process Evaluation Findings

D.0 Focused measure

	0	No focussed measure
2	1	Most important reason
3	2	Second most important reason
4	3	Third most important reason

D1 Deviations from the original plan

Initially, in the DoW Measure 12 was about installing 225 ticket validation machines in 75 means of public transport. This measure was interconnected from a technical viewpoint to Measure IAS 13, whose first designation was "Real-time information panels", and with Measure IAS 76, Bus management system. In order to ensure the compatibility of the three systems a single tender was organised in order to get a coherent system composed of three subsystems. The tender was cancelled four times because the legislation was changed twice, and this led to a modification of the procedure documentation.

Consequently, the European Commission was asked to change measure IAS12 so that 10 TVMs could be installed along the CIVITAS corridor instead of the 225 ticket validation machines. This proposal was accepted by the EC, hence the whole evaluation procedure had to be changed in order to adapt it to the new measure IAS12.

D2 Barriers, drivers and activities

D2.1 Barriers

Preparation phase

- **6. Positional and 9. Financial:** There were no companies in Romania with experience in developing modern ticket vending machines, and there was a high degree of probability that the price requested by foreign companies would be too high.
- **6. Positional:** There were no transport companies in Romania to share their experience with the public transport company of Iasi because none had modern TVMs.

Implementation phase

- **4. Problem related:** Keeping the balance between the simplicity of the user interface and the functional complexity of the application was often not easy.
- **6. Positional:** Finding a partner bank for implementing the payment by card has proven difficult.

Operation phase

- **10. Technological:** Like with any new software product which, furthermore, has to communicate perfectly with the hardware, improvements were necessary also after the TVMs have been put in place. Although they had been intensively tested prior to installation, the operation in "real-life" environment revealed that some improvements were still needed.
- **3. Cultural:** There are two categories of people who can damage such machines or at least cause malfunctions which, though not difficult to remediate, mean temporary interruption of operation: those who make this on purpose and those who simply do not know how to use the TVMs properly because they have never used such machines and because they do not pay attention to the instructions available.

D2.2 Drivers

Preparation phase

- **5. Involvement, communication:** The requests for TVMs coming from young people in Iasi had become more and more frequent, which added to the conclusion of the public transport company that these devices were necessary for the reduction of expenses and for offering better services to public transport users.

Implementation phase

- **5. Involvement, communication:** The people assigned to this project from the company who won the tender were very easy to work with; they implemented everything they were asked and had essential contributions to improving the project.
- **8. Organizational:** Although there were no transport companies in Romania to help the one in Iasi with their experience, some of the employees of the transport company in Iasi already had experience with such devices from other European countries, and they used it in conceiving the functionality of the TVMs for Iasi: both for the user interface, as well as for the back-office application.

Operation phase

- **5. Involvement, communication:** The reaction of the press, of people who began using the TVMs and of simple passers-by was positive – this made the TVMs even more popular, having the effect of a parallel campaign in their favour to that of the transport company.

D.2.3 Activities

Preparation phase

- **7. Planning:** In parallel with the elaboration of the tender documentation, a more detailed specification on the software applications was drafted in order to save time during the implementation phase.

Implementation phase

- **10. Technological:** The software company who won the tender and the public transport company collaborated intensively for the software development. Once the first version of the software was available, the representatives of the transport company began to test the product and the developers continued to implement the beneficiary's requests and, on the other hand, to solve the issues found by the testers.
- **4. Problem related:** Once a partner bank has been found, the three parties – representatives of the transport company, the software company and the bank – got together, identified the issues they had to concentrate on in order to implement the payment with credit cards, and a close collaboration between the software company and the bank began.

Operation phase

- **10. Technological:** The software company reacted very promptly to the issues that appeared after the TVMs were installed and solved them immediately they were reported. Moreover, the software company supervised continuously the TVMs remotely, in parallel with the persons in charge from the transport company in order to make sure the software was stable.
- **10. Technological:** The persons in charge with the maintenance of the TVMs monitor them throughout the operation hours of the means of transport and intervene when needed.

D3 Participation of stakeholders

D3.1 Measure Partners

- **City of Iasi (Leading Role)**

- responsible with preparing the documentation, the tender and for signing the contract for Ticket Vending Machines.
- responsible with organising meetings with the public transport company for choosing together where to install the TVMs

- **Supplying Company (Principle participant)**
  - responsible with delivering the TVMs
  - responsible with organising meetings with the public transport company for the installation of the TVMs
  - responsible with organising training sessions with employees of the public transport company's in order to instruct them about the maintenance of the TVMs

- **The public transport company (Occasional participant)**
  - responsible with choosing the bus stops where the TVMs were installed
  - responsible with the technical support for installing and putting the TVMs into operation (connection to feeder and to the internet)
  - has participated in training sessions for learning the maintenance operations
  - responsible with collecting all indicators to assess the impact of the measure

- **Technical University Iasi (Occasional participant)** – participated in organising surveys and face-to-face interviews for the assessment of the measure.

D3.2 Stakeholders

- **Passengers** – all citizens travelling by public means of transport, who now can buy tickets with cash or credit card at any time.

- **Media** – the articles in written press may contribute to easier acceptance of TVMs among passengers.

- **The public transport company** – even though it has the role of a partner, the implementation of this measure has brought a huge gain in image thanks to the modernisation of the ticket distribution system.

- **Ticket sellers** – a part of the public transport company's personnel who sells tickets is against this measure, since it means that they are going to lose their jobs.

- **Tourists** – they can now buy tickets easier because they can select the English language for the text displayed on the TVMs.

D4 Recommendations

D.4.1 Recommendations: measure replication

- **Accessibility**. This measure can be successfully replicated in other cities of the European Union because it provides a high degree of accessibility for passengers (non-stop operation and possibility of paying by credit card).
- **Cost reduction**. Another advantage which makes this measure have a high potential of transferability is that such a ticket distribution system reduces the operating costs by eliminating from the calculation the salary of ticket sellers and the energy costs (the amount of energy used for one kiosk is much greater than that for a TVM)

- **High capital costs**. A possible hindrance of replicating the measure in other cities is the cost of a TVM. Therefore an analysis should be carried out before TVMs are purchased in order to know how many can be afforded.

D.4.2 Recommendations: process

- **Location**. The TVMs should be installed there where the demand for tickets is high during the whole day. Furthermore, the TVMs should not be placed in low-visibility places and in poorly-lit locations, in order to avoid vandalism.

- **Easy-to-use interface**. The interface of the TVMs has to be very intuitive. Thus at least some of the users will get easier over the fact that these are new and unfamiliar devices.

- **Helping people to use the TVMs**. Trained personnel of the public transport company should show people at the beginning how to use the TVMs. This requires not only very good knowledge of its functions, but also very much patience from the part of the personnel.

- **Training for maintenance operations**. The knowledge acquired regarding maintenance of TVMs is very important because the time they are out of service is directly proportional to the cost of tickets that could have been sold, which negatively affects the success of the measure.

ANNEX 1

The TVM system follows a client-server model (See Fig. A1).

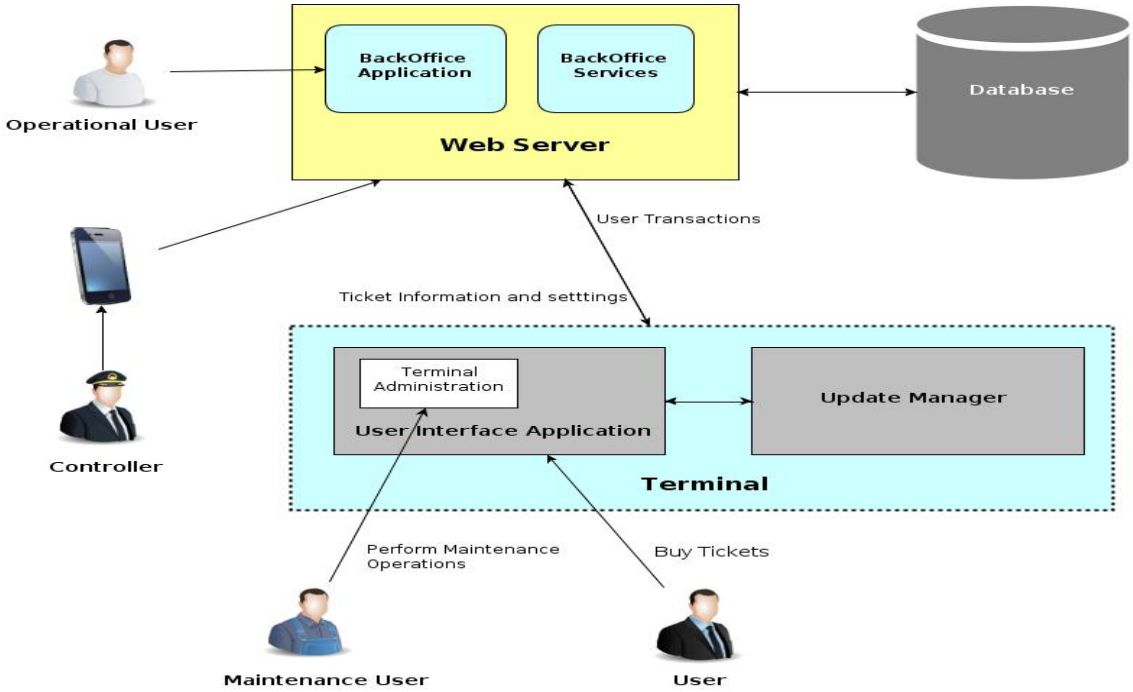


Fig. A1 High Level Architecture Diagram

The components of the system that interact are (See Fig. A2):

1. User Interface Application – this contains the logic for processing the user input and for communicating with the server
2. Update Manager – a Watchdog for the User Interface Application and the Hardware abstraction layer services, who ensures their accurate operation and, if needed, their update.
3. Hardware Abstraction Layer – Local services that ensure the communication between the User Interface Application and the hardware modules (printer, bill acceptor, coin acceptor, coin dispenser)

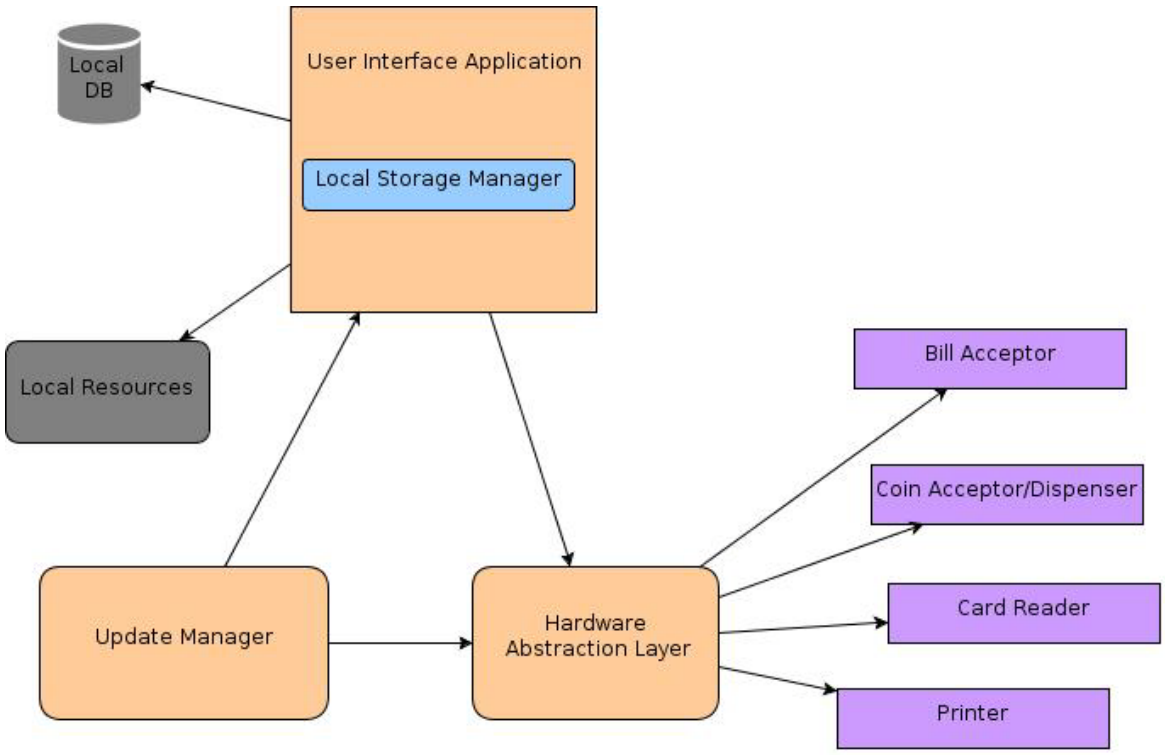


Fig. A2 The interaction between system components

The **user interface application** follows the View-Model design pattern, each view having its own View-Model from which it gets its data (See Fig. A3).

The user interface application is composed of the following modules:

1. Main Applications – the starting point of the terminal application. This starts the other components of the application.

2. Controls – the view of the application. The controls use the View-Model modules as their data context, presenting them to the user.

3. Themes – various styles that apply to the components in the view.

4. Common – common components of the terminal application. These components are used for enabling the communication with the Server and with the hardware services hosted within the terminal, as well as other data parsing and data processing (localization, string formatting, etc.)

5. Resources – a library that contains the static localization resources of the application. It contains the dictionaries available for various languages supported by the application.

6. QR Generator – a library used to generate the QR code that is being printed on the season tickets.

7. Local Storage – a library that provides access to the local database (allowing CRUD operation on various entities).

8. View-Models – contains the data that will be presented to the user in the View (Controls) component.

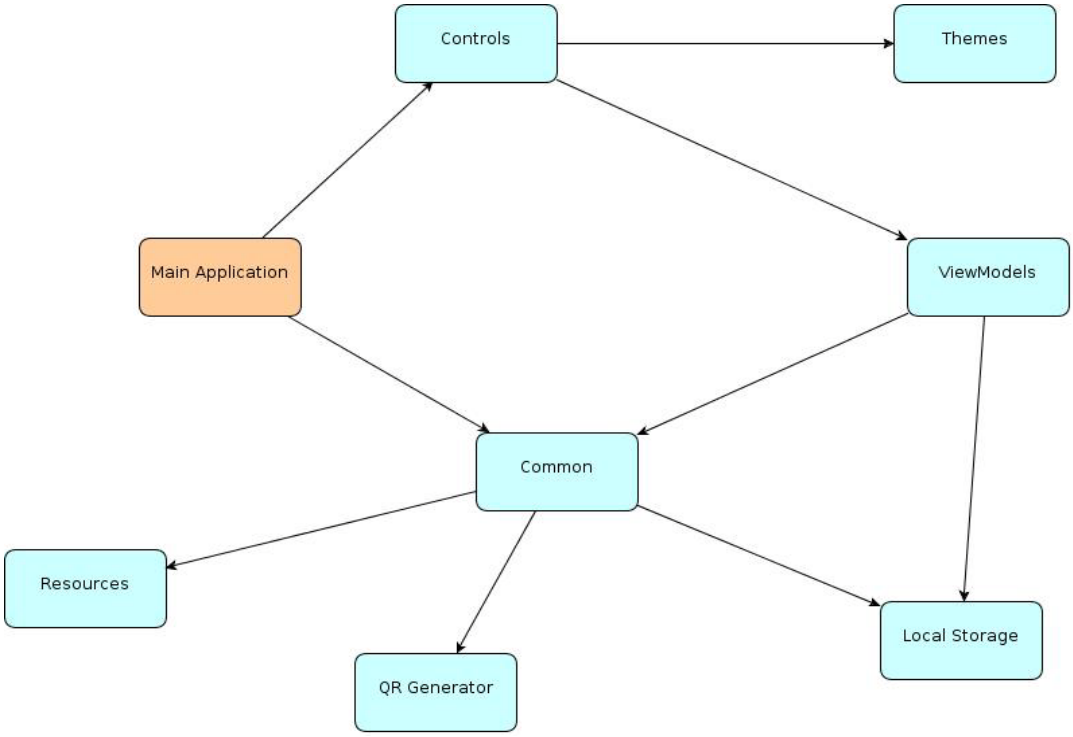


Fig. A3 User interface application modules

The **client-server communication** is realised through two WCF services exposed by the server (See Fig. A4):

1. Device Service
   - the service manages the communication regarding most of the interaction between the server and the client. It includes operations like:
     i. Ping() – tests if the server is alive
     ii. GetSettings() – gets the latest settings from the server (like available tickets and season tickets, various UI values: popup timeouts, change receipt threshold, ping interval etc). The terminal application will not run until these settings are brought from the server
     iii. SaveTickets() – sends the bought tickets and season tickets to the server
2. Streaming Service
   - the streaming service allows the terminals to download the newly added/changed media files (images, movies), as well as the updates for the application binaries. It includes operations like:
     i. DownloadUpdates() – gets the latest main application updates. This is performed by the UpdateManager
     ii. DownloadMediaFiles() – gets the various media files that have been added or changed since the last update

Internally, the User Interface application and the Update Manager communicate through a service exposed by the User Interface application which has the following methods exposed:

- IsAlive() – tests if the UI App is alive, and, if not, it performs a restart
- SendCommand() – sends various commands to the UI App like restart, GetStatus etc.

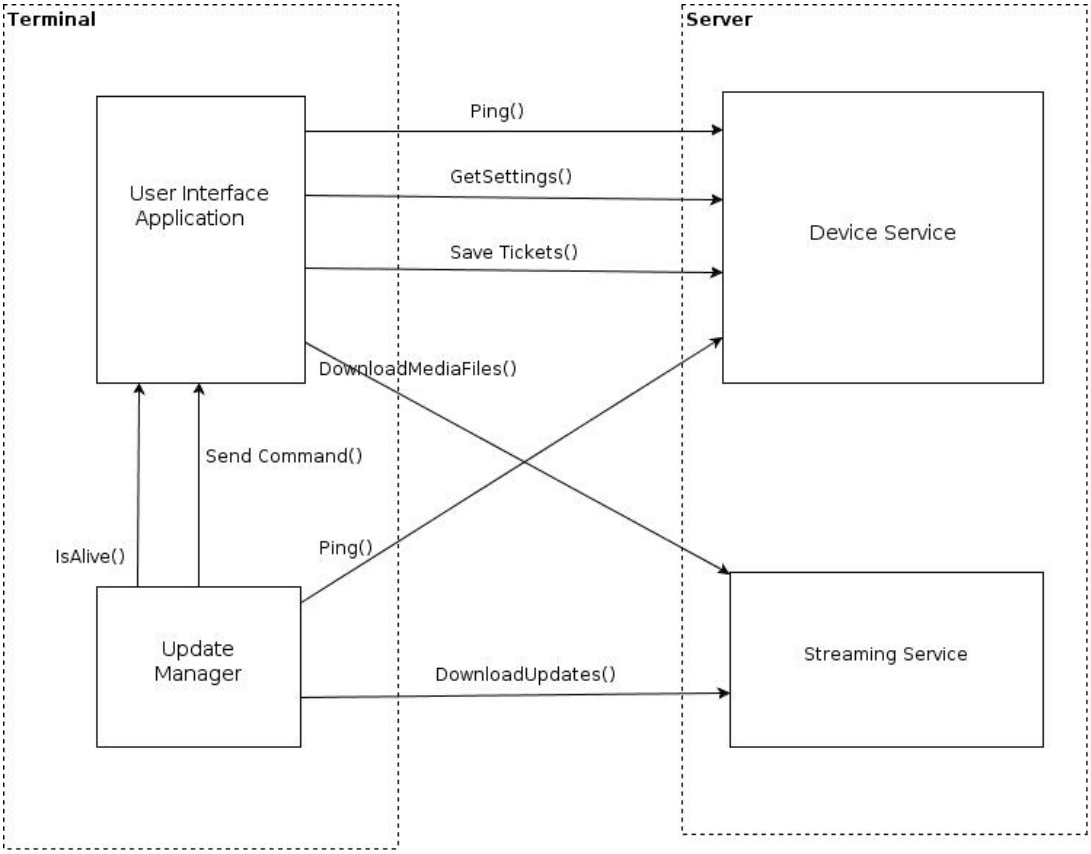


Fig. A4 Client-Server Communication diagram

The **server system** (See Fig. A5) exposes 3 main web applications that interact with an SQL Server 2008 database and with the client applications:

1. WCF Service that exposes methods for client applications and provides access to the database.
2. WCF Service that exposes functionality for the Back office application and provides access to the database.
3. ASP.NET Website that exposes functionality for managing devices, ticket types, changing settings and generating reports.

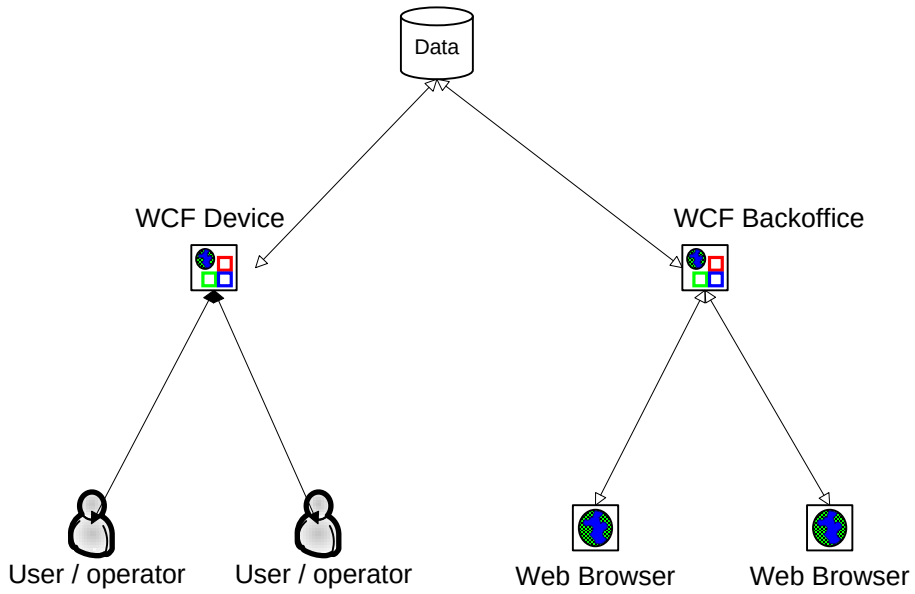


Fig. A5 Server System diagram

The client application is the interface between the users (buyers) and the server system that exposes the functionality. The functionality is provided by a **WCF service** that receives the requests from the client applications, processes the request based on the type of request and the parameters provided and sends the response back to the client application.

This service has the following main functions: it

1. authenticates clients (devices)
2. provides the settings and the multimedia content to client applications
3. records the activity of the devices and the events that may occur (i.e. shock detection, lack of resources like paper, etc)
4. provides support for transactions (buying tickets)
5. sends automatic / manual commands to individual devices

The **Back office application** (Fig. A6 and A7) provides functionality for qualified personnel to manage the settings under which the system will perform.

The main functions are to:

1. create new users and assign roles
2. manage (register) devices
3. create ticket types and activate / deactivate them
4. create tokens for discounted tickets
5. manage change receipts (receipts that can be use at a later time to pay for tickets)
6. grant support for multiple languages for client side application
7. grant support for automatic updates of client applications
8. grant support for defining/sending multimedia files to clients
9. generate device status reports
10. generate reports that show the activity recorded on the clients' side like money income, the quantity of tickets sold in a certain interval of time, etc.

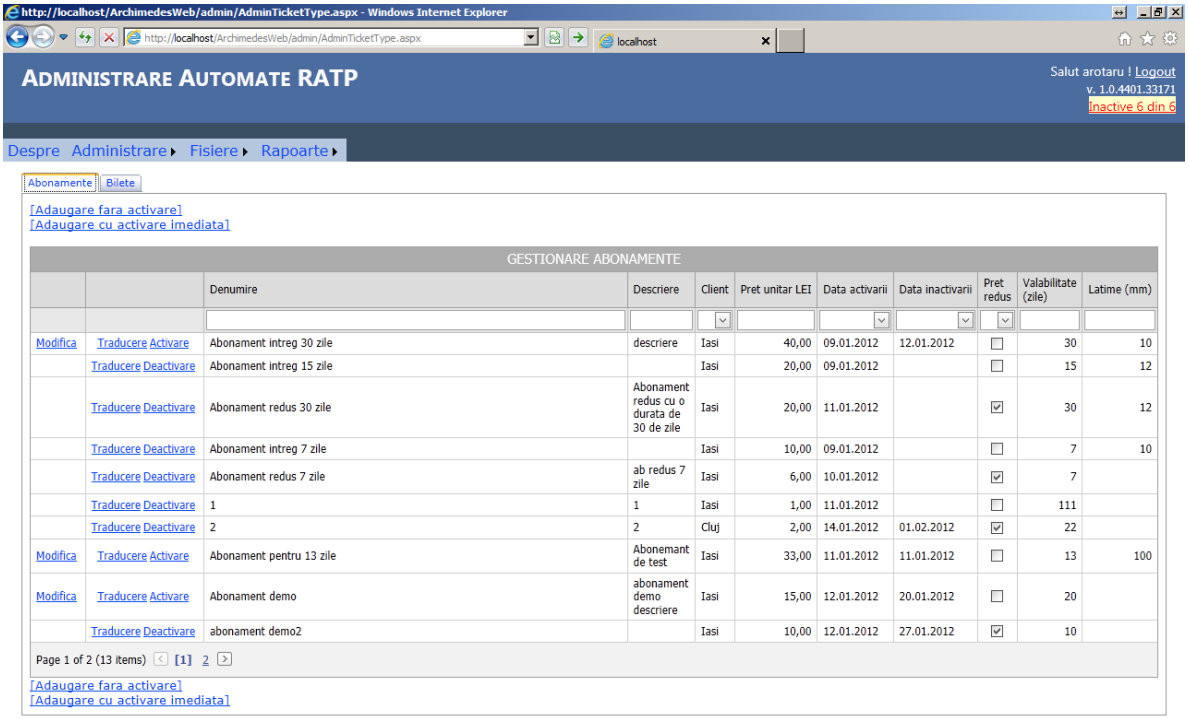


Fig. A6 Back office application

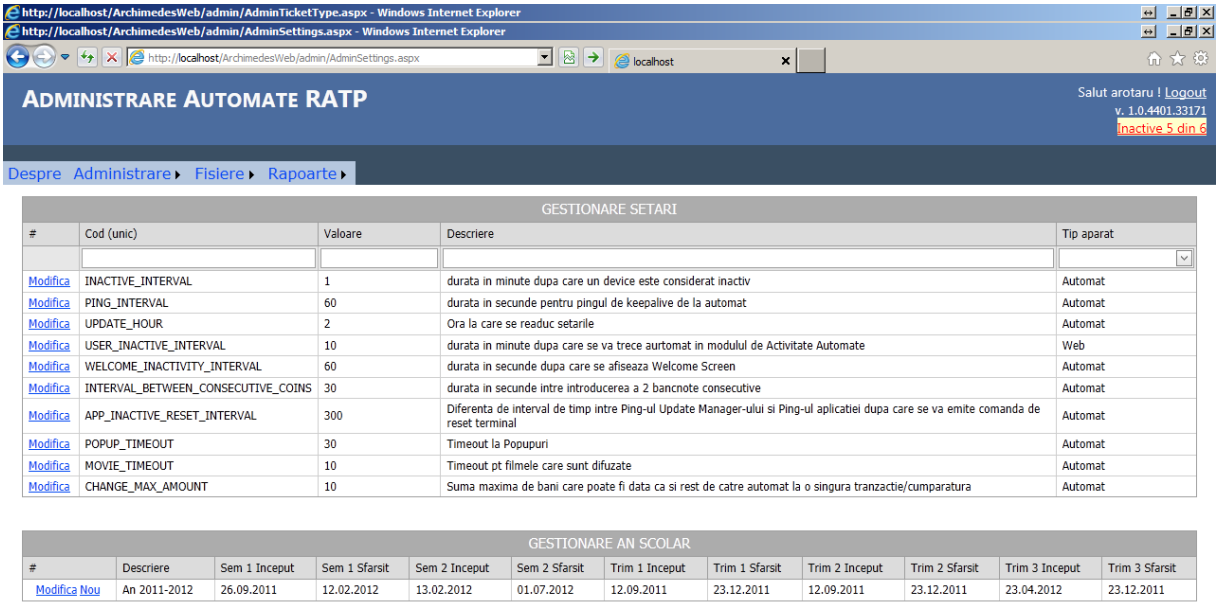


Fig. A7: Back office application

ANNEX 2

Example of press reactions.

http://www.agendadeiasi.ro/arhiva/19520-primaria-a-cumparat-10-automate-de-vanzare-a-biletelor-ratp.html

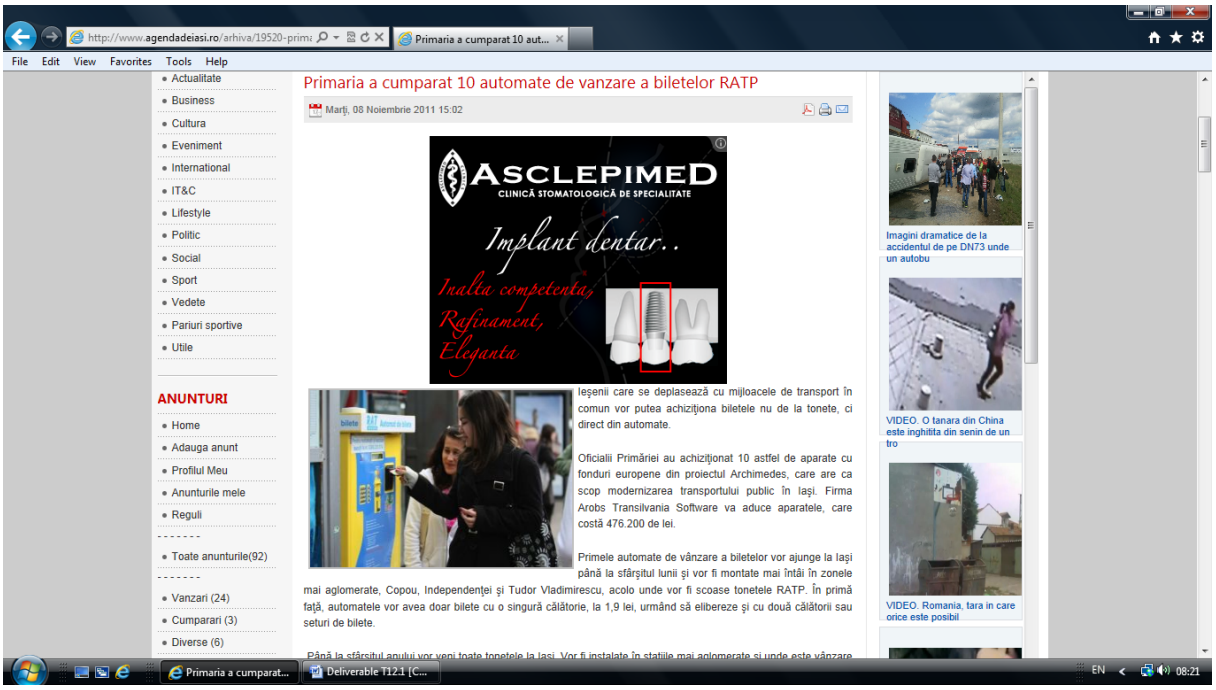


Fig. A8 Article announcing that the 10 TVMs were going to be installed

http://www.evenimentul.ro/articol/automatele-de-bilete-ratp-functionale-din-februarie.html

Fig. A9 Article announcing that the 10 TVMs were going to be installed

http://newsiasi.ro/eveniment/actualitate/349-10-automate-pentru-bilete-ratp-pe-traseul-tudor-vladimirescu-copou.html

Fig. A10 Article announcing that the 10 TVMs were going to be installed

http://www.ziare.com/ziare-iasi/stiri-business/primul-automat-de-bilete-ratp-functional-in-mai-putin-de-o-luna-2905321

Fig. A11 Article announcing that the 10 TVMs were going to be installed

http://oradeiasi.oradestiri.ro/in-loc-de-tonete-ratp-iasul-va-avea-de-azi-automate-de-bilete-pentru-mijloacele-de-transport-in-comun-vezi-unde-sunt-amplasate-acestea/actualitate/2012/05/03/

Fig. A12 Article announcing that the 10 TVMs were going to be put into operation

http://www.cronicadeiasi.ro/stiri/locale/Incepand-de-astazi-iesenii-isi-vor-putea-cumpara-bilete-de-autobuz-direct-de-la-automate-VIDEO/19553

Fig. A13 Article announcing that the 10 TVMs were going to be put into operation

ANNEX 3

Questionnaire – after situation

M.12 - Improved ticketing system

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket
   □ set of 10 trips □ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____
7. The public transport company sells the following types of tickets:
   □ one-trip ticket □ two-trip tickets □ season tickets □ travel cards
8. Season tickets for school and university students who use public transport in Iasi have reduced fares
   □ yes □ no □ I don't know
9. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know
10. Has the public transport company, as a part of the CIVITAS project, installed 10 ticket vending machines?
    □ yes □ no □ I don't know
11. To what extent do you agree with the following statements (with a grade from 1 to 5, where 1 has the meaning "total disagreement" and 5 "total agreement")

The TVMs have proved successful among citizens.	1 2 3 4 5
You prefer buying tickets rather from TVMs than from kiosks.	1 2 3 4 5
TVMs should be installed in all stops.	1 2 3 4 5

12. To what extent are you satisfied with the following aspects of the public transport services?

	very satisfied	satisfied	almost satisfied	dissatisfied	very dissatisfied
The improvement of the ticket distribution system.	□	□	□	□	□
The ticket vending machines that have been installed.	□	□	□	□	□
The degree of accessibility of the TVMs (from the point of view of location and operating times).	□	□	□	□	□

13. Do you have any suggestions for improving the release / marking of the travel tickets for public transportation? – list (no coding)

Thank you!

ANNEX 4

Reports on tickets sold at the TVM in the stop "Moldova Mall" in June-September 2012

Raport incasari pe automate

Data generarii / generat de: 09.10.2012 09:53:33 / Olariu Radu

Intervalul selectat: 01.06.2012 00:00:00 - 30.06.2012 23:59:59

Automat	Tip legitimatie	Pret unitar	Nr. legitimatii vandute	Incasari
Automat MOLDOVA	Bilet 2 călătorii	3,70	976	3611,20 lei
	Bilet 1 călătorie	1,90	1901	3611,90 lei
	Total pe aparat			**7223,10 lei**
	Total incasari			**7223,10 lei**

Fig. A14 Report on tickets sold in June 2012

Raport incasari pe automate

Data generarii / generat de: 09.10.2012 09:54:00 / Olariu Radu

Intervalul selectat: 01.07.2012 00:00:00 - 31.07.2012 23:59:59

Automat	Tip legitimatie	Pret unitar	Nr. legitimatii vandute	Incasari
Automat MOLDOVA	Bilet 2 călătorii	3,70	1436	5313,20 lei
	Bilet 1 călătorie	1,90	2439	4634,10 lei
	Total pe aparat			**9947,30 lei**
	Total incasari			**9947,30 lei**

Fig. A15 Report on tickets sold in July 2012

Raport incasari pe automate

Data generarii / generat de: 09.10.2012 09:54:25 / Olariu Radu

Intervalul selectat: 01.08.2012 00:00:00 - 31.08.2012 23:59:59

Automat	Tip legitimatie	Pret unitar	Nr. legitimatii vandute	Incasari
Automat MOLDOVA	Bilet 2 călătorii	3,70	1433	5302,10 lei
	Bilet 1 călătorie	1,90	2238	4252,20 lei
	Total pe aparat			**9554,30 lei**
	Total incasari			**9554,30 lei**

Fig. A16 Report on tickets sold in August 2012

Raport incasari pe automate

Data generarii / generat de: 09.10.2012 09:54:50 / Olariu Radu

Intervalul selectat: 01.09.2012 00:00:00 - 30.09.2012 23:59:59

Automat	Tip legitimatie	Pret unitar	Nr. legitimatii vandute	Incasari
Automat MOLDOVA	Bilet 2 călătorii	3,70	2026	7496,20 lei
	Bilet 1 călătorie	1,90	3370	6403,00 lei
	Total pe aparat			**13899,20 lei**
	Total incasari			**13899,20 lei**

Fig. A17 Report on tickets sold in September 2012

Raport incasari pe automate

Data generarii / generat de: 09.10.2012 09:51:53 / Olariu Radu

Intervalul selectat: 01.06.2012 00:00:00 - 30.09.2012 23:59:59

Automat	Tip legitimatie	Pret unitar	Nr. legitimatii vandute	Incasari
Automat MOLDOVA	Bilet 2 călătorii	3,70	5871	21722,70 lei
	Bilet 1 călătorie	1,90	9948	18901,20 lei
	Total pe aparat			**40623,90 lei**
	Total incasari			**40623,90 lei**

Fig. A18 Report on tickets sold in June-September 2012

Executive summary

The Municipality of Iasi together with the public transport company decided to improve the security of passengers and that of bus and tram drivers by implementing a video surveillance system to monitor public means of transport. Video cameras were mounted in 100 trams and buses. The images captured are stored locally and passengers are shown periodically on LCD screens real-time images from within the vehicles. The personnel in the monitoring centre can also watch these images in real time.

Several indicators have been monitored for the evaluation of the measure, some of them by means of surveys, others by comparing data provided by the transport operator. The results are as follows:

- the quality of service indicator increased from 10% in 2011 to 16% in September 2012, which shows a slight increase in the respondents' degree of satisfaction with drivers' and ticket inspectors' behaviour towards passengers

- the increase of the awareness level indicator to 49% in September 2012, 14% more than the percentage obtained in 2011, is a consequence of the long period the inhabitants of Iasi have been exposed to this project and of the many related articles that were published in the local press;

- the increase of the respondents' acceptance level by 5% in September 2012 is a sign that part of the interviewees think that this measure was a success;

- the number of complaints has decreased from 318 in 2011 to 216 in 2012; the collision number also decreased, from 151 in 2011 to 144 in 2012;

- the NPV (net present value) has a negative value (-409,276 €), but some of the advantages of the implementation of this video surveillance system could not be monetised, for instance the sense of security experienced by passengers, the improvement of the quality of public transport services, the decrease of the number of crimes committed in the public means of transport as a result of the deterring effect cameras have on potential law breakers.

The following can be regarded as lessons that were learned during the implementation of this measure:

- the tender specifications should request a professional video system, the high quality of which is extremely helpful in certain circumstances;

- during the installation of the system all technical details regarding the way the cameras are installed should be carefully considered

As for the evaluation of this measure, the most important aspect of the implementation of the video surveillance system is the increase of the feeling of security among passengers, which translates into an increase in quality of public transport services.

IAS 13 – Video Surveillance System in Iasi

A Introduction

A1.1Objectives

The measure objectives are:

(A) High level / longer term:
- To improve passengers' psychological comfort.

(B) Strategic level:
- To improve the quality of public transport services by raising passengers' security

(C) Measure level:
- To implement a video surveillance system in 100 public means of transport
- To reduce the number of collisions
- To reduce the number of complaints
- To reduce the time needed for completing investigations of collisions and complaints thanks to video evidence

A1.2Target groups

All passengers who use public transport vehicles equipped with video surveillance system.

A2 Description

Iasi has installed a video surveillance system (VSS) in 36 trams and 64 buses (100 units) from a total of 276 public means of transport which make up the fleet of the public transport company..

Even if buses and trams connected to the video surveillance system do not run on the same route every day, all the lines that transit the CIVITAS corridor are operated exclusively by means of transport equipped with a VSS, whose number satisfies the needs of a normal operation day. Moreover, other areas in the city benefit from the impact of the measure, because there are routes on the CIVITAS corridor that are extended towards the above-mentioned areas

The difficulty to establish the guilty party in an accident in case of contradictory statements of the parties involved is what lead to the necessity of installing such a system. Identifying the guilty party was often difficult and time-consuming. Apart from traffic accidents (416 in 2010), drivers of public means of transport are sometimes involved as aggrieved parties in direct aggression from passengers or other persons. Though far less frequent than they used to be (8 incidents in 2010), they can be violent, and the presence of surveillance cameras prevents potential aggressors from acting.

Not only was the security of drivers affected from the lack of surveillance cameras, but also that of passengers. In the latter case, security refers both to their physical integrity and to the integrity of their belongings.

Another type of violence is manifested upon various parts inside the vehicle. Once passengers have learned that their movements are permanently monitored, the amount of such aggressions has significantly decreased as well.

The video surveillance system consists of (Fig. 1):
- onboard equipment: video cameras (4 pieces in each vehicle), recording and storing device (network video recorder – NVR), LCD display, WiFi and 3G antennas;
- equipment installed in three maintenance facility centres: servers, storage devices, and local management and recording systems.

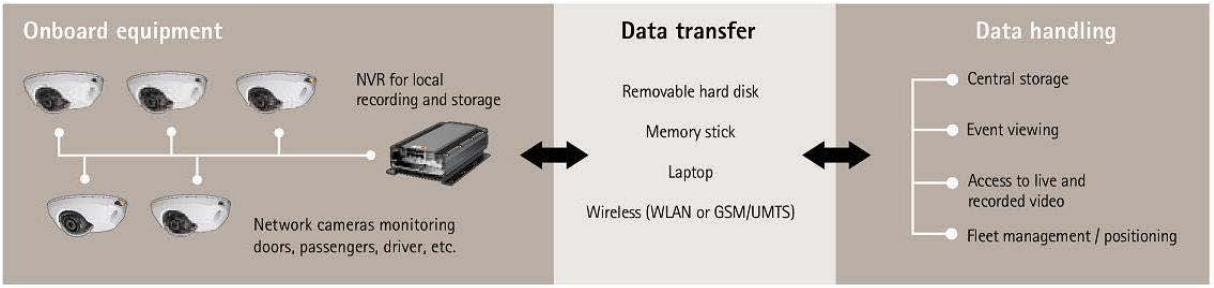


Fig. 1: Data transfer and handling

Three video cameras were installed inside each vehicle in order to record potential incidents between passengers and employees of the transport company (drivers or ticket inspectors) or just among passengers, potential acts of vandalism on the vehicle, thefts, etc. A fourth video camera was mounted in each driver's cabin and oriented towards the exterior so that it can record potential collisions in which the vehicle it is mounted on is involved. These four cameras capture images and send them to a video recorder, which is equipped with a storage hard disk.

The recorders are connected to an LCD screen placed inside the vehicle, which displays images from the cameras, as well as information of public interest.

The video images from the cameras are recorded onboard. When the vehicles are in the depot, the images are transferred wirelessly to two local storage stations, one for buses and one for trams, and then, using the VPN infrastructure, they are forwarded and stored on the hard disks in the main maintenance facility centre.

The video images captured in vehicles can also be watched in real time in all three maintenance facility centres by accessing the GSM interface mounted on the NVR. When an incident – either a collision or an event in a vehicle (inappropriate behaviour of a driver or ticket inspector, altercations among passengers, thefts, acts of vandalism) is announced, a team from a specialised department of the transport company starts an internal investigation in order to determine the circumstances in which the incident occurred and the guilty party/parties. Everything used to be investigated only on the basis of the declarations of the people involved in the incident and of their confrontation. The VSS simplifies and reduces the time of investigation thanks to the availability of video evidence. The police are provided the video evidence when they make a parallel investigation.

The surveillance system is also an efficient tool for the prevention of incidents though the psychological effect the very presence of the system generates.

At the same time, the video camera installed in the cockpit allows the recording of events that take place both in the cabin and in front of the vehicle. This provides the necessary details about the causes of incidents and about the drivers' behaviour. By keeping buses and trams safe and secure, the public transport company also attracts more passengers.

Cameras provide valuable information for investigations of acts of vandalism and other crimes, and also protect the operator from dishonest liability claims. Access to high-quality video is essential for investigations. All recorded video has a resolution of at least 800x600 pixels, which is more than the 2CIF typically offered by analogue systems. Progressive scan technology provides clearer images of moving persons and objects, making it easier to identify individuals, which reduces investigation times. The stored video also provides a clear view of what happened before, during and after an incident.

B. Measure implementation

B1Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – in case of accidents or crimes the video surveillance system serves to facilitate the identification of the guilty party, and is meant to prevent crimes and inappropriate behaviour inside vehicles.
- **Use of new technology/ITS** – the video surveillance system installed on 100 public transport vehicles represents a new technology for the city of Iasi
- **New physical infrastructure solutions** – a closed-circuit infrastructure consisting of cameras, hard disks, LCD screens and video camera energy supply equip 100 public means of transport

B2Research and Technology Development

B3Situation before CIVITAS

Previously there were no such video surveillance systems in the Iasi public means of transport.

From the total of 276 means of transport belonging to the public transport company, 210 vehicles (trams, buses and minibuses) operate in Iasi every working day. None of them were equipped with closed-circuit cameras before the implementation of this measure.

B4Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: (*September-November 2011*) – the tender documentation for video surveillance was prepared and the tender procedure was organised

Stage 2: Contract (*December 2011***)** – a contract was signed with the winner of the tender.

Stage 3: Implementation (December 2011-May 2012) – the video surveillance system was installed on 100 public transport vehicles (36 trams and 64 buses).

The equipment was installed in two steps:

- December 2011 – March 2012: the equipment was implemented in the maintenance facility centres and the video systems in the 36 trams;
- March – May 2012: the video systems were installed in the 64 buses.

The video surveillance system is based on a digital recorder (NVR), which receives and stores digital images from four IP cameras mounted inside the vehicle (cockpit, front, middle, rear) (see Fig. 2).

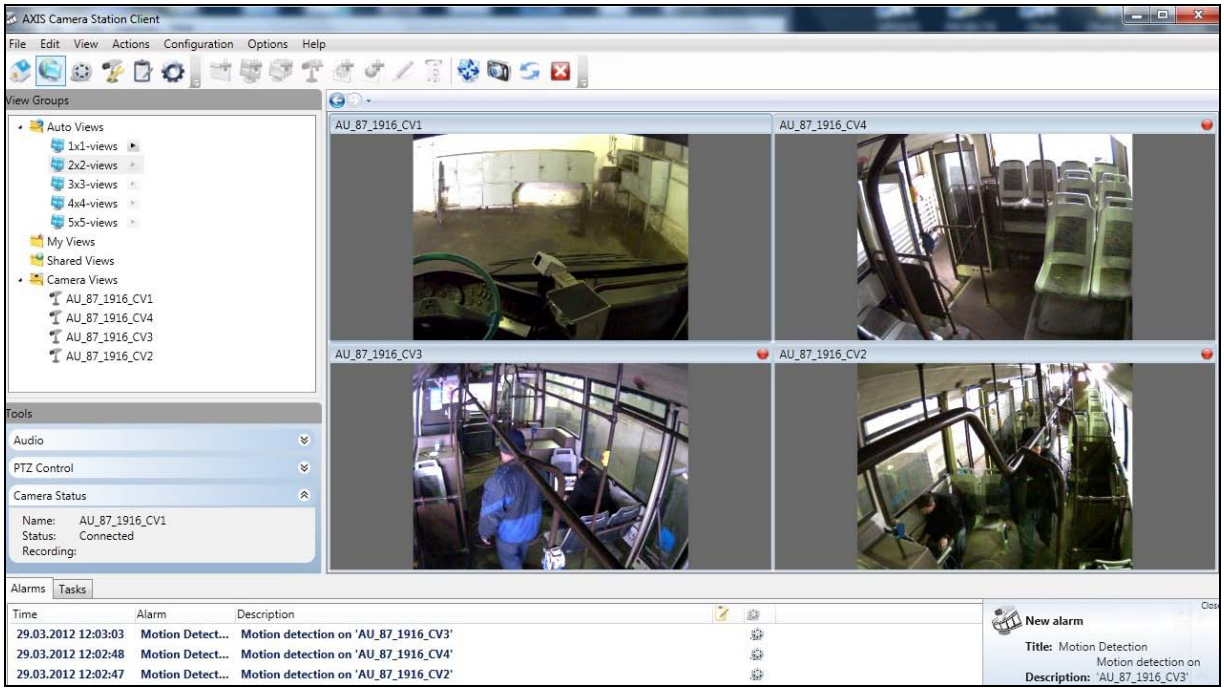


Fig. 2 Axis Camera Station Client – live view – all cameras

Network video surveillance solutions are based on open IP standards. This enables the use of the standard IP network infrastructure instead of proprietary systems and devices, similar to analogue CCTV solutions.

The images can also be seen on the 19" LCD display installed inside the vehicles. These screens are equipped with SD-card players for transmitting commercials, presentation spots, pictures, news, etc.

Technical details about the architecture of the video surveillance system are to be found in Annex 1.

During the implementation of this measure, the public was informed via written press, radio and TV about the role and utility of these systems. Annex 2 includes some of the online articles about the implementation of the video surveying system in public means of transport in Iasi.

Stage 4: Evaluation (before data collection - May 2011, after data collection – July and September 2012) – surveys were organised and data for the assessment of the measure were collected.

B.5 Inter-relationships with other measures

This measure is related to other measures as follows:

- Measure no. IAS 35 – Education and promotion programme and measure no. IAS 76 – Bus Management System

CPlanning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0Scope of the impact

The social impact of this measure results from the fact that the video surveillance system is meant to increase passengers' comfort by offering them a more secure way of travel by public transport vehicles, as it is possible to have access to what is going on inside a vehicle at any time.

Another impact of this measure is related to the image of public transport: the quality of the transport service has increased, which is apparent from the fact that the number of complaints regarding drivers' or ticket inspectors' misbehaviour has decreased.

The existence of video images has an impact also on the costs resulted from the investigations of incidents. These costs decrease because the video evidence reduces investigation time, and the guilty party is thus found faster.

C1.1.1Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
2a	ECONOMY	Costs	Operating Costs	Operating costs	Costs per VSS	euro / VSS
2b			Capital Costs	Capital costs	Costs per VSS	euro / VSS
2c			Maintenance costs	Maintenance costs	Costs per VSS	euro / VSS
13	SOCIETY	Acceptance	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
19	TRANSPORT	Quality of service	Quality of service	Quality of service	Survey	Index (%)
	NEW			Complaints	No. of complaints registered	Counting
	NEW			Collisions	No. of collisions registered	Counting

C1.1.2Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2a	Operating costs	As lower as possible	Operating costs include data transfer costs and the labour costs of the monitoring team	Monthly
2b	Capital costs	438.600 euro	Resulted from the financial offer of the supply company	Once, when the contract is signed
2c	Maintenance costs	-	Maintenance costs include the labour costs of the maintenance team	Monthly
13	Awareness level	Improved	A specific survey was conducted to assess these indicators. The interviews* were carried out by students in a public transport stop during five working days, before and after the measure implementation. 100 persons were interviewed in each wave. Following some details of the survey campaign: **May 2011.** The survey was conducted (using 100 questionnaires) on passengers in the proximity of a public transport stop. In order to assess the awareness level of the inhabitants of Iasi, the respondents were asked if they had heard about the CIVITAS project and if they knew that a video surveillance system had been installed in 100 public transport vehicles as part of this measure. In order to evaluate the acceptance indicator, people were asked if by the installation of video cameras in public means of transport the following aspects would be improved: the behaviour of public means of transport drivers and that of ticket inspectors towards passengers, the behaviour of public means of transport drivers in traffic, etc. For the evaluation of the quality of service indicator, we asked citizens whether they were satisfied about the public transport drivers, the public transport ticket controllers' attitude towards passengers and public transport drivers' behaviour in traffic. **July and September 2012.** Another set of 100 questionnaires was used for face-to-face interviews with citizens in both instances. The survey was conducted in the same place as in 2011. For all these 3 indicators, the same questions were used but they were adapted to the stage the task was in (already implemented).	Before – May 2011 After – July and September 2012
14	Acceptance level	Improved		
19	Quality of service	Improved		
NEW	Complaints	The number of complaints to be significantly lower in the period after the measure is implemented comparing it to the period before implementation	The number of complaints regarding drivers' or ticket inspectors' misbehaviour are recorded, which makes it possible to compare these complaints before and after the implementation of the measure	Before – the whole year 2011 After – August and September 2012 (the data was extrapolated to the entire year 2012)
NEW	Collisions	The number of collisions to be significantly lower in the period after the measure is implemented comparing to the period before implementation	The number of collisions (traffic incidents) involving public means of transport. Thus one can compare the numbers of collisions before and after the implementation of this measure.	Before – the whole year 2010 After – August and September 2012 (the data was extrapolated to the entire year

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
				2012)

* The questionnaire is to be found in ANNEX 3.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	Operating costs	Not applicable	PTI – Dana Cernat
	Capital costs	Not applicable	PTI – Dana Cernat
	Maintenance costs	Not applicable	PTI – Dana Cernat
	Awareness level	M33	TUI
	Acceptance level	M33	TUI
	Quality of service	M33	TUI
	Complaints	M33	PTI
	Collisions	M33	PTI
Collection of after data	Operating costs	July – September 2012	PTI – Dana Cernat
	Capital costs	July – September 2012	PTI – Dana Cernat
	Maintenance costs	July – September 2012	PTI – Dana Cernat
	Awareness level	July and September 2012	TUI
	Acceptance level	July and September 2012	TUI
	Quality of service	July and September 2012	TUI
	Complaints	August and September 2012	PTI
	Collisions	August and September 2012	PTI
D12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 42	
D12.4 Final version of results template available	All indicators	Month 44	

C1.2 Establishing a baseline

For the evaluation process of the video surveillance system we analysed:

–operating costs, which include data transfer costs and the salaries of the monitoring team, were calculated only for the "after" situation because for the "before" situation these are not applicable.
–maintenance costs, which include the salaries of the maintenance team, were calculated only for the "after" situation because for the "before" situation these are not applicable.
–the number of complaints, which result from the data from 2011 provided by the public transport company.
–the number of collisions where also means of public transport were involved. Therefore we used 2010 as baseline, because the number of collisions was relatively constant in the interval 2008-2010 (Table 1).

Year	2008	2009	2010	2011
No. of collisions	446	402	416	290

Table 1 – The annual evolution of the number of collisions

The decrease of the number of collisions in 2011 can be explained by the implementation of Measure 14, Bus Priority Measures, along with other factors at city level. In the period 2010-2012 the number of public means of transport remained constant.

On evaluating the indicators, we transposed the number of annual collisions (416) in the "before" situation to the 100 vehicles equipped with a video surveillance system in order to maintain the basis of comparison with the "after" situation.

–The awareness level, acceptance level and quality of service indicators, which were obtained through surveys, were assessed by comparing the results of these surveys before and after the measure was implemented.

In order to assess the awareness level, the acceptance level and the quality of service, surveys were conducted among the inhabitants of the city of Iasi. The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people) after the measures had been implemented, thus making it possible to compare the results of the "before" and "after" situations. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

The interviews were carried out in the same public transport stop located on the CIVITAS corridor during the three periods the surveys took place in (one before the implementation of the measure and two after). We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole

city (from a geographical and from a demographical viewpoint) because of the small sample size and area of the interviews. However, we have studied through the surveys a demonstration area of impact for a possible upscaling at local or metropolitan level.

C1.3Methods for Business as Usual scenario

In the case of the BaU scenario no investments for purchasing video surveillance system are made. This situation is the same for the before-data.

From the total of 276 means of transport belonging to the public transport company, 210 vehicles (trams, buses and minibuses) operate in Iasi every working day, and an average of 114 a day during weekends. None of them were previously equipped with closed-circuit cameras. This made the process of establishing the guilty party in an accident difficult in case of contradictory statements of the parties involved, which resulted in longer investigations in the absence of cogent evidence.

During the operation of public means of transport, frictions between the employees of the public transport company (drivers, ticket inspectors) and passengers may sometimes occur. They are usually generated by the inadequate attitude of the employees of the transport company towards passengers or vice-versa. Most of the times the offended passenger makes a complaint to the transport company. Time is required for analysing the circumstances in which the event occurred and, when the investigation is over, for contacting the claimant in order to give him or her the answer. The time required for analysing and for answering a complaint is the basis for its monetisation.

In order to anticipate the evolution of the costs resulting from collisions and complaints for the period 2013-2016, the annual rate of inflation was taken into account. The forecasting for 2012-2014 was made by BNR (the National Bank of Romania) by updating the annual values of the economic indicators with the annual inflation rate for energy, fuel, urban transport, railway transport, etc. Our estimation for the period 2015-2016 has not been mentioned within the public sources of BNR yet.

	BNR			**Our estimations**	
Annual inflation rate	2012	2013	2014	2015	2016
	5,.32%	6.89%	6.60%	6.60%	6.60%

Table 2 – the annual evolution of the inflation rate

The risk of the BaU scenario is represented by the dynamics of the evolution of the number of collisions, which is influenced by different elements that are not necessarily in connection to how the public means of transport involved in collisions are driven, but to traffic conditions in general and to the behaviour of the other participants in traffic in particular. The same risk is valid for the case of complaints.

C2 Measure results

C2.1 Economy

Table C2.1.1 Operating costs

Indicator	**Before (2011)**	**B-a-U (2012)**	**After (2012)**
2. Operating costs (euro/year)	N.A.	N.A.	7.656 €

Operating costs include (Table 3):

a. Data transfer costs
The transfer of data from each means of transport where a video surveillance system is installed to the dispatching centre for displaying real-time images from within vehicles is realised by 3G technology (SIM cards). The total cost of the subscriptions for data transmission for all 100 vehicles is 400 €/month.

b. Costs with the monitoring team

The four-person team that works in the dispatching centre has got several tasks. The amount of time assigned to each activity is as follows: supervising the 100 vehicles through the GPS system (Measure 76) – 50% of the total working time, monitoring the images received from the video cameras – 10%, answering the toll-free phone – 10%, other specific activities – 30%. The operating costs for the whole measure obtained by summing up the monthly costs are 638 € per month.

Operating costs (euro)	Monthly	Annually
Data transfer	400 €	4,800 €
Dispatch centre (4 persons; 10%)	238 €	2,856 €
Total	638 €	7,656 €

Table 3 The constituents of the operating costs

Table C2.1.2 Capital costs

Indicator	Before (2011)	B-a-U (2012)	After (2012)
2.b Capital costs (euro)	N.A.	N.A.	438,600 € *

** the price in euro is calculated at an exchange rate of 1 euro = 4.5 lei*

The capital costs represent the amount spent for purchasing all equipments (video management and storage system, IP video camera, LCD TV screen, video camera energy supply) that compose the video surveillance system (Table 4).

Capital costs	euro
Video management and storage system	284,378
IP video camera	125,333
LCD TV screen	23,333
Video camera energy supply	5,556
Total	438,600

Table 4 The constituents of the capital costs

In case of the BaU scenario no investments for purchasing a video surveillance system are made. This is true also for the “before” data.

Table C2.1.3 Maintenance costs

Indicator	Before (2011)	B-a-U (2012)	After (2012)
2.c Maintenance costs	N.A.	N.A.	2,328 €

For the year 2012 the maintenance costs for the video surveillance system represent the part of the labour costs of the specialised maintenance team which corresponds to the maintenance activities: 194 € per month on average , i.e. 2,328 € per year.

C2.2 Transport

The interviews for assessing the quality of service indicator were carried out in the same stop during the three periods the surveys took place in before and after the implementation of the measure. In the charts below a characterisation of the respondents is provided (Fig. 3).

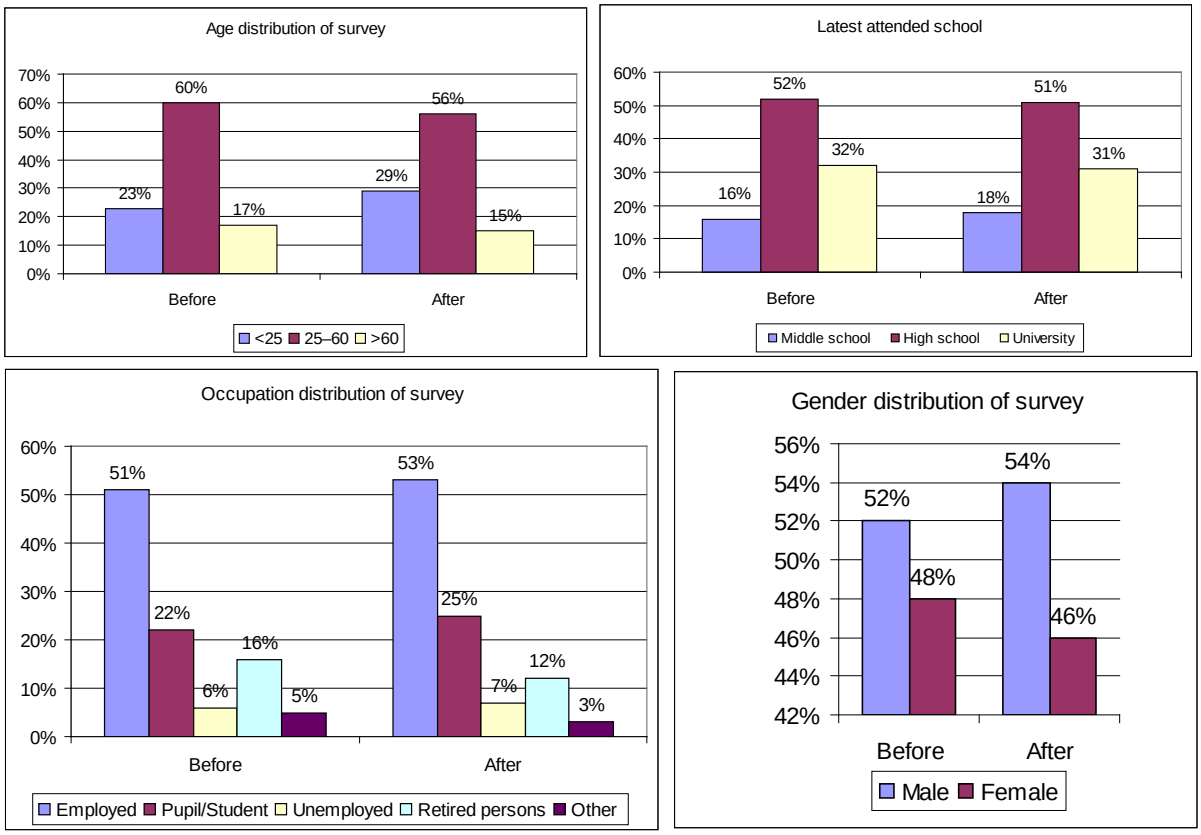


Fig. 3 Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 3), we notice the following evolutions in the "before" and "after" situations:

- Most of the interviewees are within the 25 to 60 year-old bracket (60% and 56%, respectively).
- Most of them have attended only high school (over 51%) or also university (over 31%).
- 52% and 54%, respectively, are male, and 48% and 46%, respectively, are female.
- Most of the respondents are employed (51% and 53%, respectively), to which a significant percentage of students adds (22% and 25%, respectively).

Table C2.2.1 - Quality of service

Indicator		Before (May 2011)	After (July 2012)	After (September 2012)
15. Quality of service (%)	1. Totally satisfied	2%	3%	5%
	2.	8%	11%	11%
	3.	38%	40%	40%
	4.	30%	27%	25%
	5. Totally dissatisfied	22%	19%	19%

Indicator		Difference: After (July 2012) – Before	Difference: After (September 2012) – Before
Quality of service (%)	1. Totally satisfied	1%	3%
	2.	3%	3%
	3.	2%	2%
	4.	-3%	-5%
	5. Totally dissatisfied	-3%	-3%

For the assessment of this indicator the respondents were asked to answer how satisfied they were with the following:

1. the behaviour of the drivers of public means of transport towards passengers
2. the behaviour of the ticket inspectors in public means of transport towards passengers.
3. the behaviour in traffic of the drivers of the public transport company.

Both the table above, C2.2.1, and the graphical representation of the quality of service indicator contain the average of the percentage value resulted from the answers to the three questions for each of the five satisfaction levels.

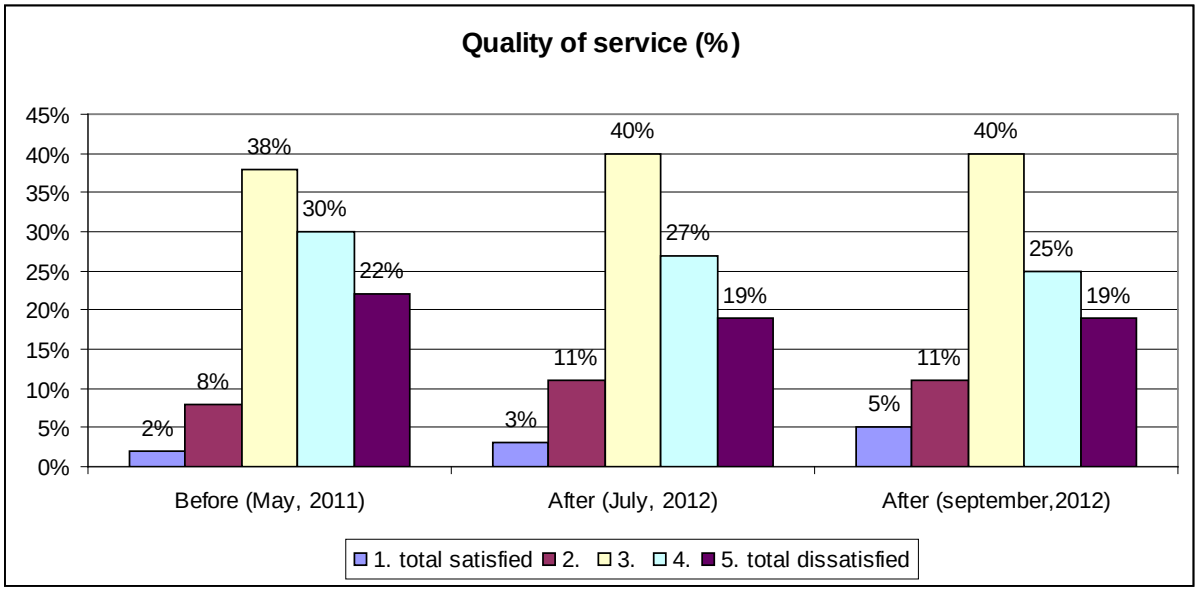


Fig. 4 Quality of service evolutions (before: 2011, after: July, September 2012)

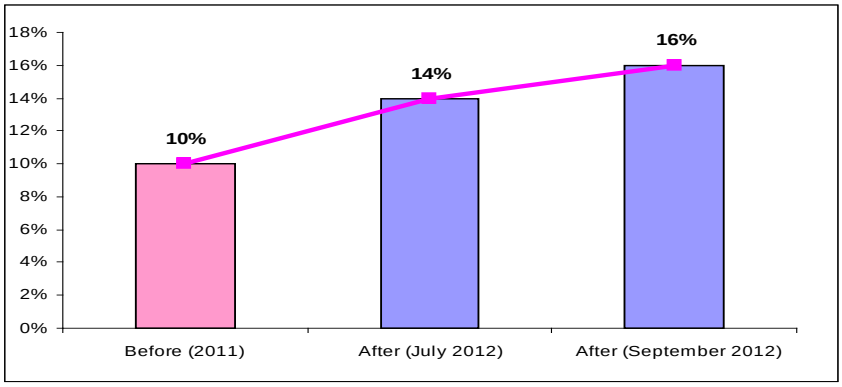


Fig. 5 Quality of service – positive feedbacks

The surveys carried out among passengers revealed an improvement in the quality of service. If we add the positive feedback (Fig. 4 – points 1 and 2 on the evaluation scale) registered for this indicator, we obtain an increase of 16 % in September 2012, after implementation, compared to the level of satisfaction of 10 % recorded in 2011 (Fig. 5). The number of passengers included within the "neither satisfied nor dissatisfied" category remained almost the same (around 39%).

C2.3 Society

Figure 3 above presents details about the people interviewed for the assessment of the awareness level and acceptance level indicators.

Table C2.3.1 – Awareness level

Indicator		Before (May 2011)	After (July 2012)	After (September 2012)
13. Awareness level (%)	1. Yes	35%	47%	49%
	2. No	10%	7%	6%
	3. I don't know	55%	46%	45%

Indicator		Difference: After (July 2012) – Before	Difference: After (September 2012) – Before
Awareness level (%)	1. Yes	12%	14%
	2. No	-3%	-4%
	3. I don't know	-9%	-10%

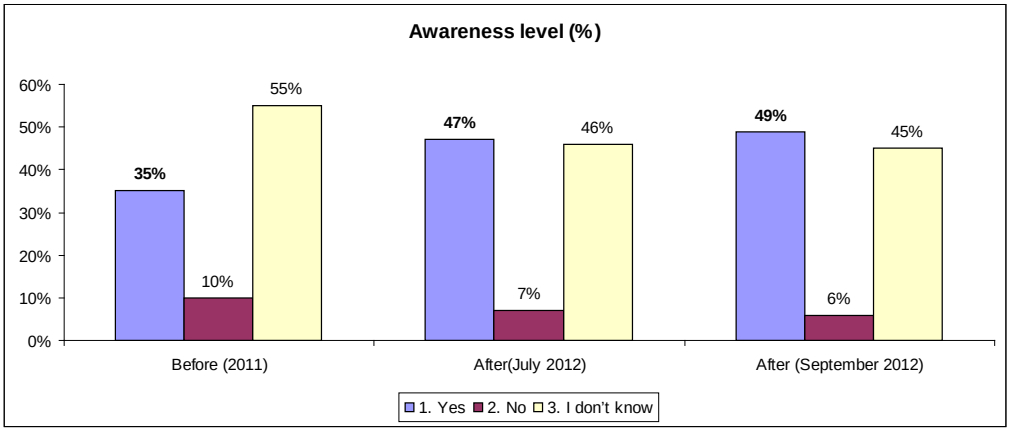


Fig. 6 Awareness level evolutions

Fig. 6 shows that the percentage of the respondents who had heard about the tasks implemented through this measure increased from 35% in 2011 to 47% in July 2012 and to 49% in September 2012. The number of those who had not heard about the measure decreased from 55% in 2009 to 46% in July 2012 and to 45% in September 2012.

Table C2.3.2 – Acceptance level

Indicator		Before (May 2011)	After (July 2012)	After (September 2012)
15. Acceptance level (%)	1. total disagreement	54%	47%	46%
	2.	33%	31%	29%
	3.	9%	14%	16%
	4.	3%	7%	8%
	5.total agreement	1%	1%	1%

Indicator		Difference: After (July 2012) – Before	Difference: After (September 2012) – Before
Acceptance level (%)	1. total disagreement	-7%	-8%
	2.	-2%	-4%
	3.	5%	7%
	4.	4%	5%
	5.total agreement	0%	0%

For the assessment of the acceptance level indicator the respondents were asked to answer if the following aspects would improve if video cameras were mounted inside public means of transport:

1. the behaviour of the drivers of public means of transport towards passengers

2. the behaviour of the ticket inspectors towards passengers
3. the behaviour in traffic of the drivers of the public transport company.

The same questions were asked for the "after" situation, but they were adapted to the stage the task was in (already implemented).

Both the table above, C2.3.1, and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the three questions for each of the five agreement levels.

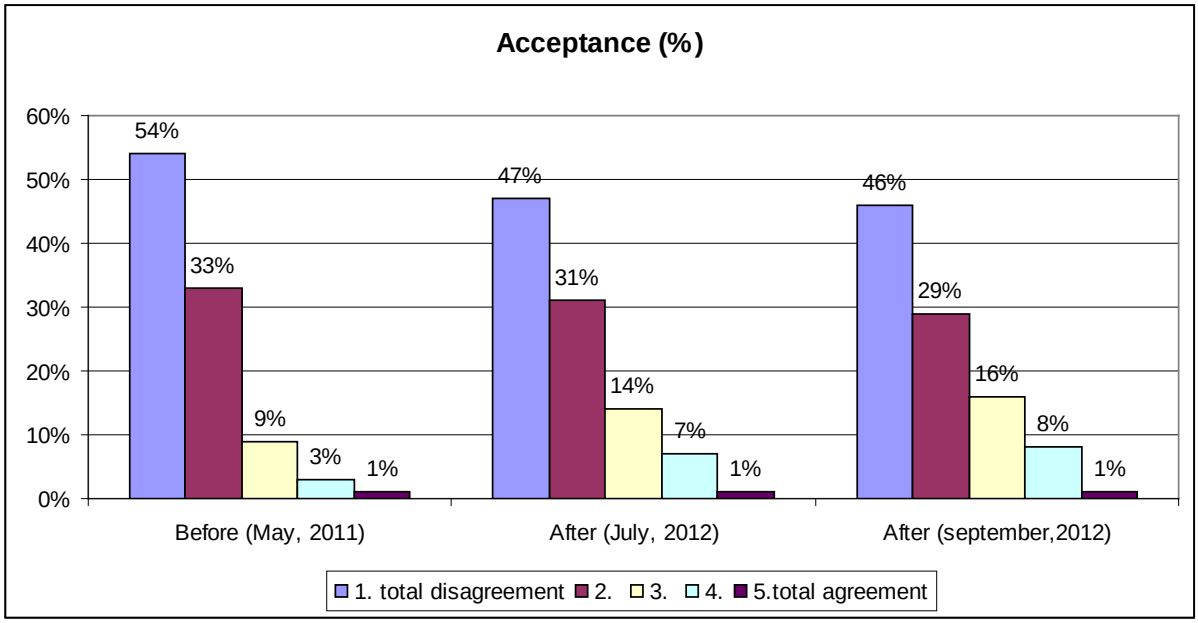


Fig. 7 Acceptance level with respect to the improvement of the behaviour of public transport employees after the video surveillance cameras were installed

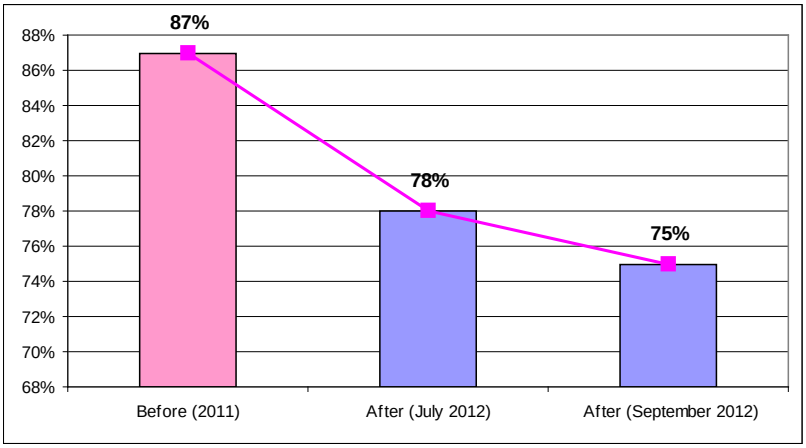


Fig. 8 Acceptance level - sceptics' trend (points 1 + 2)

On analysing the acceptance level, we notice that the percentage of the respondents who think that the behaviour of drivers and ticket inspectors towards passengers (points 4 and 5 – Fig. 7) improved as a result of this measure: it increased from the 5% in 2011 to 9% in September 2012. This is due to the decrease of the percent of the respondents who did not believe in the success of this measure from 87% in 2011 to 75% in September 2012 (Fig. 8).

Table C2.3.3 Number of complaints

Indicator	Before (2011)	BaU (2012)	After (2012)
No. of complaints	318	318	216

Indicator	Difference: After – Before	Difference: After – BaU (2012)
No. of complaints	-102	-102

The public transport company recorded 318 complaints with respect to employees of the company (drivers and tickets inspectors) in 2011.

18 of the complaints registered within the incident management system in August 2012 were about employees of the public transport company, and the same number was recorded in September. Therefore, we take a monthly average of 18 complaints, which means 216 complaints per year.

In the case of the BaU scenario no investments for purchasing the VSS are made. This situation is the same for the before-data.

We assume that the number of complaints in the BaU scenario is equal to that in the "before" situation, because:

- it is hard to estimate the trend of evolution of complaints because there are multiple factors that influence its value and difficult to anticipate:
  - the context under which the incident took place;
  - the objectivity of the claimant;
  - the dynamics of the employees does not allow permanent "education";
  - while we can assume that the number of ticket inspectors stays relatively constant, the employees in charge with ticket inspection change quite often; the same is true for bus driver, however this phenomenon has not been widely spread.
- 423 complaints were recorded in 2010, and 318 in 2011, which indicates that the annual trend decrease is 25%. However, to use this value as a trend of annual evolution would be unrealistic, because this would mean that the value would turn to 0 in only a few years.

Considering the above, we conclude that the pessimistic assumption is the more realistic situation, where the number of complaints is similar with the "before" situation and that it stays constant in the next years.

Table C2.3.4 Number of collisions

Indicator		Before (2010)	BaU (2012)	After (2012)
No. of collisions per year/100 vehicles	Fault of an employee of the public transport company	36	36	48
	Somebody else's fault	115	115	96
	Total	151	151	144

Indicator	Difference: After –Before	Difference: After – BaU (2012)
No. of collisions	- 7	- 7

The vehicles belonging to the public transport company were involved in 416 collisions in 2010, associated to a fleet of 276 means of transport (121 trams and 155 buses) (Table 5).

No. of collisions (vehicle fleet 2010)	Guilty party	
	Public transport company	Other
Trams (121 pcs.)	43	140
Buses (155 pcs.)	56	177
Total	99	317
	416	

Table 5 – The distribution of the number of collisions of the entire fleet.

In order to keep the elements of comparison consistent, we transpose the annual number of collisions for 100 vehicles into percents correlated with the number and type of public means of transport with surveillance cameras (the 36 trams represent 30% from the total number of trams of the transport company, and the 64 buses represent 41%).

No. of collisions (100 vehicles, 2010)	Guilty party	
	Public transport company	Other
Trams (36 pcs., 30 %)	13	42
Buses (64 pcs., 41 %)	23	73
Total	36	115

Table 6 The distribution of the number of collisions for 100 vehicles – the "before" situation.

In 2010, before the measure was implemented, the 100 vehicles were involved in 36 collisions caused by drivers of the public transport company and in 115 collisions caused by others.

For the "after" situation in August and September 2012 the following values for vehicles with video cameras were recorded (Table 7):

No. of collisions (100 vehicles, 2012)	Guilty party	
	Public transport company	Other
August	4	7
September	4	9
Monthly average	4	8
Total in 2012	48	96

Table 7 The distribution of the number of collisions for 100 vehicles – the "after" situation.

We notice that 24 collisions were recorded in the two months, which means an average of 12 per month. This leads, assuming the risk posed by generalisation, to an annual number of collisions of 144 (for 48 of them the public transport company is to blame, and for 96 there are other guilty parties – Table 7).

In the case of the BaU scenario no investments for purchasing the VSS are made. This situation is the same for the before-data.

We assume that the number of collisions in the BaU situation is equal to that in the "before" situation because:

- it is difficult to estimate the evolution of the number of collisions, because the factors which influence it are numerous and hard to anticipate – the most important are traffic conditions;
- 446 collisions were recorded in 2008, their number decreased to 402 in 2009, and in 2010 it increased to 416; this shows that the trend does not have a linear evolution in the context of a relatively constant vehicle fleet;
- from the total annual number of collisions where public means of transport are involved, 60-70% are somebody else's fault, hence the growing number of private cars has a major influence on the number of traffic accidents

Considering the above, we regard that the pessimistic situation is the most realistic one, where the number of collisions is similar to that in the "before" situation, and it remains constant in the next years.

C2.6 Cost benefit analysis

C2.6.1 Evaluation period for CBA

- Defining reference case for CBA

The reference case corresponds to the BaU scenario, where no investments for purchasing video surveillance system are made. This situation is the same for the "before" data. For details see Section C1.3 – Methods for Business as Usual scenario.

- Defining lifetime of the measure
  The project lifetime is 5 years, which represents the lifetime of the equipment recommended by the supplier.
- Discount rate
  Following EU recommendations a discount rate of 3.5% is used for the analysis.

C2.6.2 Method and values for monetisation

- Description of how the impacts are monetised

The main parties involved in this measure and the way they influence its impact are synthetically presented in the following table, which highlights how each influences costs and benefits.

Agents	Costs	Benefits
Public transport operator	Operating costs Maintenance costs Vandalisms costs*	The improvement of the transport services leads to an improvement of public transport operator's image* Collisions are investigated more quickly Complaints following incidents inside or close to public means of transport are solved more quickly.
Public transport users		The quality of public transport services increases with the improvement of passengers' security**
Local authorities	Investment (capital) costs	More attractive public transport system**

*The vandalism costs have not been included in the cost-benefit analysis because of lack of recorded data. This is also true for thefts and aggressions among passengers.

** Difficult to assess: omitted.

- References of values used

The values of the indicators included in the cost-benefit analysis (Table 8) were provided by the public transport company.

Indicator (Year 1)	B-a-U	After
Capital costs	0	438,600 Euro
Operating costs	0	7,656 Euro
Maintenance costs	0	2,328 Euro
Collisions	1,971 Euro	1,354 Euro
Complaints	960 Euro	434 Euro

Table 8 – Indicators included in the CBA

The annual values of the indicators are updated with the annual inflation rate for energy, fuel, urban transport, railway transport, etc. (Table 9). The forecasting for 2012-2014 was made by BNR (the National Bank of Romania). Our estimation for the period 2015-2016 has not been mentioned within the public sources of BNR yet.

	BNR			Our estimations	
Annual inflation rate	2012	2013	2014	2015	2016
	5.32%	6.89%	6.60%	6.60%	6.60%

Table 9 The annual evolution of the inflation rate

For monetising the impact of the measure on the number of collisions and complaints, we analyse the total time for investigating collisions and complaints, respectively.

Collisions

For the "before" situation, the investigation of a collision took 4 hours overall if the guilty party was the public transport driver, and 3 hours if it was somebody else's fault. After the measure was implemented, the video images lead to a shorter investigation time: 2.8 hours if the guilty party was the public transport driver, and 2.1 hours if another party caused the accident (an average decrease of 30%). When a driver of the public transport company is the at-fault party the investigation takes longer because of extra analysis stages that must be completed to observe regulations of the transport company.

Assuming that the labour costs for an employee who makes investigations are constant, we get the following values for a collision:

- before (BaU): at-fault party: public transport company – 4 hours * 4.03 € / hour = 16.12 € / collision

  at-fault party: other – 3 hours * 4.03 € / hour = 12.09 € / collision

- after: at-fault party: public transport company – 2.8 hours * 4.03 € / hour = 11.28 €/collision

  at-fault party: other – 2.1 hours * 4.3 € / hour = 8,46 € / collision

Assuming the number of collisions remains constant throughout the evaluation period, by multiplying these values with the total number of collisions per year we get the following results (Table 10 and Table 11):

- at-fault party: public transport company

Collisions	Number	Costs / collision	Annual costs
BaU	36	16.12 €	581 €
After	48	11.28 €	542 €

Table 10 Monetisation of collisions – at-fault party: public transport company

- at-fault party: other

Collisions	Number	Costs / collision	Annual costs
BaU	115	12.09 €	1390 €
After	96	8.46 €	812 €

Table 11 Monetisation of collisions – at-fault party: other

The total number of collisions for the BaU and for the "after" situations is provided in Table 12:

Annual costs of collisions	BaU (2012)	After (2012)
At-fault party: public transport company	581 €	542 €
At-fault party: other	1390 €	812 €
Total	1971 €	1354 €

Table 12 Monetisation of collisions

Complaints

Before the measure was implemented, the investigation for solving a complaint regarding a public transport driver or a ticket inspector took 45 minutes (i.e. 0.75 hours), and afterwards, thanks to video recordings, the time has reduced to 30 minutes (i.e. 0.50 hours).

Once the video surveillance system has been introduced, after a complaint is registered through the incident management system, the department in charge with investigating complaints follows the steps below: watches the video images, arranges a meeting with the parties involved, analyses the data

collected, and makes a final investigation report. The investigation takes approximately 30 minutes overall. In the before-situation, when no video images were available, the time needed for confronting the parties involved and the time required for data analysis was longer, and the total investigation time was about 45 minutes.

Assuming that the labour costs of the employee who makes investigations are constant, we get following values for a complaint:

- before (BaU): - 0.75 hours * 4.03 € / hour = 3.02 € / complaint

- after: - 0.50 hours * 4.03 € / hour = 2.01 € / complaint

Assuming the number of complaints remains constant throughout the evaluation period, by multiplying these values with the total number of complaints per year we get the following (Table 13):

Complaints	Number	Costs / complaint	Annual costs
BaU	318	3.02 €	960 €
After	216	2.01 €	434 €

Table 13 – Monetisation of complaints

The estimation of the evolution of the inflation rate may not be accurate, hence the risk that the annual values of the economic indicators may not be accurate either. Moreover, in the case of collisions and complaints, there is also the risk that their number may not remain constant in the "after" situation, as we assumed for the evaluation period.

C2.6.3 Life time cost and benefit

Capital costs

- CIVITAS measure: represent the amount spent for purchasing all equipments (video management and storage systems, IP video cameras, LCD TV screens, video camera energy supplies) that compose the video surveillance system.
- Reference case: the value is "0" because this situation corresponds to the case where no investments were made into such a surveillance system.

Table C2.6.1 Capital cost in the evaluation period (not discounted)

	Cases for comparison	Cost (€)
Year 1	CIVITAS measure	438,600
	Reference case (or BAU)	0
Year 2	CIVITAS measure	0
	Reference case (or BAU)	0
Year 3	CIVITAS measure	0
	Reference case (or BAU)	0
Year 4	CIVITAS measure	0
	Reference case (or BAU)	0
Year 5	CIVITAS measure	0
	Reference case (or BAU)	0

Operating costs

- CIVITAS measure: include the annual costs for data transfer and for the activity of the personnel in the dispatching centre (monitoring the images received from the video cameras).
- Reference case: the costs are "0" because there is no video surveillance system in this case.

Table C2.6.2 Operation cost in the evaluation period (not discounted)

	Cases for comparison	Values (€)
Year 1	CIVITAS measure	7,656
	Reference case (or BAU)	0
Year 2	CIVITAS measure	8,063
	Reference case (or BAU)	0

Year 3	CIVITAS measure	8,619
	Reference case (or BAU)	0
Year 4	CIVITAS measure	9,188
	Reference case (or BAU)	0
Year 5	CIVITAS measure	9,794
	Reference case (or BAU)	0

Maintenance costs

- CIVITAS measure: are a part of the labour costs with the maintenance team, which correspond to the maintenance activities for the video surveillance system, and which were extrapolated to a whole year.
- Reference case: the costs are "0" because there is no video surveillance system in this case.

Table C2.6.3 Maintenance cost in the evaluation period (not discounted)

	Cases for comparison	Values (€)
Year 1	CIVITAS measure	2,328
	Reference case (or BAU)	0
Year 2	CIVITAS measure	2,452
	Reference case (or BAU)	0
Year 3	CIVITAS measure	2,621
	Reference case (or BAU)	0
Year 4	CIVITAS measure	2,794
	Reference case (or BAU)	0
Year 5	CIVITAS measure	2,978
	Reference case (or BAU)	0

Costs for the investigation of complaints

- CIVITAS measure: are the costs corresponding to the amount of time needed to solve a complaint regarding a public transport driver or a ticket inspector, when video recordings are available as evidence.
- Reference case: the costs correspond to the same activities, the only difference being that no video evidence is available, which extends the duration of investigations.

Table C2.6.8 Other costs – resulting from investigating complaints in the evaluation period (not discounted)

	Cases for comparison	Values (€)
Year 1	CIVITAS measure	434
	Reference case (or BAU)	960
Year 2	CIVITAS measure	457
	Reference case (or BAU)	1,011
Year 3	CIVITAS measure	489
	Reference case (or BAU)	1,081
Year 4	CIVITAS measure	521
	Reference case (or BAU)	1,152
Year 5	CIVITAS measure	555
	Reference case (or BAU)	1,228

Costs for the investigation of collisions

- CIVITAS measure: are the costs corresponding to the amount of time needed to investigate a collision when video recordings are available as evidence.
- Reference case: the costs correspond to the same activities, the only difference being that no video evidence is available, which extends the duration of investigations.

Table C2.6.8 Other costs – resulting from investigating collisions in the evaluation period (not discounted)

	Cases for comparison	Values (€)
Year 1	CIVITAS measure	1,354
	Reference case (or BAU)	1,971
Year 2	CIVITAS measure	1,426
	Reference case (or BAU)	2,076
Year 3	CIVITAS measure	1,524
	Reference case (or BAU)	2,219
Year 4	CIVITAS measure	1,625
	Reference case (or BAU)	2,365
Year 5	CIVITAS measure	1,732
	Reference case (or BAU)	2,521

C2.6.4 Comparison between lifetime costs and benefits

Table C2.6.10 Lifetime cost/benefit of CIVITAS measure (discounted)

	Capital cost (€)	Operation cost (€)	Maintenance cost (€)	Other Costs (complaints) (€)	Other costs (collisions) (€)	Total cost (€)	Total Benefit (€)	Cumulated Cost (€)
Year 1	438,600	7,656	2,328	434	1,354	450,372	0	450,372
Year 2	0	7,791	2,369	442	1,378	11,980	0	11,980
Year 3	0	8,046	2,447	456	1,423	12,372	0	12,372
Year 4	0	8,287	2,520	470	1,466	12,743	0	12,743
Year 5	0	8,535	2,595	484	1,509	13,123	0	13,123
Total	438,600	40,315	12,259	2,286	7,130	500,590	0	500,590

Table C2.6.11 Lifetime cost/benefit of the reference measure/case (discounted)

	Capital cost (€)	Operation cost (€)	Maintenance cost (€)	Other Costs (complaints) (€)	Other costs (collisions) (€)	Total cost (€)	Total Benefit (€)	Cumulated Cost (€)
Year 1	0	0	0	960	1,971	2,931	0	2,931
Year 2	0	0	0	977	2,006	2,983	0	2,983
Year 3	0	0	0	1,009	2,071	3,080	0	3,080
Year 4	0	0	0	1,039	2,133	3,172	0	3,172
Year 5	0	0	0	1,070	2,197	3,267	0	3,267
Total	0	0	0	5,055	10,378	15,433	0	15,433

C2.6.5Summary of CBA results

For the summary of the CBA results, the changes in benefits and costs between the two scenarios are assessed.

Discounted cash flow

	Changes in total cost (€)	Changes in total benefit (€)	Net cash flow (€)	Cumulative cash flow (€)
Year 1	448,584	1,143	-447,441	-447,441
Year 2	10,160	1,163	-8,996	-456,437
Year 3	10,492	1,201	-9,291	-465,729
Year 4	10,807	1,237	-9,569	-475,298
Year 5	11,130	1,274	-9,856	-485,154
Total	110,340	6,018		

Changes in NPV (€): -485,154

This value of the NPV, together with the benefit-cost ratio (BCR = 0.05 – much less than 1) prove that the benefits of the implementation of this measure that could be monetised are much smaller than the initial capital costs and the operating / maintenance costs, if we assume the hypotheses of the BaU scenario.

Several factors could not be monetised in the context of this measure, however they have an impact on different categories of people. The impact can be on:

- Society:
  - The improvement of transport services leads to an improvement of the image of the public transport operator.
  - The quality of public transport services increases with the improvement of passengers' sense of security.
- Economy
  - Technical examinations by experts regarding the dynamics of collisions, which have significant costs, are often not necessary anymore. Also potential trial expenses are avoided thanks to the surveillance system.

C,3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	Installation of a video surveillance system in 100 public means of transport	★★
NA = Not AssessedO = Not Achieved ★ = Substantially achieved (at least 50%) ★★ = Achieved in full ★★★ = Exceeded		

C.4 Upscaling of results

The installation of a video surveillance system can be extended to all public transport vehicles, which would lead to the improvement of security of the entire transport network.
This system can also be implemented on the vehicles of other transport operators in Iasi.

C.5 Appraisal of evaluation approach

We had to make some assumptions when evaluating certain indicators in order to be able to monetise them and to introduce them into the cost-benefit analysis. For example, we obtained the total number of collisions for 2012 by extrapolating the number of collisions recorded during two months (August and September 2012) to the whole year. We used the same method for determining the number of complaints in 2012. Furthermore, in order to monetise a collision and a complaint, we had to calculate the time needed for their investigation according to the stages of this process.

If we were to evaluate the measure again from the beginning:
- we would make the surveys on a larger sample and in different areas of the city where public means of transport with video cameras run;
- we would collect data after a longer period of time following the implementation of the measure; thus the results would be more relevant than those obtained after extrapolating the data we got after only two months of operation.

C.6 Summary of evaluation results

The results obtained after evaluating the indicators specific to this measure are as follows:

- the quality of service indicator increased from 10% in 2011 to 16% in September 2012, which shows a slight increase of the respondents' degree of satisfaction with respect to drivers' and ticket inspectors' behaviour towards passengers;

- the increase of the awareness level indicator from 35% in 2011 to 49% in September 2012 is a consequence of the fact that this project began four years ago, and also of the large number of articles in the press about this measure;

- the conclusion after having analysed the acceptance indicator level is that the percent of the respondents who think that due to this measure the attitude of drivers and ticket inspectors towards passengers has improved raised to 9% in September 2012, which is 5% more than the percent recorded in 2011. This is due to the decrease of the percentage of the respondents who did not believe in the success of this measure from 87% in 2011 to 75% in September 2012

C. 7 Future activities relating to the measure

The video surveillance system, which contributes to the increase of passengers' safety, will be extended to the entire fleet of the public transport company. The system will be integrated within the Traffic Management System, and afterwards implemented at city level within the next two years.

The measure will be evaluated based on face-to-face interviews and on questionnaires which will be addressed to public transport users moving on the CIVITAS corridor. The questions will help assess the respondents' level of awareness and acceptance, and the quality of service level.

D. Process Evaluation Findings

D.0 Focused measure

	0	No focussed measure
2	1	Most important reason
3	2	Second most important reason
4	3	Third most important reason

D.1 Deviations from the original plan

In the DoW, the aim of Measure 13 was to install 50 LED panels at 24 bus stops to provide real-time information based on GPS technology. This measure was initially interconnected to the initial Measure 12, Improved Ticketing in Iasi, and to Measure 76, Bus management system. Therefore, in order to ensure the compatibility of the three systems, a single tender was organised. The procedure was cancelled four times because the legislation changed twice, which led to a modification of the procedure documentation.

Therefore the European Comission was asked to allow the modification of Measure 13 so that a video surveillance system could be installed on 100 public means of transport instead of the 50 LED panels. This proposal was accepted by the EC.

D.2 Barriers and drivers

D.2.1Barriers

Preparation phase

- **6. Positional**. There were no companies specialised in complex video surveillance systems in the area of Iasi.
- **8. Organisational.** The public transport company itself had no experience in setting up and managing such systems.

Implementation phase

- **11. Spatial:** The 100 vehicles had to be adapted for the components of the surveillance system to be installed (the vehicles had to be wired and the accumulators had to be replaced).
- **12. Other (Social).** Some of the drivers were quite reluctant to the idea of being monitored.

Operation phase

- **8. Organisational**. Several categories of the transport company's personnel had to learn to use and maintain the system.

D.2.2Drivers

Preparation phase

- **5. Involvement, communication**. The determination of local authorities, alongside with that of the public transport company to increase passengers' safety inside the public means of transport has helped in the implementation of this measure.
- **12. Other. (Safety).** The public transport operator has set the target to reduce the number of accidents and complaints by installing video surveillance cameras inside vehicles, including inside the driver's cabin.

Implementation phase

- **8. Organisational**. There were a few employees of the public transport operator whose interest in new technologies made them learn quickly how to handle the system.

Operation phase

- **6. Positional**. The possibility of integrating the video surveillance system within other systems (e.g. the system for displaying real-time information on screens inside vehicles) makes the system even more useful.

D.2.3 Activities

Preparation phase

- **5. Involvement, communication**. Information on similar surveillance systems in other countries was collected, because in Romania there were no such systems.
- **9. Financially**. Based on the data acquired the tender documentation was elaborated.

Implementation phase

- **10. Technological**. The 100 vehicles were wired, their accumulators were replaced, the peripherals were linked to one another.
- **8. Organisational**. The personnel who was going to operate and to maintain the new system was trained by representatives of the company who won the tender.

Operation phase

- **10. Technological**. The system is being supervised and any malfunction is immediately reported and fixed.

D. 3 Participation

D.3.1 Measure Partners

- **City of Iasi (Leading Role)**
  - in charge of preparing the documentation, organising the tender, and signing the contract for purchasing the equipments for the video surveillance system.
  - in charge of organising meetings with the public transport company and the supplying company to set the details on the implementation of the video surveillance system.

- **Supplying Company (Principle participant)**
  - in charge of supplying the equipment which makes up the video surveillance system.
  - in charge of organising meetings with the public transport company and of installing the equipment.
  - in charge of ensuring the system's functionality in all the means of transport its components were mounted into.

- **The public transport company (Occasional participant)**
  - participated in the meetings with the Municipality of Iasi and with the supplying company to set the strategy for the implementation of the measure.
  - made available the means of transport for the installation of the equipment.
  - ensures the technical support for the electrical installation of the means of transport and for the optimum positions of the video cameras.
  - monitors the inside of the vehicles equipped with this surveillance system.
  - in charge of collecting all indicators to assess the impact of the measure.
- **Technical University Iasi (Occasional participant)** - participated in organising surveys and face-to-face interviews for the assessment of the measure.

D.3.2 Stakeholders

- **Passengers** – all people going by public means of transport where the surveillance system was implemented, and who are supposed to feel safer when they use public transport services.
- **Ill-intended persons** – the surveillance system inhibits potential criminals from acting inside public means of transport (thefts, aggressions, destructions, etc.)

- **Media** – by propagating the news about the surveillance system mounted inside public means of transport, written and audio mass media can contribute to increasing the feeling of security among passengers and to discouraging certain people from committing crimes inside vehicles of the transport company.
- **The public transport personnel** – drivers and ticket inspectors who do not always have an appropriate behaviour towards passengers will reconsider their attitude.
- **The public transport company** – the implementation of this measure has improved the image of the public transport company by increasing the safety of the main service it provides.
- **The police** – the images from the video cameras inside public means of transport help the police identify criminals.

D.4 Recommendations

D.4.1 Recommendations: measure replication

- **The benefits of this system**. The degree of replicability of this measure in other cities is quite high, since this system offers benefits both to passengers, by increasing the degree of security inside public means of transport, as well as to the transport company, because the overall quality of its services increases with the implementation of such a measure.
- **Stakeholders**. An obstacle in replicating this measure is the capital costs. This barrier can be reduced or even eliminated as a result of the cooperation between the transport company, the municipality and the police, because all these stakeholders would have advantages if the system were implemented.

D.4.2 Recommendations: process

- **Performance of the video system**. The video cameras should have a high resolution, which is very helpful when trying to identify people. No compromises should be made when purchasing the surveillance system; acquiring a cheaper, but low-quality video system can be pointless, because it may not fulfil the purpose it was installed for.
- **Positioning the cameras**. The number of video cameras inside a vehicle and the angle at which they are mounted must be set so as to cover the entire vehicle.
- **System checking**. After the system is installed, all tests must be done in order to check that it functions properly in any condition.
- **Informing the citizens about the measure**. In order to ensure the success of this measure, an adequate campaign should be organised to inform people on the system. The feeling of security of most of them would increase once they have found out that "somebody" is watching them, while the ill-intended would be discouraged to act improperly or commit crimes.

ANNEX 1

The video recorders are equipped with wireless and 3G adapters, which allow WLAN data connectivity with the maintenance facility centre network (see Figure 2 and Figure 3) and instant remote access to images and recordings using the GSM network.

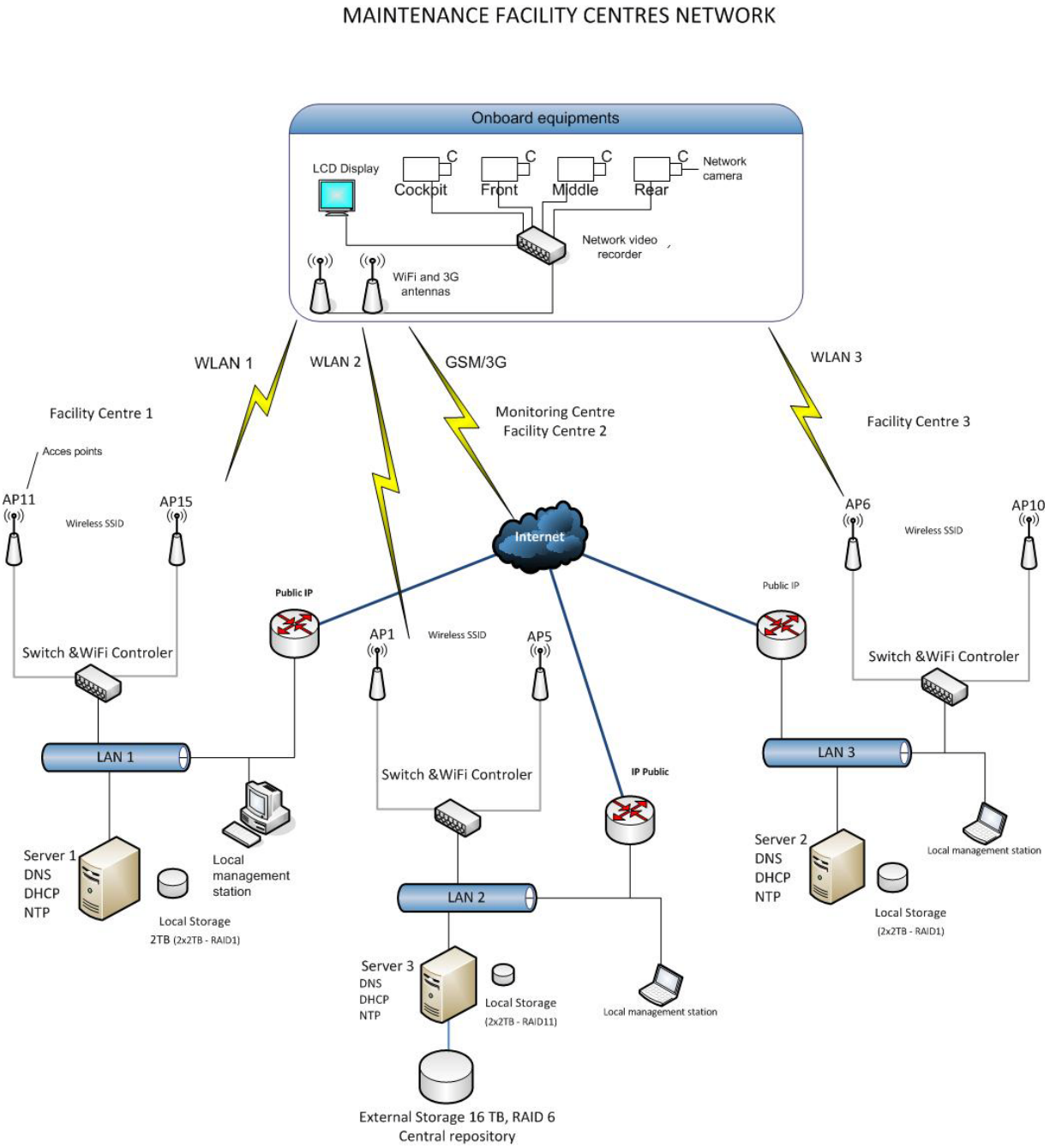


Figure A1: Maintenance facility centre network architecture

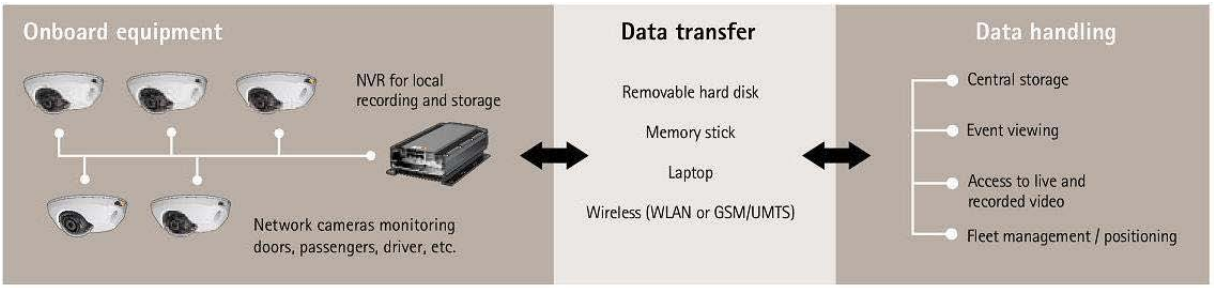


Fig. A2: Data transfer and handling

The video images from the cameras are locally recorded on board, then transferred wirelessly to a local storage device when the buses/trams are in the depot and then, using the VPN infrastructure, they are forwarded and stored on the main maintenance facility centre storage.

The video images from the buses can also be viewed from the Monitoring Centre in real-time by accessing the GSM interface mounted on the NVR.

Each facility centre is equipped with storage devices and local management and recording systems (management server + local storage) (see Figure 4) running **Axis NVR Manager** application, which is used to access, diagnose and manage all the Axis NVRs located in the coverage area of the wireless network provided by the WLAN devices (access points, controllers, routers) installed in each depot.

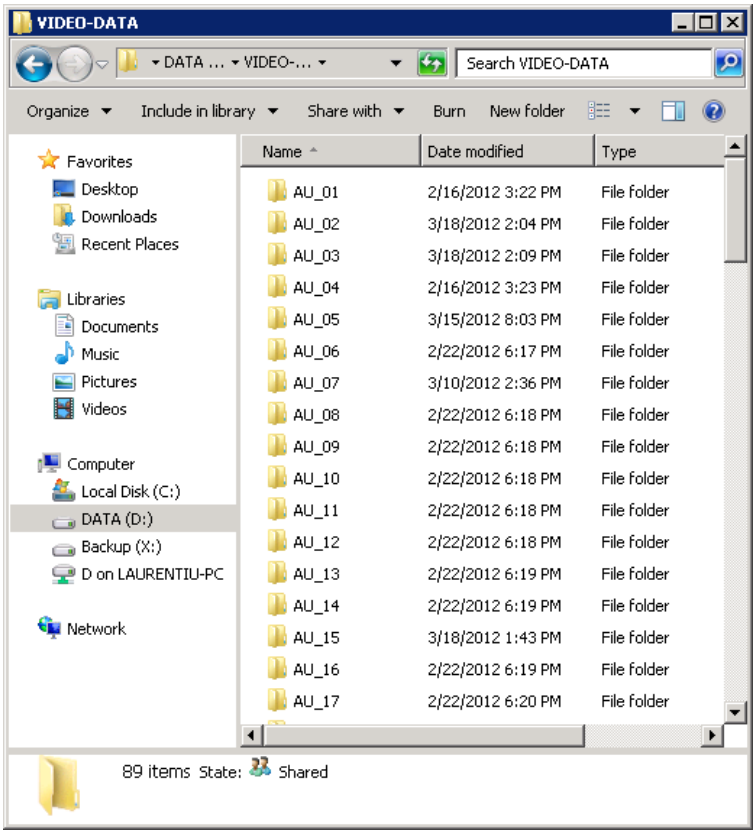


Fig. A3: Storage folder on local management systems

Each of these three locations has one local management station, allowing access, via the **Axis Camera Station Client** application, to the images stored in the NVRs.

The local management stations are accessed through Remote Desktop RDP connections from the Monitoring Centre management station, thus ensuring a single point management solution.

ANNEX 2

Reactions of the written press:

http://www.ziare.com/ziare-iasi/stiri-actualitate/100-de-mijloace-de-transport-public-ale-ratp-au-fost-dotate-cu-camere-video-2864008

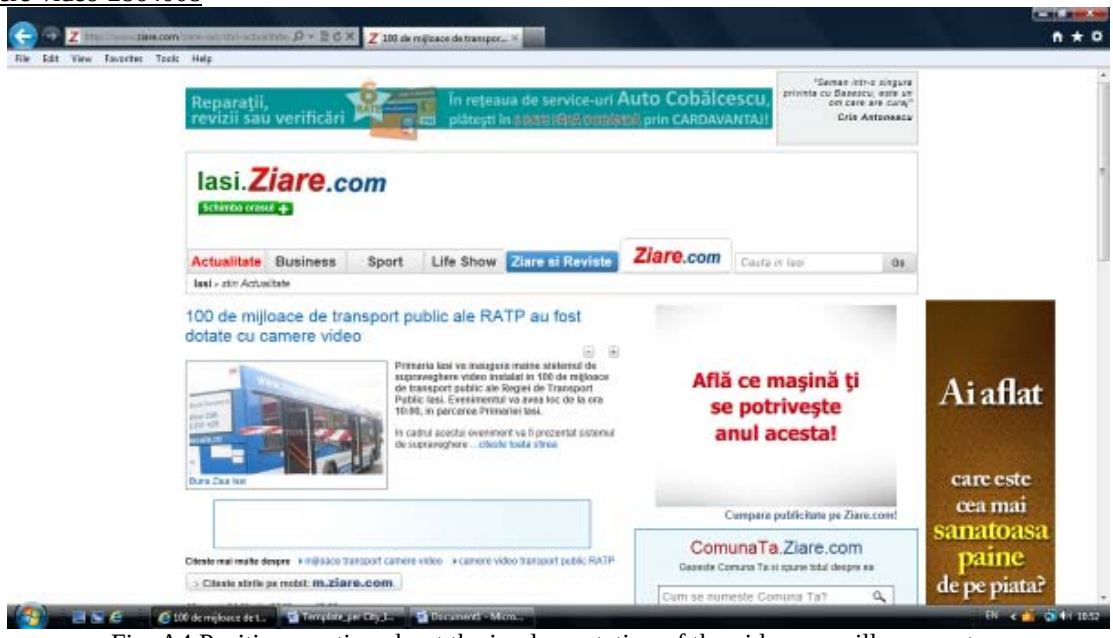


Fig. A4 Positive reaction about the implementation of the video surveillance system

http://www.newsiasi.ro/eveniment/actualitate/1494-videoreportaj-primarul-nichita-a-inaugurat-sistemul-de-supraveghere-video-din-tramvaie-si-autobuze.html

Fig. A5 Positive reaction about the implementation of the system

http://www.administratie.ro/articol.php?id=39278

Fig. A6 Positive reaction about the implementation of the video surveillance system

http://www.ziaruldeiasi.ro/local/400-de-camere-video-au-fost-montate-in-tramvaie-si-autobuze~ni8b19

Fig. A7 Positive reaction about the implementation of the video surveillance system

ANNEX 3

M.13 – Video Surveillance System

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex□ m □f
3. Your profession _____.
4. Latest school attended _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket□ two-trip ticket
   □ set of 10 trips□ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □yes□ no □ I don't know

8. Has the public transport company installed, as a part of the CIVITAS project, a video surveillance system inside 100 public means of transport?
   □yes□ no □ I don't know

9. How satisfied are you about the following aspects of the public transport services?

	very satisfied	satisfied	almost satisfied	dissatisfied	very dissatisfied
Is drivers' behaviour towards passengers adequate?	□	□	□	□	□
Is ticket inspectors' behaviour towards passengers adequate?	□	□	□	□	□
Is drivers' behaviour in traffic adequate?	□	□	□	□	□
How satisfied are you by the services provided by the public transport company in general?	□	□	□	□	□

10. To what extent do you agree with the following statements - (please give a grade from 1 to 5, where 1 means "total disagreement" and 5 "total agreement"):

The video cameras inside the public means of transport have improved drivers' behaviour towards passengers.	1 2 3 4 5
The video cameras inside the public means of transport have improved ticket inspectors' behaviour towards passengers.	1 2 3 4 5
The video cameras inside the public means of transport have improved drivers' behaviour in traffic.	1 2 3 4 5
If the public transport company installed video cameras in all public means of transport, public transport services would improve.	1 2 3 4 5

11. Do you have any suggestions for improving public transportation in general?

Thank you!

Executive Summary

Ever growing city traffic has always been a serious problem for the local community and for local authorities. Therefore, different measures have been adopted to improve traffic flow on several congested roads: road infrastructure has been widened to sustain more traffic lanes, the traffic lights' time for allowing vehicles to cross intersections has been adjusted, etc.

Measure IAS 14 allowed a different approach to finding a solution, focusing on public transport as alternative to private cars. As the number of cars increased over the years, public transport vehicles recorded delays caused by traffic congestion. The solution adopted was to mark a lane especially for public transport vehicles (buses, minibuses, taxis). For the rest of the vehicles, special radar detectors have been installed in the proximity of traffic lights to count the number of cars and, based on mathematical modelling, a traffic control system adjusts in real time traffic light time sequences.

The indicators set for the evaluation of this measure were determined by the following methods:

- Surveys have been carried out among passengers to determine the quality of transport indicator. The results showed that 45% of the respondents are now satisfied with public transport services, with an increase of 9% since 2010, and consider them more attractive and more efficient that before the measure was implemented.
- The accuracy of timekeeping indicator was calculated, and it shows that more and more public transport vehicles arrive at stops on time: 78% in 2010 and 88% in 2011.
- The average vehicle speed was also determined mathematically. Due to the new public transport lane, the average vehicle speed increased in 2009-2011, which had a direct impact on the number of arrivals on time of public transport vehicles. The average speed of buses during peak hours has improved by 5,93% (15.90 km/h) and during off-peak hours by 7.78% (19.40 km/h).

The following can be regarded as lessons that were learned during the implementation of this measure:

- the partial failure of bus drivers to keep the schedule must be analysed in the context of the traffic in the city – to what extent it hinders public means of transport, how busy it is during peak hours is, how long the delays during rush hours comparing to off-peak hours are.
- before reserving a lane for public transport vehicles, one must make sure that this does not result in making that street even more crowded.

From the viewpoint of the measure's evaluation, it is apparent that the traffic flow on the CIVITAS corridor has improved due to the implementation of the traffic control system and the reserved lane for public means of transport. This is the starting point for upscaling the measure to other areas in the city, which have already been selected.

IAS 14 - Bus priority measures

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To promote high quality, high efficient and more attractive public transport services.

(B) Strategic level:

- To improve the traffic of public transport vehicles

(C) Measure level:

- To reserve a lane for public means of transport and taxis.
- To install 15 traffic control units and 54 radar detectors in the intersection on the CIVITAS corridor
- To increase the average vehicle speed by over 10 %.

A1.2 Target groups

Since the prioritisation system was implemented along the CIVITAS corridor, where many schools are located, the main target group consists in school and university students, users of public transport.

Along the CIVITAS corridor there are several tourist attractions, which make tourists another target group.

A2 Description

The increased number of vehicles on the roads affects public transport services, as traffic jams become more and more frequently, mainly during peak hours, hinder public transport vehicles in keeping the schedule.

Therefore, the local authority decided to create special traffic lanes reserved for public transport (buses, minibuses, taxis), marked according to international standards (see section B4 – Actual implementation of the measure).

After analysing all signal-controlled intersections on the CIVITAS corridor, the Municipality of Iasi decided upon the locations (see section B4 – Actual implementation of the measure) where the traffic light priority equipment was to be installed. Among the 17 controlled intersections on the CIVITAS corridor, 15 have been equipped with the traffic prioritisation system. The most important aspect in implementing this type of traffic control system is that it should work in real time, adapting the cycle timings according to the number of cars counted by the detectors when they come close to the controlled junctions.

The combination of traffic regulation (speed limit of 50 km/h) and marking of public transport special lanes, where no other vehicles are allowed to run or park, led to a significant reduction of public transport travel time and to traffic flow improvement. This prioritisation system also benefits the other vehicles, avoiding congestion.

There are six bus lines that run along the road section where a lane was reserved for public transport. Given the number of buses running on each line, the average traffic flow is of 47 buses per hour, which means an average frequency of one bus each 1 to 1.5 minutes.

A3 Person in charge for evaluation of this measure

Names of persons	Homocianu Marius – implementation
	Cristian Stoica – evaluation
Name of organization	Iasi, PTI
Direct telephone	+40742539009, +40722229502
e-mail	mariushomocianu421@hotmail.com, s_tehnic@yahoo.com

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – Before the implementation of this measure there was no difference between means of public transport and the rest of the vehicles. Thanks to this project, public transport has been separated from the rest of the traffic and prioritised.
- **Use of new technology/ITS** – The modernisation of the 15 signal-controlled intersections represents new technology at regional level.
- **New mode of transport exploited** – Public transport benefits from some traffic-related facilities resulting in reduction of delays.
- **New policy instrument** – In the last years, the Municipality of Iasi, being an authority at political and decisional levels, has involved more and more in solving public transport problems.
- **New physical infrastructure solutions** – 15 traffic lights have been modernised to improve public traffic flow on the CIVITAS corridor.

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

Before CIVITAS, traffic flow was controlled by traffic lights that allowed cars and people, respectively, to cross the street in a pre-defined number of seconds, irrespective of the number of cars approaching or waiting at the signal-controlled intersections.

A good example for highlighting the main problems is the Independentei Boulevard. During peak hours, there were so many vehicles (including public means of transport) waiting at intersections, that, when green light appeared, the last two or three cars sometimes were not able to cross the intersection on time. As a result, the speed of vehicles was very low on certain sections, sometimes 10-12 km/h.

B4 Actual implementation of the measure

Stage 1: Identify busy intersections (*February 2010*) – In order to determine the locations where traffic control units were most necessary, a team of specialists from the Municipality of Iasi, the public transport company and the police analysed all the intersections along CIVITAS corridor, both during rush hours and during off-peak hours. They identified the intersections where the high number of cars waiting at traffic lights was causing problems. The traffic in most of the intersections was extremely busy, but, since there were only 15 control units available, this was the number of intersections that was chosen to be controlled. However, the conclusion was that, by improving traffic flow at those intersections, the traffic along the entire CIVITAS corridor was going to improve.

Stage 2: Identify the section for the lane reserved for public transport (*February 2010*): Because of the intense overall level of traffic (especially in the city centre), public means of transport were frequently not able to follow their schedule. This problem was increasing, as traffic jams were becoming more and more frequent, mainly during peak hours. In order to reduce the frequency and severity of these occurrences and also to help public transport users benefit from efficient public transport services, the local authority decided to create special traffic lanes reserved for public transport (buses, minibuses, taxis), marked according to international standards and separated from the

other lanes. After analysing the situation, they concluded that the only part of the CIVITAS corridor where there was enough space to allow this kind of traffic separation was a section of 1250 metres on Independentei Boulevard, in both directions.

Stage 3: Public acquisition procedure (*March 2010*) – The tender notice was published for purchasing the equipment necessary for the traffic priority system.

Stage 4: Signing the contract (*May 2010*) – After the public procurement tender, the winning company signed a contract with the Municipality of Iasi.

Stage 5: Implementation (*June-July 2010*) – Controllers and radar detectors have were installed at the intersections mentioned within the contract and the lane reserved for public transport vehicles were marked on the road.

Stage 6: Evaluation *(November 2009, October 2010 and October 2011)* – Surveys were organised by face-to-face interviews to assess the quality of service indicator. The rest of the indicators were calculated or determined by statistical analysis.

The objectives of this task were:
1. to define priority routes for public transport vehicles – buses and trams (but also open to taxi-cabs) – on the CIVITAS corridor
2. to implement a traffic system with new detection units and traffic controllers at 15 intersections, linked to a central computer server, and to supervise the coordination of the system.

1. Priority route for public transport vehicles

Because of the intense overall level of traffic (especially in the city centre), public means of transport were frequently not able to follow their schedule. This problem was increasing, as traffic jams were becoming more and more frequent, mainly during peak hours. In order to reduce the frequency and severity of these occurrences and also to help public transport users benefit from efficient public transport services, the local authority decided to create special traffic lanes reserved for public transport (buses, minibuses, taxis), marked according to international standards and separated from the other lanes.

The public transport lanes were created in both directions on a 1250m section of Independentei Boulevard, which was the only part of the CIVITAS corridor which had enough space to allow this kind of traffic separation (Fig. 1 and 2). The layout of Independentei Boulevard is shown schematically in Annex 1 and in the following pictures. There are 6 traffic lanes on both directions, including the two lanes reserved for public transport.

Fig. 1 and 2: Lane marking on the bus priority lane on Independentei Boulevard

Independentei Boulevard is one of the busiest streets in Iasi, both because there are many important institutions located along it (the University Hospital, the faculties of Medicine and Pharmacy, the High

School of Arts “Octav Băncilă”, the College of Economics No. 1), and because it "collects" the traffic from other important streets: from West and North-West, in one direction, and from West, East, and South-East in the other, and "leads" it towards the exits at the opposite end. Moreover, this boulevard hosts six different public transport lines.

2. Traffic light priority system

The Municipality of Iasi decided upon the locations on the CIVITAS corridor where the traffic light priority equipment was to be installed, as shown in the map in Annex 2. The most important aspect in implementing this type of traffic control system is that the controllers should work in real time, adapting the cycle timings according to the number of cars counted by the detectors when they come close to the controlled junctions.

The software installed on the central server communicates through GPRS with the control system. Diagnostics and traffic data are presented using tables or directly on the Common Graphic User Interface as follows:

- Map View: displays the whole network in cartographic form.
- Intersection View: presents detailed data directly on the intersection map.
- Signal Group Diagram: status of selected signal groups and selected detectors in a given time period.
- Time Space Diagram: displays signal changes in several controllers simultaneously and superimpose speed lines to facilitate the analysis of the coordination.
- Status Reports and Traffic Data Presentation: provide the access to the diagnostic and traffic data archive of the system.

The Municipality of Iasi, in collaboration with a specialised company, has installed the following equipment on the CIVITAS corridor:
- 15 traffic control units (Fig. 4)
- 54 radar traffic detection units (Fig. 3).

A full specification of the Traffic Controller is presented in Annex 3.

Fig. 3 Traffic signal and radar detector at a junction on the priority corridor

Fig. 4 Traffic light control system at a junction on the priority corridor

The intersections with traffic control units are listed in Annex 4.
The private company in charge of the implementation was selected through a transparent public procurement tender, according to the applicable legal provisions. Within the requirements of this procedure the Municipality of Iasi specified the quality standards the equipment had to meet.

Two training sessions were organised for the staff designated to have the main responsibility for monitoring and maintaining the equipment installed.

During the implementation of the measure various local media presented news about both tasks (see Annex 5) based on press releases issued by Iasi City Hall.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure BH 55 (Cyclists Priority in Brighton & Hove)** – the prioritisation of bicycle traffic in intersections means prioritisation of an environmentally-friendly mode of transport.
- **Measure MNZ 82 (Public Transport Priority System in Monza**) – prioritisation of public transport in certain intersections

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of impact

This measure has a variety of impacts as follows:

- at energy level we aimed at decreasing fuel consumption because buses were supposed to have a continuous movement along the route, with direct impact on economy and environment;
- increased mobility by reducing travel time, which has an impact on society;
- the impact on the transport system is inherent with the lanes reserved for public means of transport;
- impact on modal shift towards public transport.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ECONOMY					
2b			**Capital Costs**	**Capital costs**	**costs per equipments and implementation**	**euro**
2c			**Maintenance costs**	**Maintenance costs**	**costs per equipments**	**euro**
	TRANSPORT					
18		**Quality of Service**	Service reliability	Accuracy of timekeeping	percentage of services arriving / departing on time	Index (%)
19			Quality of service	Quality of service	survey	Index (%),
23		**Transport System**	Congestion Levels	Average vehicle speed – peak hours	Average vehicle speed over whole route	km/h
24				Average vehicle speed – off-peak hours	Average vehicle speed over whole route	km/h

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2b	Capital costs	-	Resulted from the financial offer of the supply company	Once, when the contract is signed
2c	Maintenance costs	As low as possible	Resulted from the financial data analysis regarding the maintenance operations	Annually
18	Accuracy of timekeeping	To keep arrivals in stops in over 90% within the timetable	Is calculated as the weekly weighted mean of arrivals on time. The real situation is compared to the arrivals according to the timetable of a certain bus route	Before - November 2009 After - October 2010 and October 2011
19	Quality of service	Increased	The face to face interviews* were carried out by students in a bus stop on the CIVITAS corridor for five days. 100 people were interviewed in every period the surveys were conducted in. **November 2009.** The survey was conducted (using 100 questionnaires) in Independentei Boulevard, where there is a lane reserved only for buses, and where the traffic light priority system has been implemented. To evaluate the quality of service indicator we tried to find out the respondents' level of satisfaction regarding public transport issues: frequency, arrival and travel times of public means of transport, waiting times in stops, etc. **October 2010 and October 2011.** Another set of 100 questionnaires was used for face-to-face interviews in both cases in the same place and with same questions.	
23	Average vehicle speed - peak	Increased over 10%	These indicators were determined mathematically. We know from the internal exploitation data of the public transport company the length of the lane and the yearly measurements of the time necessary to cover this distance – this is how vehicle speeds at peak hours and during off-peak hours resulted. Measurements were made on bus route 41.	
24	Average vehicle speed - off peak	Increased over 10%		

* The questionnaire is to be found in Annex 6.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	18, 19, 23, 24	M15	PTI, TUI
Collection of after data	2b, 2c, 18, 19, 23, 24	M26, M38	PTI, TUI
D12.2 Baseline and first results from data collection	All indicators	Month 37	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

We take 2009 as baseline year. The conditions in 2009 were:

- traffic lights staying green or red for a pre-defined number of seconds,
- no systems to allow a more fluent traffic,
- crowded intersections leading to very low speed of public transport vehicles,
- no reserved lanes for public transport vehicles.

The following indicators were analysed throughout the evaluation of the measure:

- capital costs – the cost of the equipment belonging to the prioritisation system;
- maintenance costs – the cost for the subscription for GSM data transmission;
- quality of service – by means of surveys

  The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

  The interviews were carried out in the same public transport stop during the three periods the surveys took place. The 100 respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews. The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

  We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

  - accuracy of timekeeping – the number of estimated arrivals on time was compared to the actual number of arrivals on time;
  - average vehicle speed – determined by mathematical calculation.

The last two indicators were determined based on data collected from bus line 41, which runs along Independentei Boulevard, within the CIVITAS corridor.

C1.3 Methods for Business as Usual scenario

If this measure had not been implemented, the problems regarding traffic congestion in the 15 controlled intersections along the CIVITAS corridor would have continued to exist, or, more likely, would have increased due to growing traffic, which would have led to an increase of travel time. With the balance effect of economic crisis, BaU information has been considered similar to before data.

C2 Measure results

C2.1 Economy

Table C2.1.1 Capital costs

Indicator	After -Euro- without VAT
2b Capital costs	55,439 Euro

(The rate exchange is 1 Euro = 4.3 Lei)

Capital costs are the costs of the equipment building the prioritisation system and its installation on site.

Table C2.1.2 Maintenance costs

Indicator	After -Euro- without VAT
2c Maintenance costs	1980 Euro/year

Because the entire prioritisation system still benefits from the warranty period, the maintenance costs result only from the monthly GSM data transmission subscriptions associated with each traffic control unit.
11 Euro / month * 15 units = 165 Euro / month * 12 months = 1980 Euro/year

C2.2 Transport

Table C2.2.1: Accuracy of timekeeping

Indicator	Before (2009)	After (2010)	After (2011)	Difference before-after (2009-2011)
18. Accuracy of timekeeping (%)	78%	85%	88%	10%

Bus line 41, which runs on the CIVITAS corridor, was taken as reference for the assessment of the accuracy of timekeeping indicator. Its length is 20.1 km, and it takes 70 minutes for a bus to make a round trip. The appropriate department of the public transport company provided the data.

The number of arrivals on time and the number of planned arrivals on time of the buses on line 41 during seven days in 2009, 2010 and 2011 are compared in the Table 1:

		Planned			Actual			Weekly weighted mean
		Working days	Weekends	Total	Working days	Weekends	Total	
Arrivals on time	2009	258	148	406	202	116	318	78%
	2010	234	139	373	200	118	318	85%
	2011	219	148	367	192	130	322	88%

Table 1: Number and percentage of arrivals on time 2009-2010-2011

(Note: The arrivals with an accepted tolerance of ± 1 minute are considered to be on time.)

The accuracy of timekeeping indicator was calculated as the weekly weighted mean of arrivals on time.

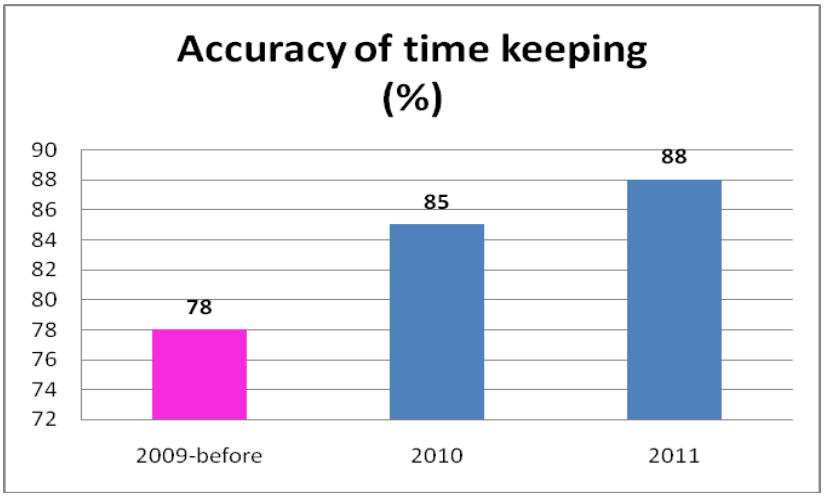


Fig. 5 Arrivals on time

Fig. 5 shows the number of public transport vehicles' arrivals on time in 2009-2011. The arrivals on time follow an ascending trend, reaching 87.5% in 2011.

The quality of service indicator was determined by means of surveys. 100 persons were interviewed in a bus stop on the CIVITAS corridor. A characterisation of the respondents is provided in Fig. 6.

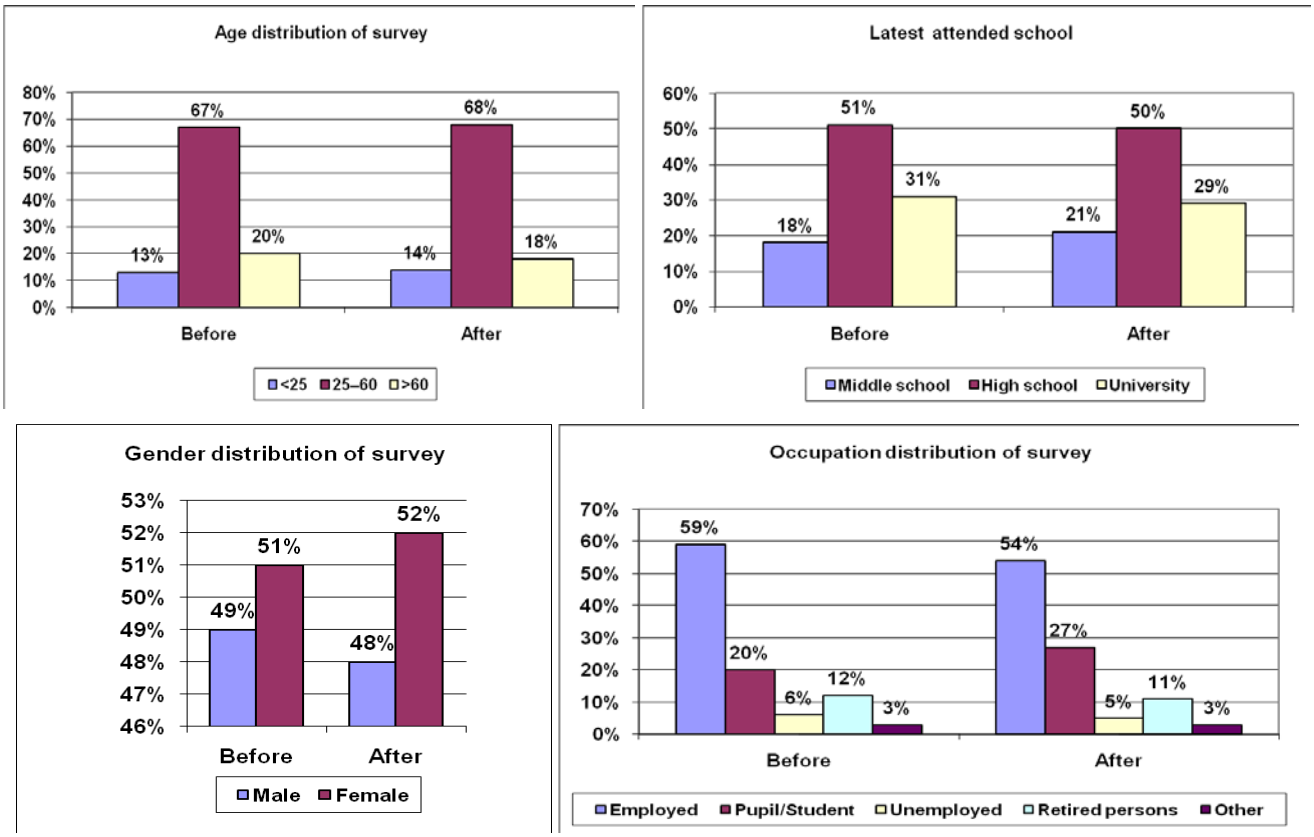


Fig. 6 Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 6), we notice the following evolutions in the "before" and "after" situations:

- most of the interviewees are within the 25 to 60 year-old bracket (over 67%) in both situations;
- most of the respondents have attended only high school (over 50%), and quite a large number have higher education (over 29%).
- most of the interviewees are female in both cases (over 51%).
- most of the interviewees are employed (59% and 54%, respectively), and 20% and 27%, respectively are students.

Table C2.2.2 Quality of service

Indicator		Before (2009)	After (2010)	After (2011)	Difference before-after (2009-2011)
19. Quality of service (%)	1. total satisfied	2%	2%	4%	2%
	2.	34%	38%	41%	7%
	3.	40%	42%	41%	1%
	4.	19%	16%	13%	-6%
	5. total dissatisfied	5%	2%	1%	-4%

For the evaluation of this indicator, the respondents were asked to answer, on a scale from 1 to 5, where 1 equalled "totally satisfied", how satisfied they were about the following aspects related to public transport services:

a. Duration of trips made by public transport.
b. Flow of public means of transport.
c. Frequency of arrivals of public transport vehicles at stops.

Both the table above, C2.2.2, and the graphical representation of the quality of service indicator contain the average of the percentage value resulted from the answers to the two questions for each of the five satisfaction levels.

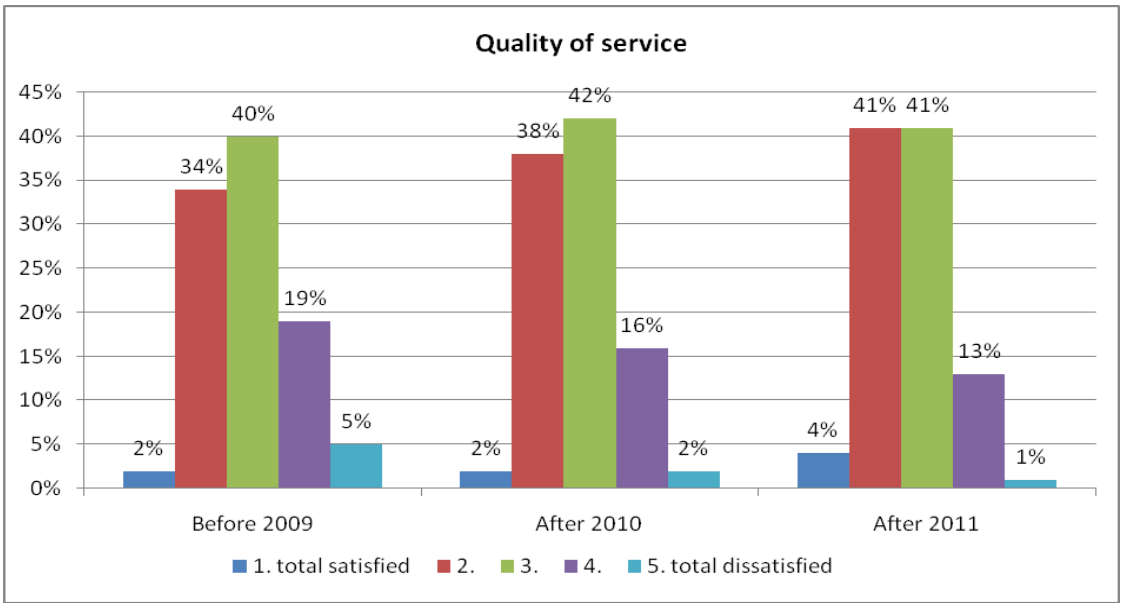


Fig. 7 Quality of service

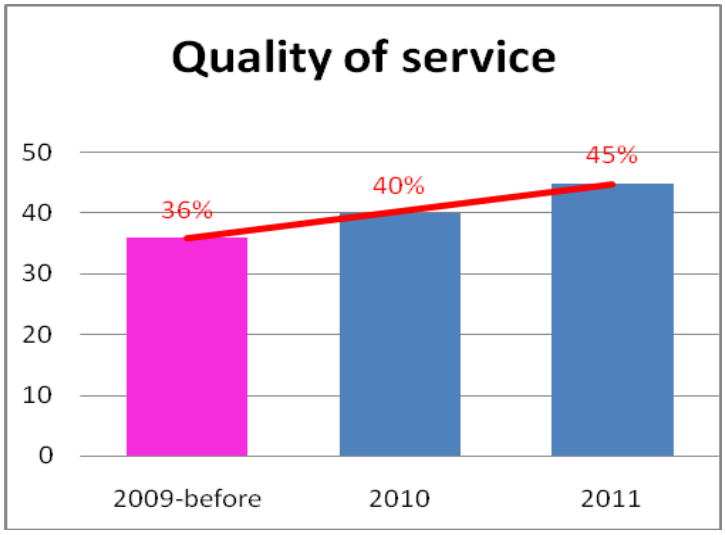


Fig. 8 Quality of service – positive feedbacks

The surveys carried out among passengers revealed an improvement of the quality of service. If we add the positive feedback (Fig. 7 – point 1 and 2 on the evaluation scale) recorded for this indicator, we obtain an increase of 45% in 2011, after implementation, compared to the level of satisfaction of 36% registered in 2009 (Fig. 8). The number of passengers included in the "neither satisfied nor dissatisfied" category remained almost the same (around 41%).

Table C2.2.3: Average vehicle speed

Indicator	Before (2009)	After (2010)	After (2011)	Difference before-after (2009-2011)
23. Average vehicle speed – peak [km/h]	15.01 km/h	15.8 km/h	15.9 km/h	0.8 km/h
24. Average vehicle speed - off peak [km/h]	18 km/h	18.9 km/h	19.4 km/h	1.4 km/h

For determining the commercial speed of buses (i.e. their average speed over a given stretch, including all operational stops), the following was taken into consideration:

- all buses on line 41;
- period for data collection: one month in 2009, 2010 and 2011;
- length of the line;
- the time needed by each bus to make a round trip – each arrival at an end stop is recorded by the dispatcher, who controls bus traffic at that end stop.

The average time needed for a bus to make a round trip during rush hours and during off-peak hours was calculated, and, given the length of the bus line, the commercial speed was determined during peak and off-peak hours (Fig. 9).

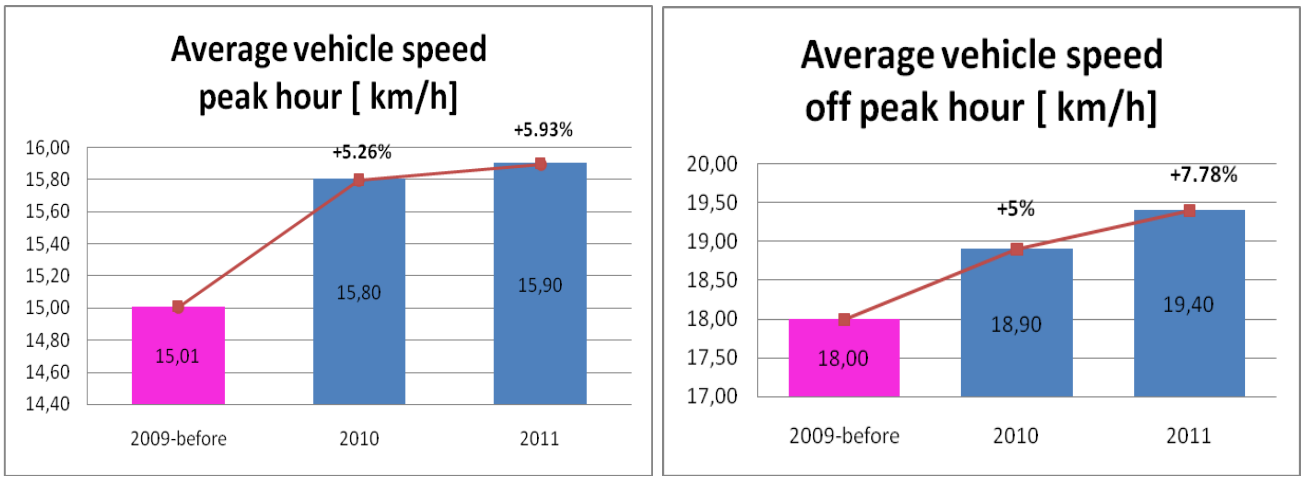


Fig. 9 Evolution of the average vehicle speed

The evolution of the average vehicle speed (Fig. 89) proves that the methods used to improve traffic flow led to a decrease of the time necessary to cover the distance of a certain bus line, which means an improvement of the commercial speed of public means of transport:

- during peak hours: from 15.01 km/h in 2009 to 15.9 km/h in 2011 (5.93%)
- during off-peak hours from 18 km/h in 2009 to 19.4 km/h in 2011 (7.78%).

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To reserve a lane for public means of transport and taxis	★★
2	To install 15 traffic control units and 54 radar detectors in the intersection on the CIVITAS corridor	★★
3	To increase the average vehicle speed by over 10 %	★
NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%) ★★ = Achieved in full ★★★ = Exceeded		

- The objective of 10% has not been reached; the results have been were affected by the works for modernisation of tram tracks, with impact on bus operation. Thisese construction works have a temporary influence on the measure's objectives and we estimate that we will be able to achieve our targets after the works have ended.

C4 Upscaling of results

Now that this system has been implemented as part of ARCHIMEDES IAS 14, the Municipality of Iasi is going to implement a special project for traffic management meant to monitor traffic in the entire city. This project will use the green light system across the city centre as part of a broader traffic management system. This will be implemented according to the description of ARCHIMEDES Measure 76.

C5 Appraisal of evaluation approach

It was quite difficult to calculate the average vehicle speed indicator because of the large volume of information needed.

The evaluation of the accuracy of timekeeping would have been easier if the bus management system had been implemented before the collection of the first "after" data.

If this evaluation process were to be resumed, the interviews would probably be conducted on a much larger sample of citizens and in different parts of the city, so that the impact of the measure could be demonstrated at the level of the city.

C6 Summary of evaluation results

The evaluation of the quality of service indicator, obtained through surveys, showed that the number of passengers satisfied by the priority measures, increased from 36% in 2009 to 45% in 2011.

Regarding the accuracy of time keeping, the 87.5% of the on-time arrivals recorded almost achieved the target value set at 90%.

The average speed of public means of transport during peak hours increased by almost 6% in 2011, compared to the speed recorded in 2009, but has not reached the target set at 10%.

The same is true for the commercial speed of buses during off-peak hours. The speed increased almost by 8%, but has not reached the target set at 10%.

C7 Future activities relating to the measure

After the project ends, the traffic light control system will be maintained in Iasi, the intersections will be continuously monitored, and the necessary corrections will be made in real time to improve traffic flow.

D Process Evaluation Findings

D0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviation from the original plan

There were no deviations from the original plan for the implementation phase. The only changes were those regarding the technical solution for the system. Initially we wanted to interconnect the priority system with the management system (Measure IAS 76); however, we had to change this technical solution due to the difficulties encountered in implementing Measure IAS 76 (delays in the tender procedures). The new solution was to separate the priority system from the management system, so that they worked individually.

D2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **11. Spatial**: Special lanes reserved for public traffic cannot be created anywhere in the city because of spatial limitations (narrow streets). On the other hand, dedicated lanes do not need to be created everywhere because not all the streets have busy traffic. Therefore and because this measure is a pilot project and its implementation cannot cover the needs of the whole city, the right segments had to be chosen with great care.
- **7. Planning**: The lack of experience in traffic management at city level made the technical planning difficult at the beginning.

Implementation phase

- **6. Positional**: This type of measure is relatively isolated in Romania and there are not many companies here with experience in the field of traffic management.
- **10. Technological**: The green-light system on the selected corridor had to be synchronised with the traffic lights on the adjacent streets.

Operation phase

- **11. Spatial**: Because of major investments in city infrastructure that are going on within another project co-financed by the EU, frequent changes have to be made that also affect the traffic on the CIVITAS corridor.

D.2.2 Drivers

Preparation phase

- **1. Political/strategic**: The Municipality of Iasi is highly committed to improving the traffic flow in general and the public transport in particular.
- **4. Problem related**: The constant goal of the transport company is to improve its services and one of the demands of passengers is the reduction in travel time, which can be achieved by creating green light corridors and dedicated lanes.

Implementation phase

- **12. Other**: This measure ensures conditions for ecodriving, especially for the public transport company, by enabling the reduction of constant braking-accelerating sequences, which lowers fuel costs, CO_2 emissions and air pollutants with negative environmental impacts, and also increases the comfort and security of passengers.

Operation phase

- **10. Technological**: The prioritisation system can be extended to other busy streets with many routes of public transport running along, which would give more coherence to the system.
- **10. Technological**: The prioritisation system can be interconnected with other types of systems, which are still to be developed for the city of Iasi.

D.2.3 Activities

Preparation phase

- **4. Problem related**: The traffic in the intersections on the CIVITAS corridor had to be analysed and only 15 of the busiest intersections had to be chosen for the creation of the green light corridor.
- **10. Technological**: A tender for purchasing the equipment for the priority system based on synchronisation of traffic lights was organised after having consulted several specialists.

Implementation phase

- **10. Technological**: The green-light system on the selected corridor was synchronised with the traffic lights on the adjacent streets.
- **8. Organisational**: Two training sessions were organised for the staff members designated to have the main responsibility for monitoring and maintaining the equipment.

Operation phase

- **1. Political/strategic**: The Municipality and the public transport company are working on developing a sustainable urban transport plan, which will also mean extending the green light system and interconnecting it with other computer-based systems.

D3 Participation

D3.1 Measure partners

- **Iasi Municipality (Leading role)**
  - in charge with preparing the documentation for acquisition procedures
  - in charge with organising the tender process for purchasing the equipments for the traffic light priority system
  - in charge with organising meetings and site visits together with the public transport company to decide on the signal-controlled intersections where the traffic light priority units were to be installed and on the section of the CIVITAS corridor where a lane was to be reserved for public transport services
  - in charge with organising meetings with the Traffic Commission to obtain proper authorisations.

- **Supplying Company (Principle participant)** – in charge with supplying and installing the equipments for the traffic light control system and for providing maintenance operations.
- **Telephone Company (Occasional participant)** – in charge with GSM data transmission from the traffic light control units to a central unit and back.
- **Public Transport Company (Occasional participant)**
  - participated in meetings and site visits together with the Municipality of Iasi to decide on the signal-controlled intersections where traffic light priority units were to be installed and on the section of the CIVITAS corridor where a lane was to be reserved for public transport services.
  - in charge with monitoring public means of transport in order to assess the impact of the measure
- **Technical University Iasi (Occasional participant)** – in charge with organizing surveys by face-to-face interviews for the assessment of the measure.
- **Traffic Commission (Occasional participant)** – in charge with approving all traffic changes and releasing proper authorisations.

D3.2 Stakeholders

- **Passengers** – after the measure has been implemented, passengers arrive to their destinations on time more often than before
- **Drivers of the public transport company** – the commercial speed of buses has increased, and drivers can now arrive in stops on time more frequently.
- **Taxis** – they are allowed to run on the special lane.
- **Public transport company** – the improvement in quality of public transport services has led to the improvement of the company's image
- **Other traffic participants** – some of them are not happy about the reserved lane because the number of lanes they are allowed to circulate on has reduced by one

D4 Recommendations

D4.1 Recommendations: measure replication

- **Better public transport – less traffic.** Prioritisation of public transport by means of the traffic light system is a must for a modern public transport system in large cities. This measure can be replicated in other cities because there is a variety of benefits it brings, some of which are interconnected: reduction of travel times for passengers, reduction of constant braking-accelerating sequences, which means lower fuel costs, less negative impact on the environment, increased comfort and security of passengers. The better the public transport quality, the more users that choose to use this service instead of private cars – this is the solution for reducing the traffic volume, with a direct positive impact on the environment.

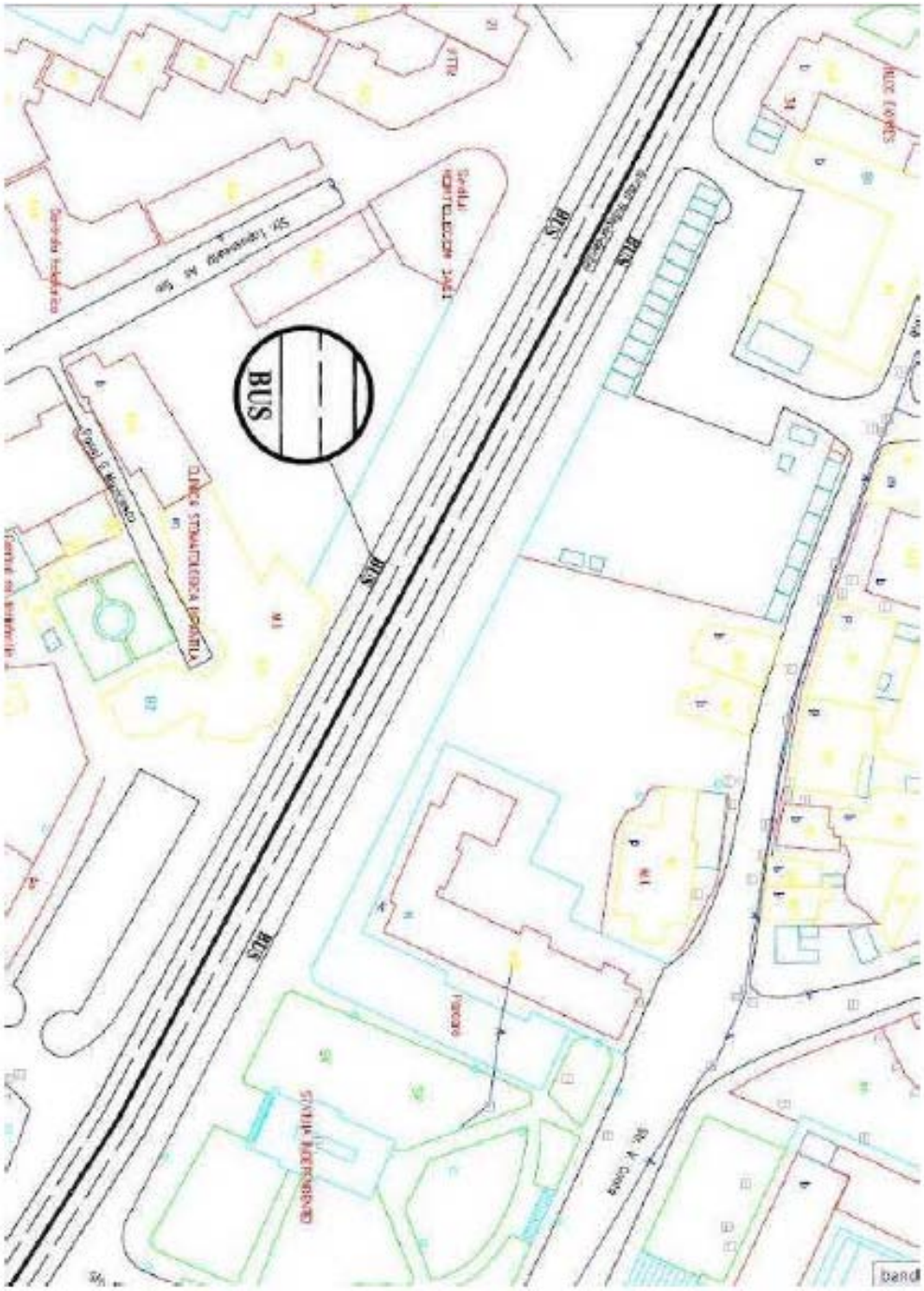
D4.2 Recommendations: Learning from the experiences of the measure

- **Traffic analysis.** The first thing when considering to invest in a priority system for the public transport is to analyse to what extent the rest of the traffic hinders the public means of transport, how busy the traffic during peak hours is, how long the delays during rush hours comparing to off-peak hours are, whether these delays are considered significant and, if not, whether they are predictable so that they can be included in the schedules of each line.
- **Special lanes for public means of transport.** A special analysis must be dedicated to whether creating dedicated lanes for public means of transport is appropriate and to

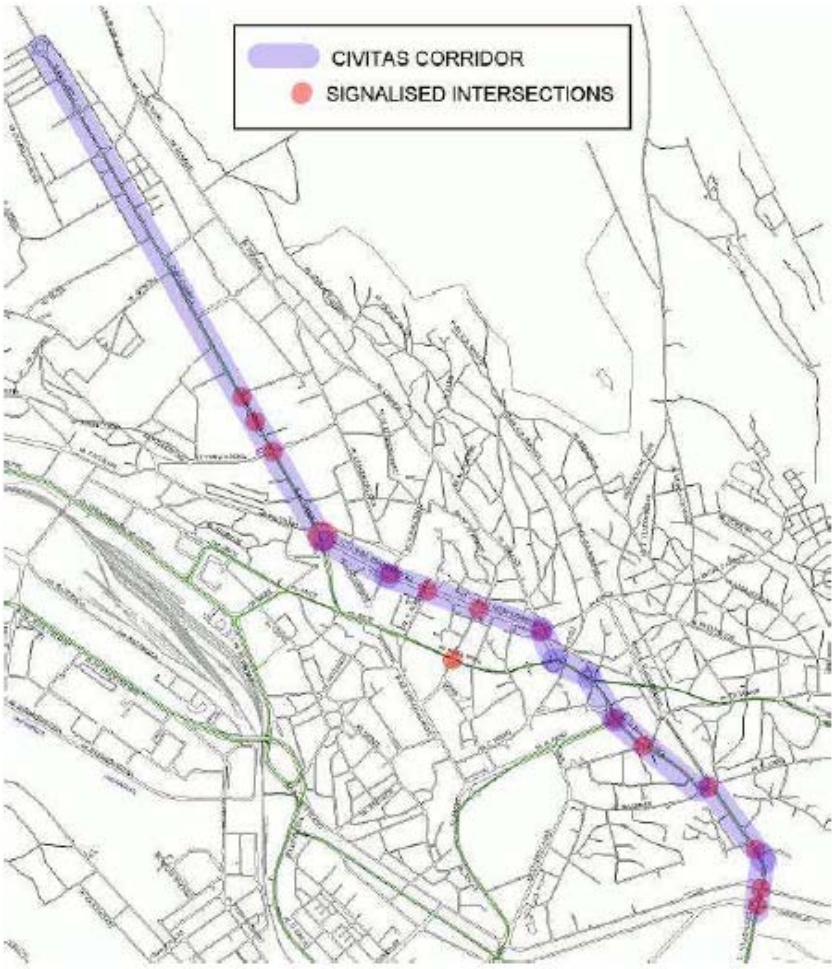
establishing what type of segregation should be chosen. There is always the danger of making the streets even more crowded than if deciding against special lanes.

- **Organisation.** It is recommended that, if not dependant on restricted availability of funds, the system be introduced after other infrastructure-related works are completed (if any planned beforehand).
- **Future development.** Once a green-light system is introduced, one should consider how it can be further used in connection to other computer-based systems (e.g. for providing real-time information to traffic participants on which streets are too busy and should be avoided).

ANNEX 1 Layout of the bus lane on Independentei Boulevard

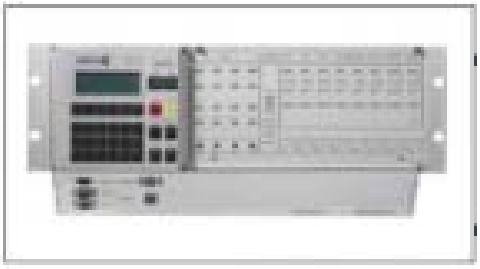


ANNEX 2 Locations of the traffic light priority units on the CIVITAS corridor



ANNEX 3 .Traffic Controller (data sheet)

SOFTWARE FUNCTIONS



The ITC-2 controller's standard software provides a large number of parameter-controlled functions.

- There are 16 traffic plans and 16 traffic situations available with standard parameters for programming of local and central co-ordination. Cable-free linking is possible with a GPS clock.
- One controller can control up to four independent intersections in four separate rings. Each ring can have eight primary stages and an unlimited number of secondary stages. The logic is signal group controlled with a full conflict matrix between all groups.
- Traffic counting with internal detectors with seven-day backup. User defined counting interval.
- Fulfils Scandinavian LHOVRA specification.
- Built-in bus priority functions.
- Built-in advanced programmable control logics enabling the user to create new functions.
- For control and supervision ITC-2 has interfaces to Omnia/Utopia/Spot, Omnivue and EC-Trak UTC systems. The controller can send SMS or e-mails in case of faults.
- Internal web-interface.

RADAR DETECTOR (datasheet)

Operating Principle

The dynamic MW 33x Series of ASIM Doppler Radar Vehicle Detectors are designed for detecting vehicles moving into or through their field of view in short to medium range. The digital output of the detector is activated as long as objects within the field of view are moving. When the movement stops, the output will be reset.
Correct alignment of the detector and a stable mounting structure are mandatory for optimal performance.

How does it work?

The multi-functional model supports additional functions which can be set by a one button- interface:
• Direction discrimination: Detector reacts only to approaching traffic or both directions.
• Minimum speed threshold: 4 or 8 km/h (2.5 / 5 mph)
• Timer function: automatically activates the output to simulate the arrival of a vehicle if the MW 334 has not changed state for a period of 2.5 minutes.

• The detector can be mounted overhead or on a pole on the side of the road. The recommended mounting height is within the range of 1 to 5 m (3 to 16 feet).

Applications

The radar vehicle detectors are ideal for a variety of traffic and intersection control applications:
• Direction dependent vehicle detection.
• Request of green phase.
• Extension of green phase.

Product Highlights

• Easy installation and maintenance. The supplied standard mounting bracket allows an easy und stable mounting for all common applications.
• Front LED to signal the activated output: To easily check the alignment and functionality of the detector.
• Small and rugged housing: The splash proof, rugged housing of anodised aluminum protects the detector in the harshest environmental conditions.
• Operating temperature -40 to +75°C (34 to +167°F)
• Low power consumption
• Maximum detection range of 60 m
• Configuration via one-button interface, no computer necessary.

ANNEX 4 The intersections with traffic control units

1. Splai Bahlui (mal drept) - B-dul T. Vladimirescu
2. B-dul Chimiei - B-dul T. Vladimirescu
3. Aleea Prof. Ghe. Alexa - B-dul T. Vladimirescu
4. Str. V. Lupu - B-dul T. Vladimirescu
5. Str. Elena Doamna - Str. Ghica Vodă
6. Str. Elena Doamna - Str. A. Panu
7. B-dul Independentei - Str. Sărăriei, str. Stihii
8. B-dul Independentei - Str. I.C. Brătianu, str. M. Eminescu
9. B-dul Independentei - Str. V. Alecsandri
10. B-dul Independentei - S tr. V. Conta
11. Rond Eminescu
12. B-dul Carol I - Str. Toma Cozma
13. B-dul Carol I - trecere pietoni Universitate
14. B-dul Carol I - trecere pietoni str. Ghe. Asachi
15. Str. Cuza Voda - Str. I.C. Brătianu

ANNEX 5 Some examples of reactions in written press to the implementation of the measure

http://www.ziaruldeiasi.ro/local/verde-continuu-pentru-mijloacele-de-transport-in-comun-pe-toataruta-tudor-copou~ni6ape

Fig. A1 Positive article about green light corridor – local newspaper

http://www.bzi.ro/banda-de-circulatie-pentru-transportul-in-comun-47867

Fig. A2 Positive article about the special lane for public transport – local newspaper

ANNEX 6

Questionnaire

M.14 - Bus priority measures in Iasi

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest attended school _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket
   □ set of 10 trips □ monthly season ticket

6. How often do you use public transportation? (How many times a week / a month / occasionally..)
   _____

7. Does Iasi participate in CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know

8. Is it true that, due to the CIVITAS project, on Independentei Boulevard a traffic lane was reserved exclusively for public transport?
   □ yes □ no □ I don't know

9. Is it true that, due to the CIVITAS project, radar detectors were mounted next to traffic lights on the route Agronomie – T. Vladimirescu as part of a traffic management system?
   □ yes □ no □ I don't know

10. How satisfied are you with the following issues?

	totally satisfied	satisfied	almost satisfied	dissatisfied	totally dissatisfied
Duration of trips made by public transport	□	□	□	□	□
Flow of public means of transport	□	□	□	□	□
Frequency of public transport vehicles' arrivals in stops	□	□	□	□	□
Public transport services provided by the public transport company in general	□	□	□	□	□

11. To what extent do you agree with the following statements? (with a grade from 1 to 5, where 1 equals "total disagreement" and 5 "total agreement")

The traffic in Iasi is very busy.	1 2 3 4 5
The public means of transport arrive late in stops due to heavy traffic.	1 2 3 4 5
The public means of transport should have more facilities in traffic than other vehicles.	1 2 3 4 5

Using public transport instead of private cars would relieve the traffic.	1 2 3 4 5

12. Do you have any suggestions for improving the circulation of the means of transport?

Thank you!

Executive summary

Within the last years, most of the local companies with a large number of employees established their location outside the city area. Most of the employees have to travel a relatively long distance between home and workplace, which means they have to use either their personal car or public means of transport often more than one. This translates into long travel times, travel costs that may be significant, discomfort, etc.

These are among the reasons that lead to the idea of creating shuttle bus services for the inhabitants of Iasi working outside the city. Discussions were held with several companies, and in the end two contracts were signed.

The following methods were used to determine the indicators set for assessing this measure:

- Surveys were carried out among the employees of the two companies before and after the measure implementation, with the following results:
  - Even though the values of the awareness and of the acceptance levels decreased in 2010 to 47% and 45%, respectively, compared to those in 2009 (67% and 66%), in 2011 they increased again to 72% and 70%.
  - The percentage of workers' positive opinions regarding the quality of shuttle bus service increased from 29% in 2009 to 53% in 2011.
  - The assessment of the modal split indicator showed that the percentage of workers who chose to travel to work by public transport vehicles increased from 71% in 2009 to 87% in 2011, while the percentage of private car users decreased to 11% in 2011, compared to 26% recorded in 2009.

- For the assessment of the traffic flow indicator, the number of cars in the company's parking places and the number of the people carried was counted. The results showed that the number of personal cars decreased to 59 in 2011 (by over 42% compared to 2009), and the number of the people carried also decreased, as expected, to 90 in 2011 (by over 45% compared to 2009).

- The number of the employees using the shuttle bus service to go to work was counted in order to determine the average occupancy indicator. The results reveal that this indicator increased to 679 in 2011, by over 14% compared to 2010.

The indicators above represent the sum of the values recorded by each of the companies.

The following can be regarded as lessons that were learned during the implementation of this measure:

- companies should be approached in decreasing order of the number of their employees; the larger the number, the higher the probability to be interested in such a service.
- it may be difficult to find companies to accept collaboration (at least it was difficult in our case); it is important not to give up after the first negative answers, but to continue identifying other potential interested companies, and to try improve the approach.

The good results obtained after evaluation can be used as argument during future discussions with other companies outside the city.

IAS 15 – Business District Shuttle Bus in Iasi

A Introduction

A.1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To create a sustainable urban transport system.

(B) Strategic level:

- To encourage people to think about their transport habits.

(C) Measure level:

- To create shuttle bus services for the employees of the interested companies to offer them a more efficient transport alternative to private car and to regular public transport routes in terms of trip duration, schedule, and price.
- To reduce the number of personal cars used to travel from home to working place.
- To create a more fluent traffic.

A1.2 Target groups and target area

The target group is represented by the workers who use shuttle buses.
The target area is represented by the area outside the city where companies with large number of employees are placed.

A2 Description

Before the implementation of the measure, the employees of the companies located outside the city had no other choice for going from home to work and back than using public transport or their car. Many of those who choose the first alternative have to change means of transport at least once, which means increased travel time and discomfort. Those who opt for the latter alternative have to face the busy traffic in the city as drivers, which adds to the level of discomfort and to fuel costs, and which raises the probability of collisions with other cars.

The discussions between the Municipality of Iasi and several companies located outside the city and having large numbers of employees resulted in two contracts for shuttle bus services. These services provide transport routes created especially for the employees of these companies who wish to get to work and back home otherwise than by public transport or by car. The advantages for the users of the service are apparent: they do not need to change several means of transport, which means more comfort, reduction of travel time, and punctuality, and those who used to go by car do not spend money for fuel anymore, travel more comfortably and more safely, contribute to the improvement of traffic flow, and thus to the reduction of pollution.

A3 Person in charge for evaluation of this measure

Names of persons	Daniela Crihan- implementation Manuel Coniac - evaluation
Name of organization	PTI
Direct telephone	+40332409861
e-mail	s_tehnic@yahoo.com

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New mode of transport exploited** – this service is new because large companies had never requested this kind of service from the public transport operator.
- **New organizational arrangements or relationships** – a new type of relationship has developed between companies and the public transport operator.

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

Most of the commuters who use their personal cars to go to work do not bring others with them. Hence, private cars with low occupancy rates going to business districts contribute largely to congestion problems – particularly in the morning. The rest of the employees of the companies located outside the city went to work by public means of transport operating on regular lines.

B4 Actual implementation of the measure

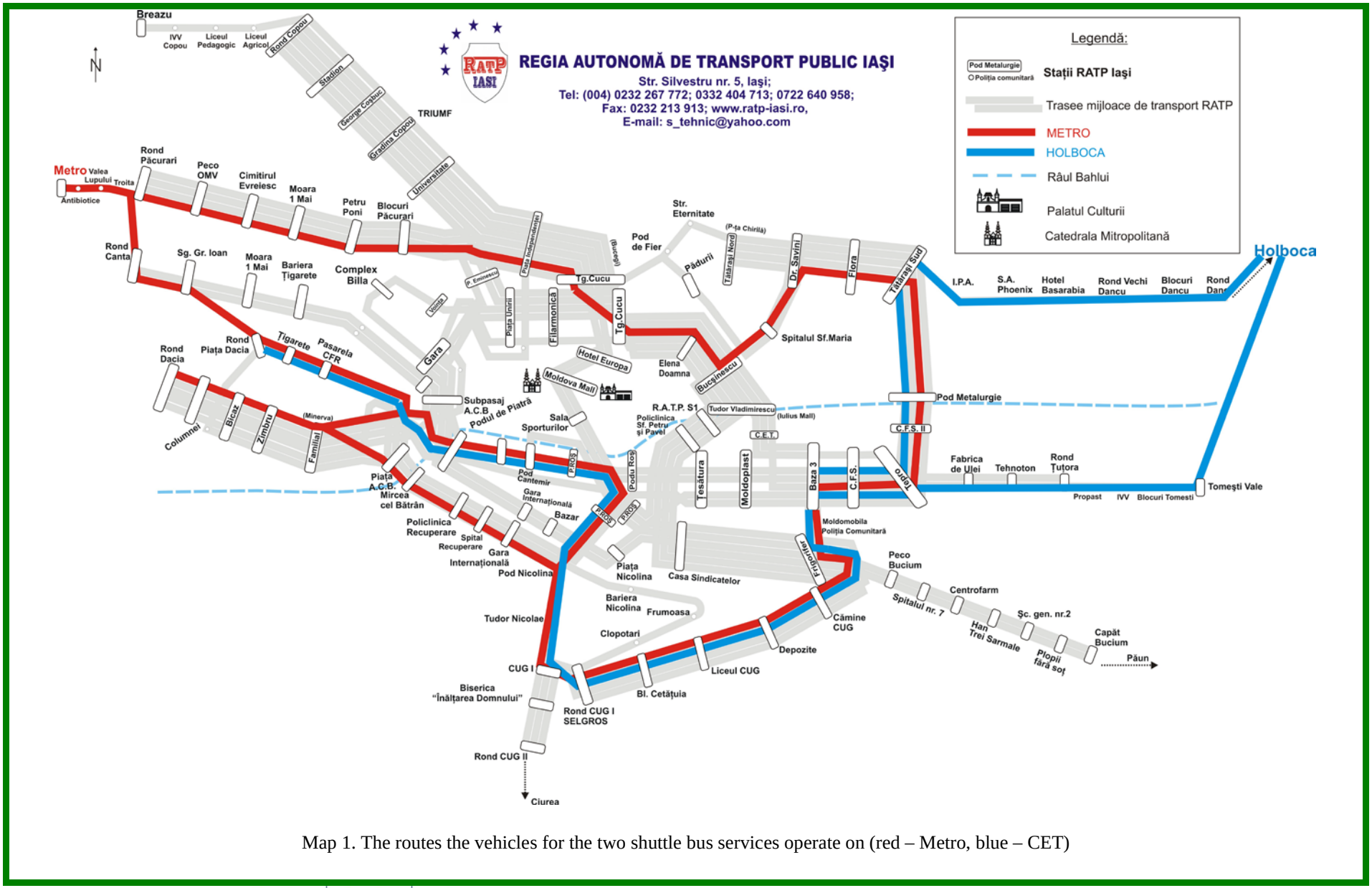
Stage 1: Identification of companies potentially interested in business district shuttle bus services. *(September 2009 to November 2009)* – the Municipality of Iasi contacted several companies located outside the city and presented them the transport offer. The advantages of this type of service was explained to representatives of the companies and to other employees. At the end only two companies agreed to negotiate and sign a contract for this transport service.

Stage 2: Selection and negotiation of the transport route *(September 2009 to November 2009)* – The public transport company together with representatives of the companies and with some of the employees discussed and established the optimal route and timetable for the buses to carry people to work and back home.

Stage 3: Signing the contract *(December 2009)* – After all the details were established, two contract were signed with METRO and CET Holboca (no. 205/28.12.2009, and, respectively, no. 195/17.12.2009).

Stage 4: Collection of data for evaluation – Surveys were conducted and cars were counted before and after implementation: November 2009 – before; September 2010 and September 2011– after.

The Municipality of Iasi started to identify companies having significant numbers of employees and launched the idea that the employees could move between home and work by bus instead of personal cars. Only two companies (CET and Metro) gave a positive answer, and during subsequent consultations with their employees the idea was very well received. Taking into account that the Municipality of Iasi and the public transport company of Iasi had a concession contract called “Public Transport Services in Iasi”, the two parties agreed on making a change and include an amendment so that the transport company could be entitled to operate on the new shuttle bus routes (see Map 1).



Map 1. The routes the vehicles for the two shuttle bus services operate on (red – Metro, blue – CET)

The main benefits for the companies regarding this shuttle bus service are:
- economic – the company's expenses with the transport of employees to and from workplace can decrease substantially through negotiations with the transport company.
- punctuality – the employees are able to arrive on time at the workplace because the transport schedule is made especially for them.

After discussions with CET and Metro, the public transport company evaluated their transport needs based on:
• the number of employees that expressed their desire to use a shuttle bus (450 persons in both companies);
• the routes to be followed, including the starting and end points.
• the schedule of the shifts.

The public transport company received all these figures and signed the contracts with the two companies. The contracts state the optimal routes for the transport of the employees, the prices for renting the vehicles, which differ for Saturdays, Sundays and legal holidays from those for weekdays. The employees from CET are transported with buses or minibuses according to company's needs, and those from METRO are transported with minibuses (Figures 1 and 2).

Fig. 1 Shuttle service operated by buses

Fig. 2 Shuttle service operated by minibuses

The management of CET and METRO consulted their employees and established the optimal transport routes so that all the persons interested had the possibility to benefit from this service. Then they discussed with the public transport company, finalised these routes and decided on the number of vehicles needed.

Buses of the public operator transport employees daily to match the shifts in operation. In Annex 1, the schedules of business district shuttle buses are detailed according to time, routes (including intermediate stops) and length of the routes.

The time the transport vehicles reach METRO with the employees they carry is either 5.30 (the duration of the trip is 40-50 minutes) or 7.30 (trip duration: 75 minutes) for the morning shift, and 13.45 for the afternoon shift. The times of departure are 14.30, 16.30, and 22.30/22.45, respectively.

The time the transport vehicles reach CET with the employees they carry is either 6.50 (trip duration: 50 minutes) or 7.15 (trip duration: 65 minutes) for the morning shift, 14.50 for the afternoon shift, and 21.50 for the night shift. The times of departure are 7.15, 15.05/15.15, and 22.15, respectively.

The main impacts of this measure are:

- fewer private cars leading to a more fluent traffic. For example, while initially about 100 personal cars transported employees to work, after the implementation of this measure, about 75 persons renounced their private cars because they found it more convenient (less stressful) and safer to use the public transport service.

- fewer parking spaces problems. In the case of METRO, for the afternoon shift finding a free parking space was sometimes difficult and stressful.

The public transport company and the management of CET and METRO informed the employees about the shuttle bus service, and posters were also used to inform virtually interested commuters about the schedule and the boarding points (Fig. 3).

Fig. 3 Shuttle bus poster used at the 'Iasi CIVITAS Forum'

To evaluate this measure a set of questionnaires, by face to face interviews, were filled in before and after implementation. They are designed to help determine the potential changing of travel behaviour.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure IAS 35 – Education and promotion programme** – The main target group of this campaign were the school and university students, who were educated on the advantages of sustainable transport. The distribution of promotional materials on the streets made all inhabitants of Iasi part of the target group. This campaign had in common with IAS 15 the attempt to encourage people to use alternative means of transport to private cars.
- **Measure DSS 17 - Business District Shuttle Bus in Donostia-San Sebastian** – this city has promoted the same type of service, and opinions and implementation results will be shared.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

A special transport route generates lower costs than the use of personal cars, hence the economic impact it has on users.

For the commuters who do not own a car, it is also much more convenient to use a shuttle bus than change public means of transport, which may belong to different operators, whose tickets are not valid on other means of transport than their own.

Both types of changes in the transport-related behaviour – shift from personal car or from public transport to shuttle bus – have an impact on modal split.

Reduced number of personal cars means theoretically improvement of traffic flow. However, this can also have the unwanted effect of attracting other car users.

The questionnaires that were addressed to passengers of shuttle buses are intended to be extended to people who do not use this service, and who are potential users working in other companies at the outskirts of Iasi.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
	TRANSPORT					
19		**Quality of Service**	Quality of service	Quality of service	Survey	Index (%)
21		**Transport System**	Traffic Levels	Traffic flow by vehicle type - peak	Number of personal cars - peak	Quantitative
27			Modal split	Average modal split (passengers)	Survey - percentage of passenger-km for each mode	Quantitative
28			Vehicle Occupancy	Average occupancy	No. persons per vehicle/day	Persons/vehicle

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
13	Awareness	Increased	The interviews* were carried out by students in the parking places of the companies involved during five working days. **November 2009.** Two sets of 50 questionnaires, one for each of the companies, were used for face-to-face interviews with employees of the two companies. For the assessment of the awareness level indicator, the interviewees were asked how they considered the idea of a shuttle bus service to transport them between home and workplace. To evaluate the acceptance level, we asked the employees if they agreed that the public transport company offered viable transport solutions for commuters, that the shuttle bus services which were going to be implemented through the ARCHIMEDES project would encourage them to use public transport services instead of personal cars. For the assessment of the quality of service, the questions asked referred to the level of satisfaction about transport conditions, travel times, route coverage provided by public transport vehicles. To determine the average modal split (passengers) we asked the employees to specify what means of transport they used to travel from home to workplace and back: public transport vehicles, personal cars, or others. **September 2010 and September 2011.** Two sets of 50 questionnaires, one for each of the two companies, were used for face-to-face interviews with employees. In order to assess the awareness level, the respondents were asked how they considered the idea of the creation of the shuttle bus service for their company. The questions for the assessment of the acceptance level indicator remained the same, but they were adapted to the stage the task was in (already implemented). The quality of service focused on the level of satisfaction regarding transport conditions, travel times, route coverage provided by the shuttle bus service. The same question was used for the average modal split indicator, the only difference being that "public transport vehicles" was replaced by "shuttle service vehicles".	Before - November 2009 After - September 2010 and September 2011
14	Acceptance	Increased		
19	Quality of service	Increased		
27	Average modal split (passengers)	Increased		
21	Traffic flow	Decreased	The number of commuters' personal cars was counted in the parking places of the two companies.	
28	Vehicle Occupancy	Increased	The number of employees who use the shuttle bus service was counted.	After - September 2010 and September 2011

* The questionnaire is to be found in Annex 2.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	13, 14, 19, 21, 27	M 15	PTI, TUI
	28	Not applicable	-
Collection of after data	All indicators	M 25, M37	PTI, TUI
D12.2 Baseline and first results from data collection	All indicators	Month 39	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

For the evaluation process of the shuttle bus service we analysed the following:

- traffic flow: the number of commuters' personal cars was counted in the companies' parking places;
- vehicle occupancy: the number of employees using shuttle bus service was counted
- the awareness level, acceptance level and quality of service indicators, which were obtained through surveys, were assessed by comparing the results of these surveys before and after the measure was implemented.

  In order to assess the awareness level, the acceptance level, the quality of service and average modal split (passengers), surveys were conducted among the inhabitants of the city of Iasi. The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

  The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people) after the measures had been implemented, thus making it possible to compare the results of the "before" and "after" situations. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

  The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

  The interviews were carried out in the companies' parking places during the three periods the surveys took place in (one before the implementation of the measure and two after).

C1.3 Methods for Business as Usual scenario

If there were no shuttle buses to serve certain business districts outside the city, the people who work there would still have to use either their cars or to change different transport vehicles to go to work. As a result, in both cases, travel time and costs would be higher.

C2 Measure results

C2.1 Transport

The interviews for assessing the quality of service and average modal split indicators were carried out in the parking places of the two companies during the three periods the surveys took place in before and after the implementation of the measure. In the charts below a characterisation of the respondents is provided (Fig. 4).

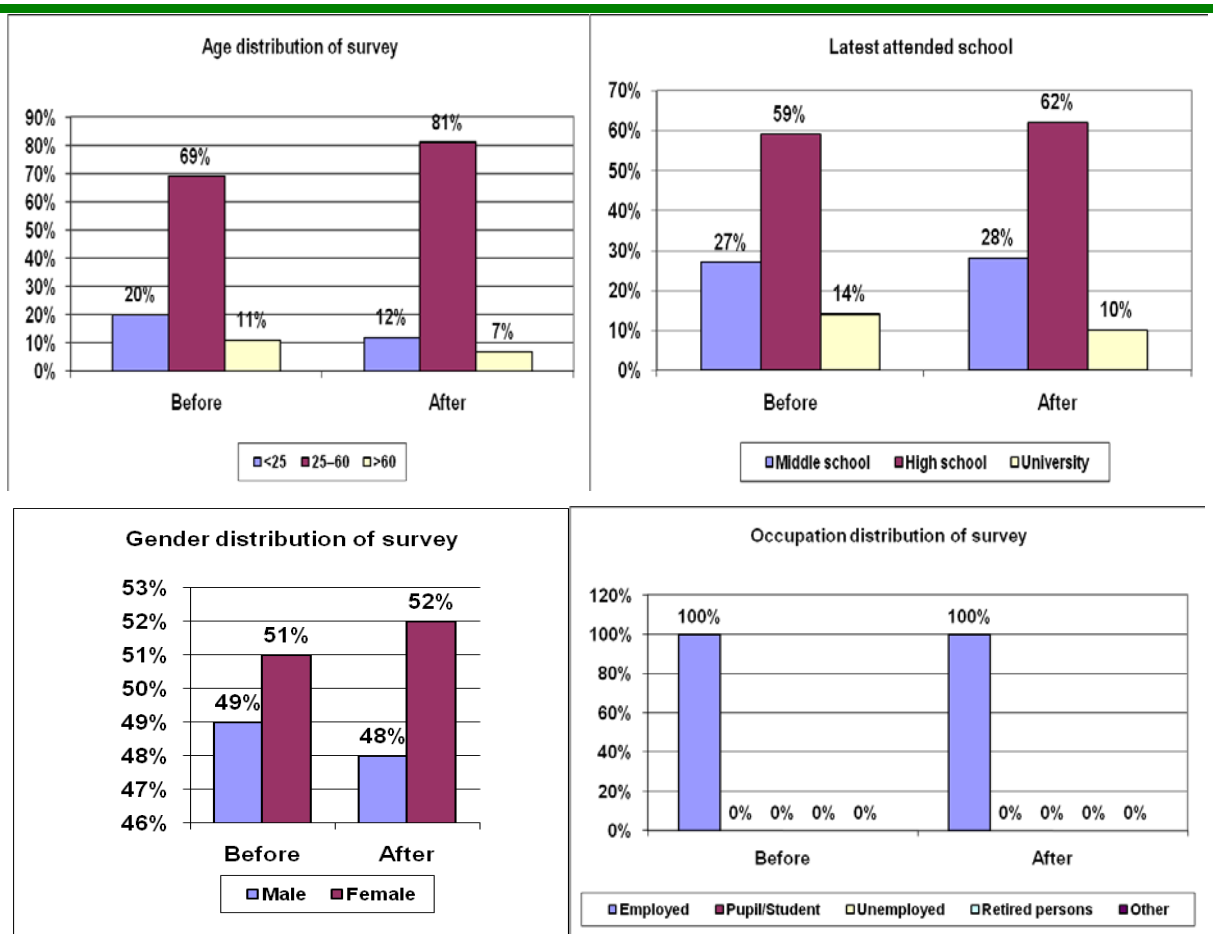


Fig. 4 Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 7), we notice the following evolutions in the "before" and "after" situations:

- Most of the interviewees are within the 25 to 60 year-old bracket (69% and 81%, respectively).
- Most of the interviewees have attended only high school (59% and 62 %, respectively).
- Most of the interviewees are female in both cases (52% and 54%, respectively).
- Since this measure is exclusively addressed to hired people, the occupation variable was not necessary.

Table C2.1.1 Quality of service

Indicator		Before (2009)	After (2010)	After (2011)
19. Quality of service (%)	1. very satisfied	3%	3%	4%
	2.	26%	50%	50%
	3.	37%	34%	34%
	4.	19%	12%	11%
	5. very unsatisfied	15%	1%	1%

In order to determine the quality of service indicator, questionnaire-based interviews were conducted (see Annex 2), and the respondents answered the following questions:

1. How satisfied are you with the following aspects of the services offered by the public transport company with reference to the shuttle buses for commuters (travel time, transport conditions and route coverage)?

Table C2.1.1 contains the average of the percentage value resulted from the answers to the two questions for each of the five satisfaction levels. The graphics in Fig. 5 are based on these percentages.

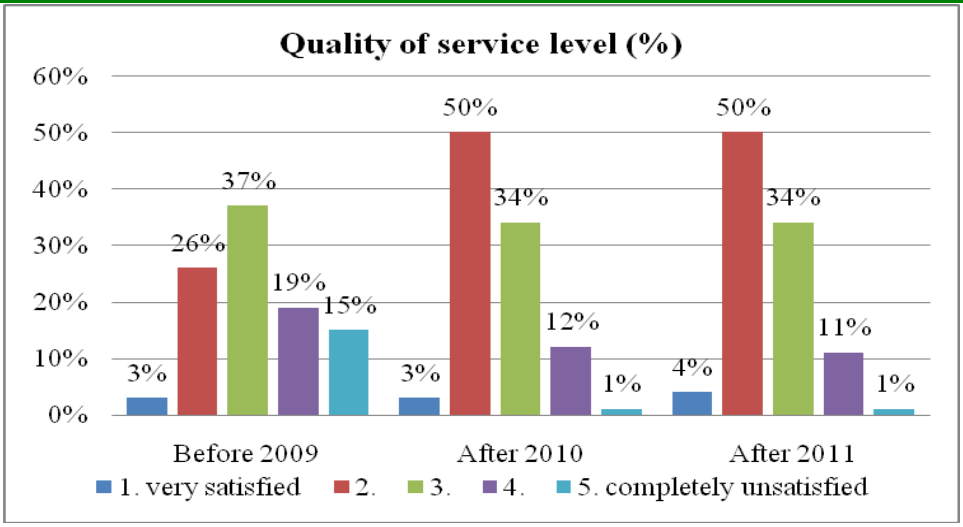


Fig. 5 Quality of service

On looking at Fig. 5, we notice that the percentage of the employees (points 4 and 5) who were unsatisfied about the quality of transport services decreased from 34% in 2009 to 13% in 2010 and to 12% in 2011. On the other hand, the percentage of employees (points 1 and 2) who were satisfied about the quality of transport services increased from 29% in 2009 to 53% in 2010 and to 54% in 2011. The percentage of the employees who were neither satisfied nor unsatisfied did not have a significant evolution (37% in 2009, 34% in 2010 and 2011).

Table C2.1.2 Traffic flow

Indicator		Before (2009)	After (2010)	After (2011)
21. Traffic flow	no. of personal cars	103	87	59
	no. of employees travelling by personal car	165	151	90

The number of personal cars and the number of employees who use them to go to work were counted during a workday in the parking lots of the two companies for each of the two shifts.

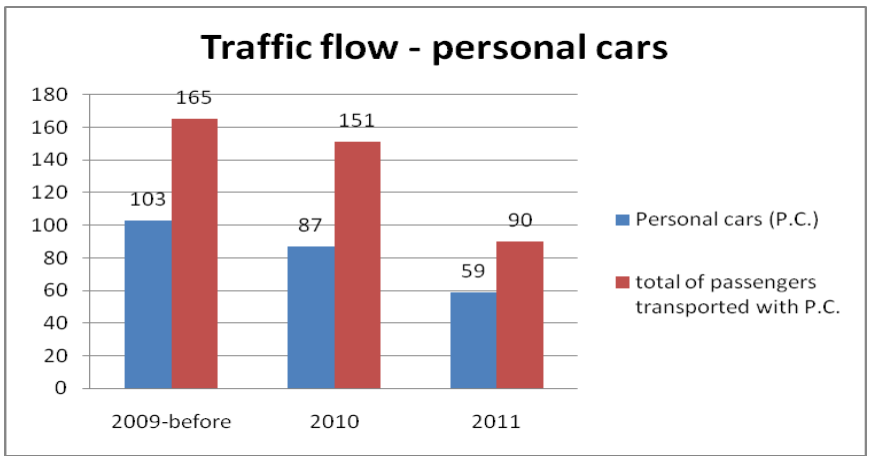


Fig. 6 The number of personal cars and the number of employees who use them per day

Fig. 6 shows that, while in 2009 103 personal cars carried 165 employees, in 2010 and 2011 the number of cars decreased to 87 (151 employees), and 59 (90 employees), respectively.

Table C2.1.3 Average modal split (passengers)

Indicator		Before (2009)	After (2010)	After (2011)
27. Average modal split (passengers) (%)	PT vehicle	71%	78%	87%
	personal car	26%	20%	11%
	other	3%	2%	2%

To determine this indicator the respondents were asked to answer what mode of transport they used for going between home and work.

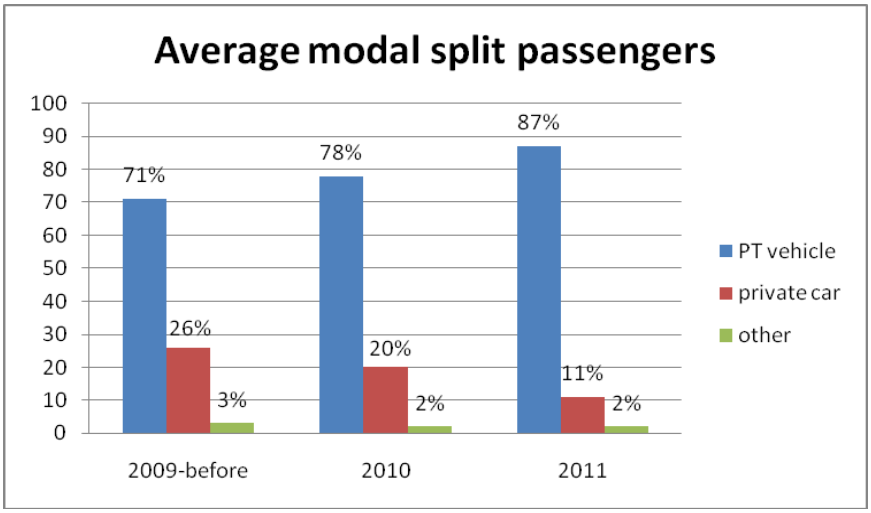


Fig. 7 Percentage of employees using different transport modes to travel to/back from work

On analysing the questionnaires used to determine the average modal split indicator (see Fig. 7 for the results), we see that, before the implementation of this measure, the respondents travelled between home and work with regular public transport vehicles, but not necessary from the same transport company. Some of them used two different public means of transport belonging to different transport operators. Figure 6 shows that the percentage of the employees using the shuttle bus service (which is a special transport service) increased in 2010 to 78%, and in 2011 to 87% compared with 71% in 2009 (regular public transport service). This happened because a part of the workers renounced travelling with personal cars, after this shuttle bus service was created, from 26% in 2009, to 20% in 2010 and 11% in 2011.

Table C2.1.4 Average occupancy

Indicator	Before (2009)	After (2010)	After (2011)
28. Average occupancy no. of passengers/day	NA	598	679

To determine this indicator, the passengers in all buses in both shifts were counted during one day. The counting took place inside the vehicles. The day chosen was not influenced by unfavourable weather conditions, and even if it had been, the small percentage of employees whose answers fell into the “others” category (2%) would not have significantly changed the results.

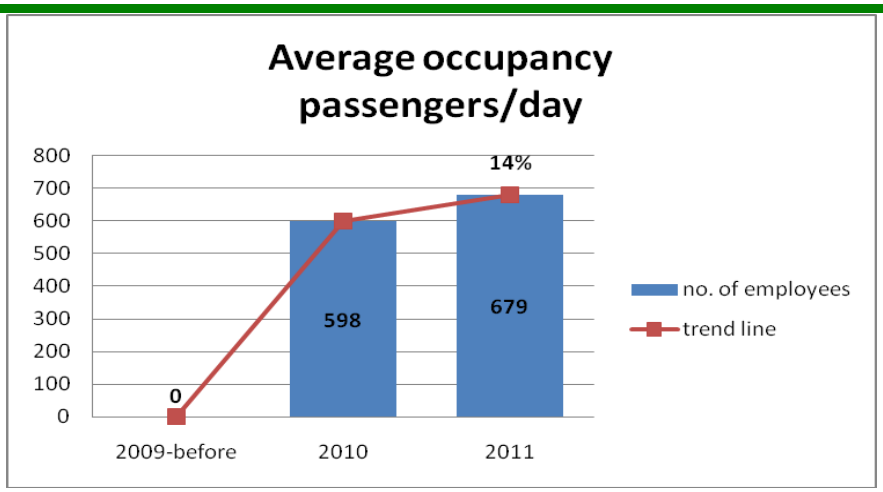


Fig. 8 The number of employees (from both companies) that use shuttle service vehicles

Figure 8 shows that the number of the respondents who use the shuttle bus service increased by 14% to 679 in 2011 compared to 2010.

C2.2 Society

The details about the categories of respondents who were interviewed for the assessment of the awareness level and of the acceptance level indicators have been presented in Fig. 4 above.

Table C2.2.1 Awareness level

Indicator		Before (2009)	After (2010)	After (2011)
13. Awareness level (%)	1. very bad	6%	10%	5%
	2.	12%	17%	10%
	3	15%	26%	13%
	4	24%	11%	28%
	5. very good	43%	36%	44%

To assess the awareness level indicator, the employees were asked to answer the following question of a 1-5 scale:

How do you consider the idea that led to the creation of shuttle bus services for commuters through the CIVITAS project?

Table C2.2.1 contains the average of the percentage value resulted from the answers to the question for each of the five answer choices. Figure 8 was made on the basis of these results.

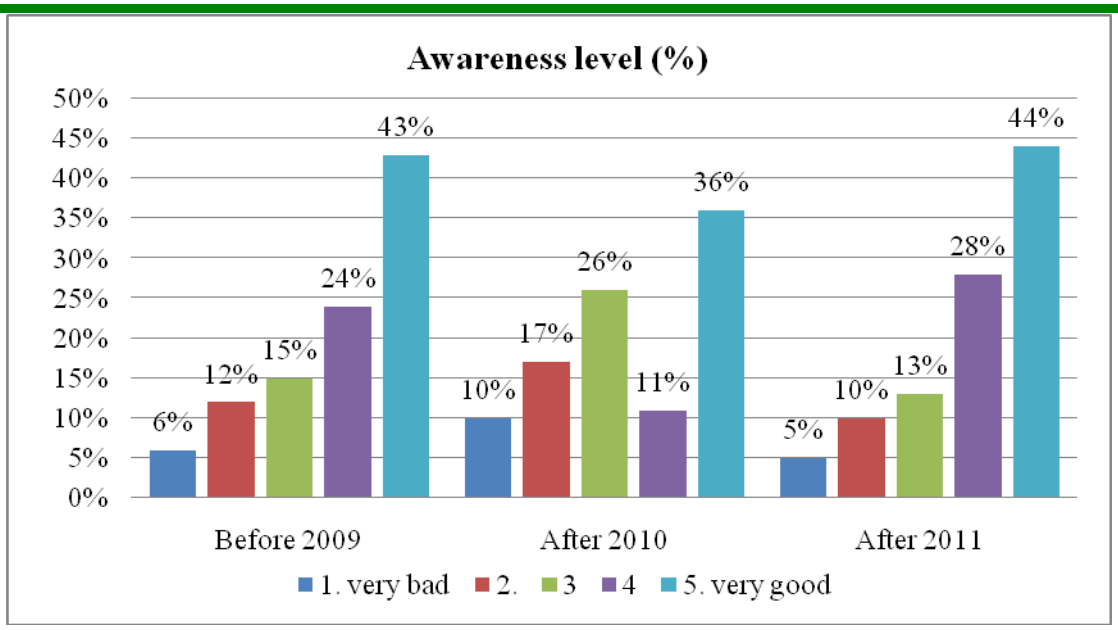


Fig. 9 Awareness level

The awareness level (Fig. 9) indicates an oscillatory evolution of the interviewees who think that it was a bad idea to create a shuttle buse service (points 1 and 2): from 18% in 2009 to 27% in 2010 and to 15% in 2011. The respondents who considered it a good idea (points 4 and 5), decreased from 67% in 2009 to 47% in 2010 and increased in 2011 to 72%.

Table C2.2.2 Acceptance level

Indicator		Before (2009)	After (2010)	After (2011)
14. Acceptance level (%)	1. very bad	1%	9%	1%
	2.	6%	19%	3%
	3.	27%	27%	26%
	4.	37%	20%	40%
	5. very good	29%	25%	30%

For the acceptance level indicator, the question was:

To what extent do you agree with the following statements?

- The public transport company offers commuters viable transport solutions to move between home and work

- Special routes created by the public transport company for commuters encourage them to use public transport vehicles instead of the personal cars.

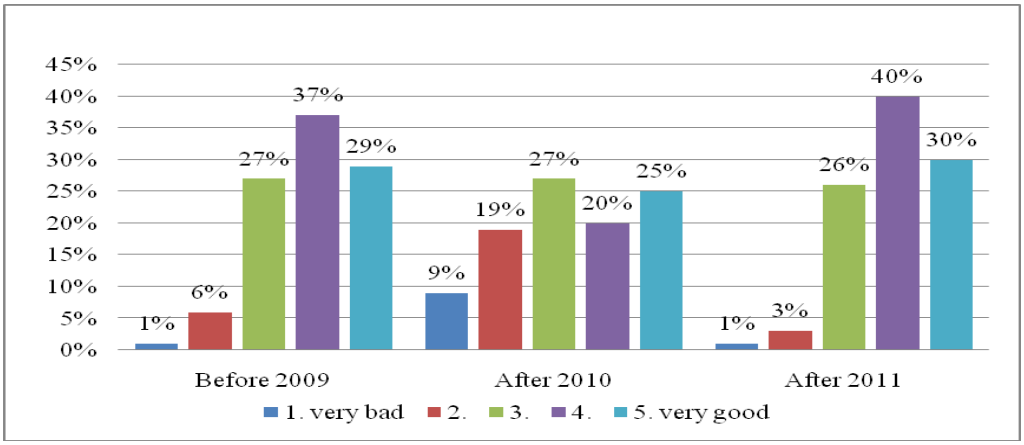


Fig. 10 Acceptance level

Also this indicator has an oscillatory evolution (Fig. 10), both with respect to the people who do not think that the public transport company provides a viable transport solution for commuters (points 1 and 2) – 7% in 2009, 28% in 2010 and 4% in 2011 – as well as with respect to those who are satisfied with these services (points 4 and 5) – 66% in 2009, 45% in 2010 and 70% in 2011.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To create a shuttle bus service.	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

C4 Methods for upscaling

There are many companies in the proximity of Iasi that can benefit from this measure if it were upscaled.

C5 Appraisal of evaluation approach

There were no major problems in evaluating this measure.

C6 Summary of evaluation results

The results of the evaluation of all indicators were satisfying:

- The quality of service indicator recorded an ascendant trend, indicating that the passengers were more and more satisfied with the shuttle bus services: 29% in 2009, 53% in 2010 and 54% in 2011.
- As a consequence, some of them switched to shuttle bus – 71% in 2009, 78% in 2010 and 87% in 2011, instead of personal cars, whose percentage decreased from 26% in 2009 to 20% in 2010 and to 11% in 2011.
- We counted the number of personal cars to determine the traffic flow indicator, and we obtained the following values: 103 in 2009, 87 in 2010 and 59 in 2011, which follow the descendant trend of the average modal split indicator.
- The number of passengers using the shuttle bus service counted in order to obtain the vehicle occupancy indicator, showed an increase with 14% from 598 in 2010 to 679 in 2011.

Even if the awareness and the acceptance levels indicators recorded an oscillatory evolution in the period of evaluation, the percentages obtained in 2011 regarding the good knowledge of the measure (72%) and the acceptance (70%), together with the positive evolution of the other indicators allow us to conclude that this measure was successfully implemented.

C7 Future activities relating to the measure

The public transport company will continue to offer these shuttle bus services to CET and METRO after the project has ended.
Moreover, the public operator and the Municipality of Iasi will keep searching new companies that want to use this kind of transport services.

D Process Evaluation Findings

D.0 Focused measure

0	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D.1 Deviations from the original plan

There were no deviations from the original plan regarding the implementation of the measure. The only change is that the shuttle bus routes cover just a part of the CIVITAS corridor and not the entire length.

D.2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **5. Involvement, communication**: Some of the companies located near the city of Iasi and having a significant number of employees were already transporting their employees between home and workplace with their own buses, and others were simply reluctant to the offer of the public transport company.
- **3. Cultural**: Many people grew too dependent on their private cars to be able to easily switch to other forms of transport. While some can accept the benefits of giving up their cars when other more convenient means of transport are available, others simply do not want to consider changing their habits.

Implementation phase

- **7. Planning**: The optimal routes of the buses so as to satisfy the employees of the contractor (ideally the stops should be as close to their homes) while keeping operation costs low had to be negotiated between representatives of the beneficiaries and of the public transport company.
- **7. Planning**: The schedule of the buses has to be made having in view the needs of the employees it transports, but also the fact that it has to enter normal route service at the right time.

Operation phase

- **1. Political**: The transport license for one of the shuttle bus lines was at a certain point in danger of not being renewed because of adverse political intervention.

D.2.2 Drivers

Preparation phase

- **11. Spatial**: Several large companies located close to the city of Iasi were identified.
- **5. Involvement, communication**: The measure people succeeded in convincing some of the reluctant employees of the benefits of the shuttle bus service.

Implementation phase

- **8. Organizational**: The representatives of the two companies on the one hand and of the public transport company on the other hand were highly motivated to find good solutions to all difficulties.

- **5. Involvement, communication**: A reason the representatives of one of the beneficiaries had for supporting the introduction of this service was the problem of parking space, which the customers of the company had trouble finding especially in the afternoon.

Operation phase

- **5. Involvement, communication**: Two more companies expressed their interest in this type of service of the public transport company.
- **1. Political**: The recent change in the county administration as a result of local elections had positive effects to this measure.

D.2.3 Activities

Preparation phase

- **7. Planning**: The measure persons searched for potential partners and contacted them in order to present their offer.
- **5. Involvement, communication**: Surveys were carried out in order to determine the awareness and acceptance levels regarding this measure, and the degree of satisfaction in respect to the services of the public transport company, so that a possible change in travel behaviour can be later determined.

Implementation phase

- **5. Involvement, communication**: The inherent difficulties in negotiating the optimal routes were surmounted during the meetings between the parties involved.
- **7. Planning**: The schedule of the shuttle buses had to be correlated with the schedule of normal routes, so that entering normal service is made at the right time.

Operation phase

- **4. Problem related**: The success of the measure motivated the representatives of the transport company to insist in getting the license renewed.
- **5. Involvement, communication**: Surveys were carried out in order to determine if any changes in travel behaviour have occurred since the shuttle bus service has been introduced.

D.3 Participation

D.3.1. Measure Partners

- **The Municipality of Iasi (Leading Role)**: in charge with identifying companies interested in a shuttle bus service.

  - The Municipality of Iasi and the public transport company have a concession contract called "Public Transport Services in Iasi", and both parties agreed to make an amendment so that the transport company could be entitled to operate on the new shuttle bus routes.

- **Public Transport Company (Principle participant)**:

  - in charge with signing the contracts with CET and METRO for shuttle bus services;

  - in charge with providing vehicles for the shuttle bus service;

  - in charge with keeping track of passenger numbers and impacts on traffic flow.

- **Shuttle bus companies (Principal participants)**: CET and METRO signed the contracts for shuttle bus services.

- **Technical University (Occasional participant)** – in charge with organising surveys by face-to-face interviews for measure assessment.

D.3.2 Stakeholders

- **Employees:** CET and METRO employees benefit directly from these shuttle bus services, so they do not need to change means of transport to move between home and work anymore.
- **Other traffic participants** – the use of shuttle bus service by a high number of employees means less personal cars on the roads, hence improved traffic flow.

D.4 Recommendations

D.4.1 Recommendations: measure replication

- **Study of access to public transport by employees of large companies.** There are several patterns according to which the transport system in cities and in their surroundings is organised. Depending on what public transport (including short-distance trains) offers and on where the large companies outside the cities are located, the rate of success of trying to replicate shuttle bus services may differ significantly from one city to another. The demand should be carefully studied before any investments are made.

D.4.2 Recommendations: process (related to barrier-, driver- and action fields)

- **Search for large companies located outside the city.** This type of transport service it is recommended especially to public transport companies in areas where buses do not operate outside the city and where there are no regional trains conveniently linking the city with the neighbouring localities, to investigate whether there are large companies located outside the city interested in shuttle bus services.
- **Calculate costs.** When such companies have been identified and all details of potential routes have been set, it is easy for the transport company to make an exact calculation of the costs involved. If the conclusion is positive and the legislation is favourable to this type of service, once a contract is signed, there are hardly any risks that may interfere with the success of the measure.

ANNEX 1

Shuttle service transport schedules for both companies.

Monday-Saturday schedule of METRO special bus route (Baza 3 – **to Metro**)

Bus Station	Hour
BAZA 3	4.40
SIRAJ	4.45
ROND VECHI CUG	4.50
PODU ROSU	4.55
CANTEMIR	5.00
PODU DE PIATRA	5.05
ALEXANDRU CEL BUN	5.10
ROND DACIA	5.15
COMAT	5.20
PACURARI	5.25
METRO	5.30
Number of Km	**19**

Monday-Sunday schedule of METRO special bus route (Dacia – **to Metro**)

Bus Station	Hour
ROND DACIA	6.15
ZIMBRU	6.20
FAMILIAL	6.25
PODU DE PIATRA	6.30
PODU ROSU	6.35
NICOLINA	6.40
ROND VECHI CUG	6.43
SIRAJ	6.50
BULARGA	6.55
BAZA 3	7.00
METALURGIE	7.03
TATARASI	7.05
BUCSINESCU	7.10
TG CUCU	7.15
INDEPENDENTEI	7.20
PACURARI	7.25
METRO	**7.30**
Number of Km	**43.5**

Monday-Saturday schedule of METRO special bus route (Metalurgie – **to Metro**)

Bus Station	Hour
METALURGIE	4.50
DOI BAIETI	4.55
TATARASI	5.00
BUCSINESCU	5.05
TG CUCU	5.10
INDEPENDENTEI	5.15
PACURARI	5.20
METRO	5.30
Number of Km	**15**

Monday-Sunday schedule of METRO special bus route (Baza 3 – **to Metro**)

Bus Station	Hour
BAZA 3	6.40
SIRAJ	6.45
ROND VECHI CUG	6.50
PODU ROS	6.55
CANTEMIR	7.00
PODU DE PIATRA	7.05
ALEXANDRU CEL BUN	7.10
ROND DACIA	7.15
COMAT	7.20
PĂCURARI	7.25
METRO	**7.30**
Number of Km	**19**

Monday-Sunday schedule of METRO special bus route (Metalurgie – **to Metro**)

Bus Station	Hour
METALURGIE	6.50
DOI BĂIEȚI	6.55
TĂTĂRAȘI	7.00
BUCȘINESCU	7.10
TG. CUCU	7.15
INDEPENDENȚEI	7.20
PĂCURARI	7.25
METRO	**7.30**
Number of Km	**15**

Monday-Saturday / Sunday schedule of METRO

Monday-Saturday / Sunday schedule of METRO special bus route (Baza 3 – **to Metro**)

Bus Station	Hour
BAZA 3	12.30
SIRAJ	12.40
ROND VECHI CUG	12.45
PODU ROSU	12.50
CANTEMIR	12.55
PODU DE PIATRA	13.10
ALEXANDRU CEL BUN	13.15
ROND DACIA	13.25
COMAT	13.30
PACURARI	13.35
METRO	**13.45**
Number of Km	**19**

Monday-Saturday schedule of METRO special bus route (**from Metro** – Baza 3)

Bus Station	Hour
METRO	14.30
PACURARI	14.35
COMAT	14.40
ROND DACIA	14.45
ALEXANDRU CEL BUN	14.50
PODU DE PIATRA	14.55
CANTEMIR	15.00
PODU ROSU	15.05
ROND VECHI CUG	15.10
SIRAJ	15.15
BAZA 3	15.20
Number of Km	**21.5**

Monday-Saturday schedule of METRO special bus route (**from Metro** – Baza 3)

Bus Station	Hour
METRO	16.30
COMAT PĂCURARI	16.40
PĂCURARI	16.45
ROND DACIA	16.50
ALEXANDRU CEL BUN	16.55
PODU DE PIATRĂ	17.00
CANTEMIR	17.05
PODU ROS	17.10
ROND VECHI CUG	17.20
SIRAJ	17.25
BAZA 3	17.30
Number of Km	**21,5**

Monday-Saturday schedule of METRO

special bus route (Metalurgie – **to Metro**)

Bus Station	Hour
METALURGIE	13.00
DOI BAIETI	13.05
TATARASI	13.10
BUCSINESCU	13.15
TG CUCU	13.20
INDEPENDENTEI	13.25
PACURARI	13.35
METRO	**13.45**
Number of Km	**15**

Monday-Saturday schedule of METRO special bus route (**from Metro** – Metalurgie)

Bus Station	Hour
METRO	16.30
PĂCURARI	16.35
INDEPENDENȚEI	16.40
TG.CUCU	16.45
BUCȘINESCU	16.50
TĂTĂRAȘI	16.55
DOI BĂIEȚI	17.00
METALURGIE	17.05
Number of Km	**17,5**

Monday-Saturday schedule of METRO special bus route (**from Metro** – Baza 3)

special bus route (**from Metro** – Letcani)

Bus Station	Hour
METRO	22.30
LETCANI	22.35
METRO	22.40
Number of Km	**10**

Monday-Saturday schedule of METRO

special bus route (**from Metro** – Letcani)

Bus Station	Hour
METRO	22.45
PĂCURARI	22.50
ROND DACIA	22.55
ALEXANDRU CEL BUN	23.00
GALATA	23.05
PODU ROS	23.15
Number of Km	**24**

Monday-Sunday schedule of CET

special bus route (P-ta Dacia – **to CET**)

Bus Station	Hour
PIAȚA DACIA	6.00
PODUL DE PIATRĂ	6.05
PODU ROȘU	6.10
CUG 1	6.15
POITIERS	6.20
MOLDOMOBILA	6.25
DOI BĂIEȚI	6.30
DANCU	6.40
CET II	6.50
Number of Km	**30.50**

Monday-Sunday schedule of CET

special bus route (P-ta Dacia – **to CET**)

Bus Station	Hour
PIAȚA DACIA	14.00
PODUL DE PIATRĂ	14.05
PODU ROȘU	14.10
CUG 1	14.15
POITIERS	14.20
MOLDOMOBILA	14.25
DOI BĂIEȚI	14.30
DANCU	14.40
CET II	**14.50**
Number of Km	**30.50**

Monday-Sunday schedule of CET

Bus Station	Hour
METRO	22.45
PĂCURARI	22.50
MOARA 1 MAI	22.55
GARA	23.00
PODU DE PIATRĂ	23.05
PODU ROȘU	23.10
ROND VECHI CUG	23.15
SIRAJ	23.20
BULARGA, BAZA3	23.25
Number of Km	**26**

Monday-Saturday schedule of METRO

special bus route (**from Metro** – Baza 3)

Bus Station	Hour
METRO	22.45
PĂCURARI	22.50
INDEPENDENȚEI	22.55
TG.CUCU	23.00
BUCȘINESCU	23.05
TĂTĂRAȘI	23.10
DOI BĂIEȚI	23.15
METALURGIE	23.20
Number of Km	**24**

Monday-Sunday schedule of CET

special bus route (P-ta Dacia – **to CET**)

Bus Station	Hour
PIAȚA DACIA	6.10
PODUL DE PIATRĂ	6.15
PODU ROȘU	6.20
CUG1	6.30
POITIERS	6.35
MOLDOMOBILA	6.40
BAZA3	6.45
ZONA INDUSTRIALĂ	6.50
TOMEȘTI	7.00
CET II HOLBOCA	**7.15**
Number of Km	**43**

Monday-Sunday schedule of CET

special bus route (P-ta Dacia – **to CET**)

Bus Station	Hour

special bus route (**from CET** – P-ta Dacia)

Bus Station	Hour
CET II	**7.15**
DANCU	7.25
DOI BĂIEȚI	7.35
BAZA 3	7.40
MOLDOMOBILA	7.45
POITIERS	7.50
CUG 1	7.55
PODU ROȘU	8.00
PODUL DE PIATRĂ	8.05
PIAȚA DACIA	8.10
Number of Km	**30.50**

Monday-Sunday schedule of CET

special bus route (**from CET** – P-ta Dacia)

Bus Station	Hour
CET II HOLBOCA	**15.05**
TOMEŞTI	15.20
ZONA INDUSTRIALĂ	15.30
BAZA 3	15.35
MOLDOMOBILA	15.40
POITIERS	15.45
CUG 1	15.50
PODU ROȘU	15.55
PODUL DE PIATRĂ	16.00
PIAȚA DACIA	16.05
Number of Km	**43.00**

Monday-Sunday schedule of CET

special bus route (**from CET** – P-ta Dacia)

Bus Station	Hour
CET II	22.15
DANCU	22.25
DOI BĂIEȚI	22.35
BAZA 3	22.40
MOLDOMOBILA	22.45
POITIERS	22.50
CUG 1	22.55
PODU ROȘU	22.00
PODUL DE PIATRĂ	22.05
PIAȚA DACIA	22.10
Number of Km	**30.50**

PIAȚA DACIA	21.00
PODUL DE PIATRĂ	21.05
PODU ROȘU	21.10
CUG 1	21.15
POITIERS	21.20
MOLDOMOBILA	21.25
DOI BĂIEȚI	21.30
DANCU	21.40
CET II	**21.50**
Number of Km	**30.50**

Monday-Sunday schedule of CET

special bus route (**from CET** – P-ta Dacia)

Bus Station	Hour
CET II HOLBOCA	**15.15**
DANCU	15.25
DOI BĂIEȚI	15.35
BAZA 3	15.40
MOLDOMOBILA	15.45
POITIERS	15.50
CUG 1	15.55
PODU ROȘU	16.00
PODUL DE PIATRĂ	16.05
PIAȚA DACIA	16.10
Number of Km	**30.50**

ANNEX 2

Questionnaire – After situations

M. 15 – Business district shuttle bus

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.
5. How often do you use public transport? (How many times a week/a month/occasionally ...)
   _____
6. How do you find the idea that led to the creation of shuttle services for commuters through the CIVITAS project?
   1□ very bad 2□ bad 3□ not bad 4□ good 5□ very good
7. What means of transport do you use mostly for travelling between home and work:
   □ personal car □ shuttle buses□ other (bicycle, walking, etc.) _____
8. To what extent do you agree with the following statements (with a grade from 1 to 5, where 1 has the meaning "total disagreement" and 5 "total agreement")

The large number of private cars contribute to pollution increase in the city.	1 2 3 4 5
The transport company offers commuters viable transport solutions for moving between home and work	1 2 3 4 5
The special routes for commuters created by the transport company encourages the use of public transport instead of the personal car	1 2 3 4 5

9. How satisfied are you with the following aspects of the services offered by the transport company with respect to the shuttle buses for commuters?

	very satisfied	satisfied	almost satisfied	dissatisfied	very dissatisfied
Travel time	□	□	□	□	□
Transport conditions	□	□	□	□	□
Route coverage	□	□	□	□	□

10. In what areas of Iasi do you think that special lines should be extended to cover commuters' needs?

11. Do you have any suggestions for improving the services for people forced to commute using public means of transport?

Thank you!

Executive summary

It is known that a historical area of a city attracts tourists from all over the countries. The older the houses, the churches, the monasteries and other buildings that represent tourist attractions, the greater the number of tourists. Historic centres are also attractive for the city's inhabitants to spend quality time there, walking or cycling, after work and in weekends. These are only a few reasons for which it is imperative to preserve the architecture of a city's historical centre, and there are many ways to do that. Before the ARCHIMEDES project, the Municipality of Iasi had begun with rehabilitating the tram tracks in the area, which led to a reduction of vibrations and noise.

The ARCHIMEDES project made it possible that the measures started towards the preservation of the historical centre would be continued. In this direction, the access of vehicles in that area was restricted to the maximum weight of 1.5 t/axle and the speed was restricted to 30 km/h. Moreover, after discussions with the companies that have business activities in the area, supplying activities have been restricted to the time intervals: 7 a.m. - 9 a.m. and 3 p.m. - 5 p.m.

Several methods were used in the evaluation process to obtain the indicators set for this measure:

- Surveys were carried out to determine some of the evaluation indicators. The results of the assessment are:
  - the awareness level shows that in 2009, before the implementation phase, only 19% of the interviewed persons had heard about the measure; after the implementation the percentage increased to 46% in 2011 and to 64% in 2012;
  - the acceptance level indicator reveals that the percentage of persons who did not regard the historical centre as an attractive place decreased from 76% in 2009 to 52% in 2012. Most of them agreed with the access restriction within this area: 77% in 2009, 82% in 2011, and 90% in 2012;
- the result of counting private cars indicates that in 2012 the number of private cars which crossed the historic centre decreased by 92% at peak hours and by 91% off-peak hours compared to 2009, because of restrictions, which made drivers use routes adjacent to the historic centre.
- the result of counting goods vehicles moving in the historic centre shows that, due to the constraints with respect to time intervals imposed on supply activities the number of goods vehicles moving in the area decreased from an average of 43 recorded in 2009 to an average of 10 in 2011 (reduction by almost 77%), and of 7 in 2012 (almost 84%)
- after specific measurements were made, the following evolution of the value of the indicators was noticed in 2012 compared to the values recorded in 2009:
  - a decrease in the level of CO, both during daytime and during the night, by 7.7% and 8.4%, respectively.
  - the level of NO_2 decreased as well, both during daytime and during night time, by 7.5% and 9.5%, respectively.
  - the noise level indicator had the same descending trend: it decreased during daytime and during the night by more than 7.9% and 3.7%, respectively.

The following can be regarded as lessons that were learned during the implementation of this measure:

- in order for the measure to be a success, when restrictions are imposed on certain road sectors, the solutions for traffic redirection on adjacent roads must be carefully considered, so that the transition to the new situation be easily accepted by drivers.
- stakeholders should be involved in the process of the measure implementation, and its advantages should be clearly explained to them.

From the perspective of the impact on the city, the conservation of the historic centre of Iasi means preserving the cultural identity of the city, attracting tourists, and improving the quality of life, as the area is less polluted, and more appropriate for leisure activities.

IAS 22 - Access Control to a Historic Centre

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To preserve the historic centre of Iasi.

(B) Strategic level:

- To promote the use of public/soft mode of transportation – trams, cycling and walking – within this area.

(C) Measure level:

- To implement an access control scheme for the historical area.
- To reduce pollutant emissions as a consequence of the decrease of the number of private cars and goods vehicles transiting the area.

A1.2 Target groups

The target groups are the people living in the old buildings in the historical area, the tourists visiting this area and other inhabitants of the city who want to spend their spare time in the historic centre.

A2 Description

The historic centre of a city means old buildings, monuments and old street infrastructure, which become with the time more and more affected by vibrations and by the pollution specific to most cities. Strict measures have to be taken for the conservation of historic areas at each level, from city's authorities to its inhabitants.

In this respect, the Municipality of Iasi has recently modernised the tram infrastructure in the historic area, and then through this measure it has implemented a control scheme which restricts vehicle access in this area. Access is allowed only to emergency services, trams, cyclists, and pedestrians during the day. The Municipality has started the cooperation with the central post office, which is located in the historical area, in order to achieve the objectives of this measure. A supply program has been drawn for this area, to which ARCHIMEDES contributes by planning and evaluating the scheme.

A3 Person in charge for evaluation of this measure

Names of persons	Crihan Daniela - implementation
	Carmen Gherca - evaluation
Name of organization	IASI, PTI
Direct telephone	+40332440572
e-mail	informatizare@ratp-iasi.ro

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – The pollution, noise and vibrations that affect the old buildings within the historical centre of Iasi have been a problem for a long time. The implementation of this measure is meant to help keeping the old architecture of the city.
- **New mode of transport exploited** – Promotion of public/soft mode – trams, cycling, and walking.
- **New organizational arrangements or relationships** – in order to implement this measure, the Municipality of Iasi has developed relationships with the postal office and with the shopping places in the historic area to create an access control scheme for supplying/distribution activities.

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

The traffic in the historic centre of Iasi was not restricted. Goods distribution vehicles and trams moving on bad infrastructure created vibrations, noise and pollutant emissions, which were equally harmful for the environment, for citizens, and for the old buildings within the area.

B4 Actual implementation of the measure:

Stage 1: Restricted access for animals and special vehicles (*September 2009***)** - Decision no. 198, which organises road traffic in the city of Iasi, was approved by the Local Council of Iasi in 2000. Nine years later, on September 29th, 2009, Decision no. 418 was approved, which modified article 14 of Decision no. 198/2000. Thus, the access of animal-drawn vehicles and of machinery used for construction, agricultural or forestry works within the boundaries of Iasi was denied.

Stage 2: Parking restriction (*May 2010*) - Local Council Decision no. 153/2010 forbid parking of the following vehicles on public domain: vehicles or vehicle assemblies (i.e. including a trailer) of over 5.2 m in length, trailers that are not linked to motor vehicles, tractors used in agricultural and forest exploitation, vehicles used for services and miscellaneous tasks (e.g. special vehicles for funeral services). These categories of vehicles can now be legally parked only in special places belonging to their owners or to their authorised users.

Stage 3: Speed and weight restriction (*August 2010*) - The speed (30 km/h) and weight (1.5 t / axle) restriction in the historical centre of Iasi requested by the Direction for Development and European Projects of the Municipality of Iasi was approved after a debate within the meeting of the City Commission for Traffic on August 30, 2010. Traffic signs were then purchased and mounted. After meetings organised with the businesses based or active in the historical area of the city, and taking into consideration the positive reaction of residents, a time-based scheme for the distribution of goods was approved.

Stage 4: Air quality and noise measurement (*baseline - December 2009 and after data - June 2011 and June 2012*). Within the above mentioned periods, air quality and noise were measured within the historical centre.

Stage 5: Evaluation (*November 2009, February 2011 and February 2012*) – Surveys were carried out by face-to-face interviews and vehicles belonging to three categories (private cars, goods vehicles and trams) were counted.

The buildings in the historical centre of Iasi – shops, offices, schools, administrative buildings – accommodate a variety of activities, which makes the area (Fig. 1, Fig. 2) appropriate for pedestrian traffic. NGOs defending the interests of the community and condominium associations requested the Municipality of Iasi to forbid car access in the historical centre with a view to reducing pollution caused by exhaust gases and noise, and to increasing the attractiveness of the area for tourists and passers-by. The survey conducted by the National Association of Students from Public Administration Schools – Romania for the application form for another European project initiated by Iasi had led to the same conclusion: that the historic centre of Iasi had to be preserved.

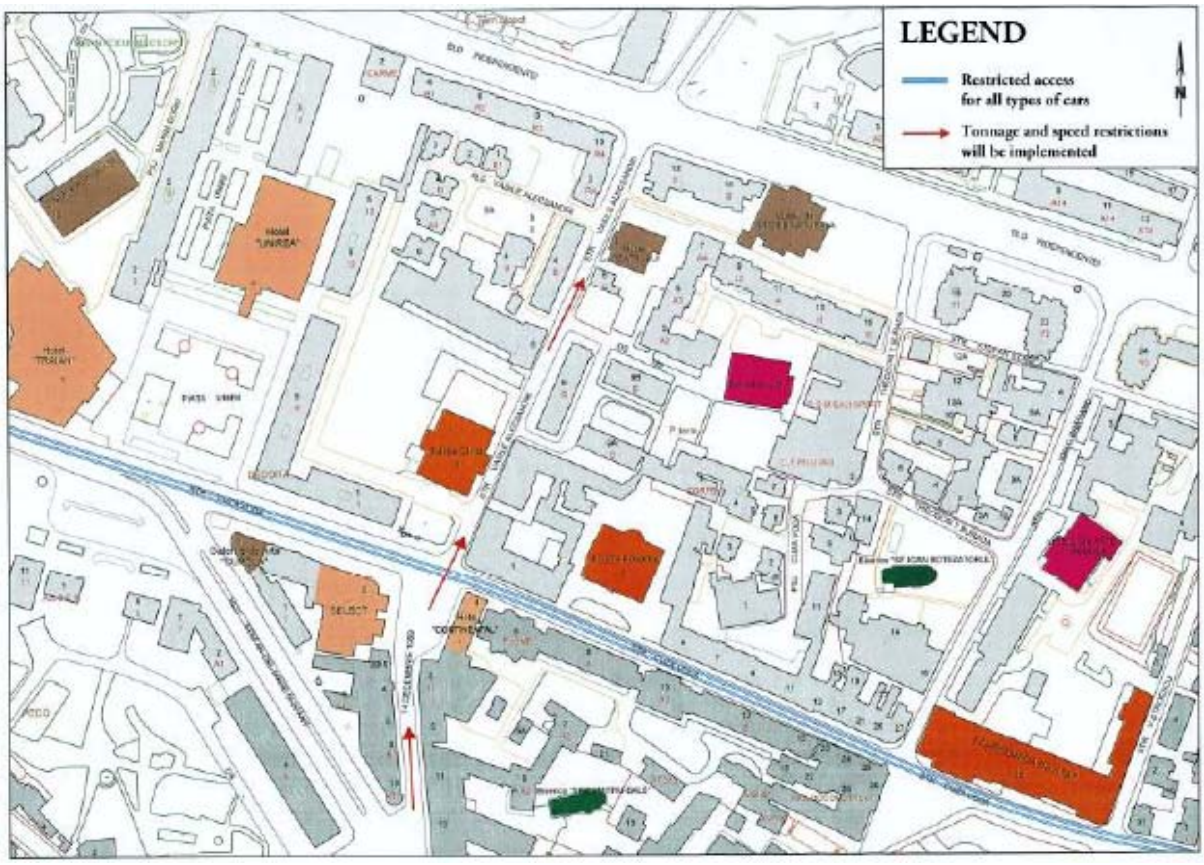


Fig. 1 Historical centre of Iasi

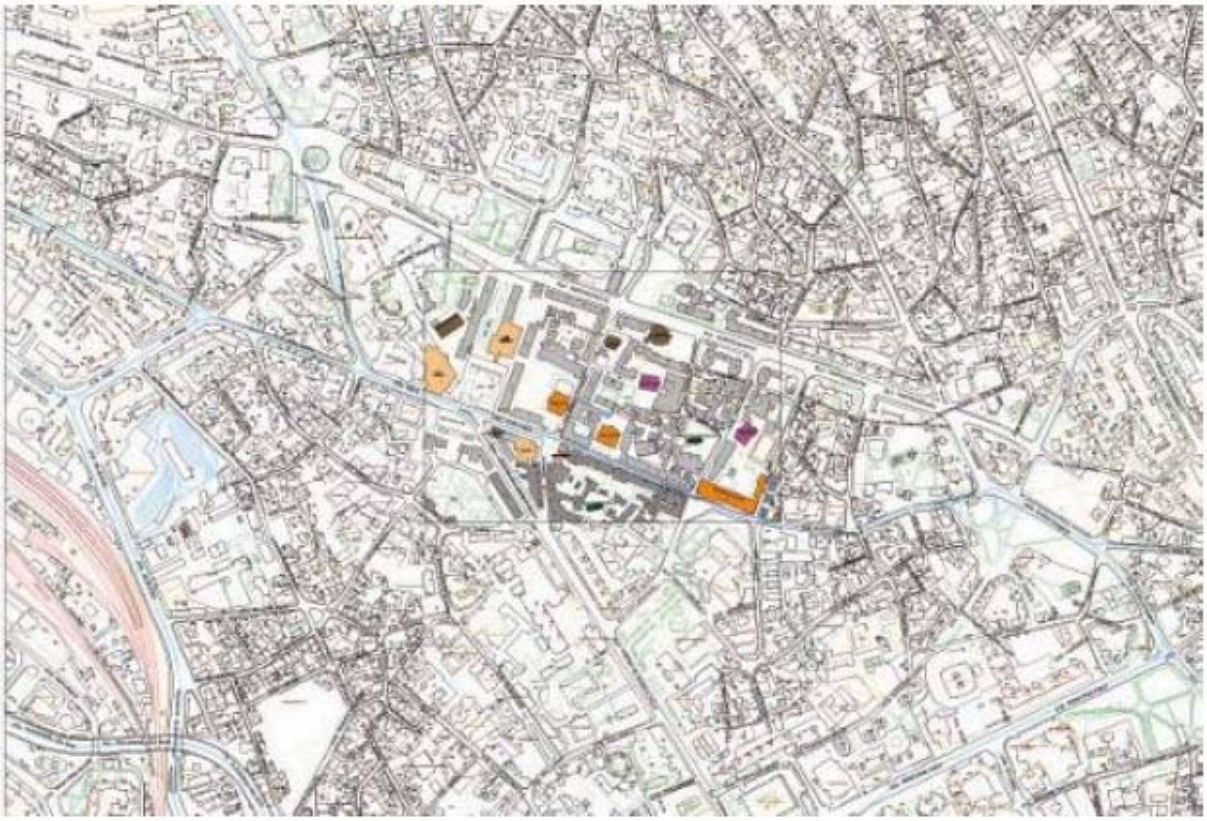


Fig. 2 The area in a larger urban context

Several activities were initiated for this purpose, and they were included in the Access Restriction Scheme for the Historical Centre of the City of Iasi.

In 2000, the city's Local Council approved Decision no. 198 in order to organise road traffic in the city of Iasi. Nine years later, on September 29th, 2009, Decision no. 418 was approved, which modified article 14 of Decision no. 198/2000 so that to deny access of animal-drawn vehicles and of machinery used for construction, agricultural or forestry works within the boundaries of Iasi and to place signs indicating the penalties if the above-mentioned restrictions are not observed (the fine is between 500 lei and 1000 lei).

Along the same line of action, in 2010 the Local Council of the city of Iasi approved Decision no. 153, which forbids parking of the following vehicles within the public domain of the city:

- vehicles or combination vehicles longer than 5.2 m,
- trailers which are not attached to a vehicle,
- tractors used in agricultural and forestry works,
- vehicles intended for maintenance and services.

The parking of these types of vehicles is allowed only in places which are in possession of the owner or of the certified holder of the vehicles.

Fig. 3 Speed restrictions in the historical centre of the city of Iasi

The speed and weight of the vehicles transiting the historical centre of Iasi had to be restricted as part of a second phase. The Municipality of Iasi has therefore transmitted formal requests for approval to the City Commission of Traffic, to the Traffic Police and to the Direction of Public Services of Iasi. Some of the streets included in these requests are located within the historical centre, e.g. V. Alecsandri street, Cuza Vodă street and Lăpuşneanu street. The approval of the City Traffic Commission has been requested in order to restrict car access in the area of Vasile Alecsandri and 14-15 December 1989 streets to the maximum speed of 30 km/h and with the maximum weight of 1.5 t/axle.

As commented previously, the speed and weight restrictions in the historical centre of Iasi requested by the Direction for Development and European Projects of the Municipality of Iasi were approved after debate within the meeting of the City Commission of Traffic on August 30, 2010 (Fig. 3). Traffic signs were then purchased and mounted within the area.

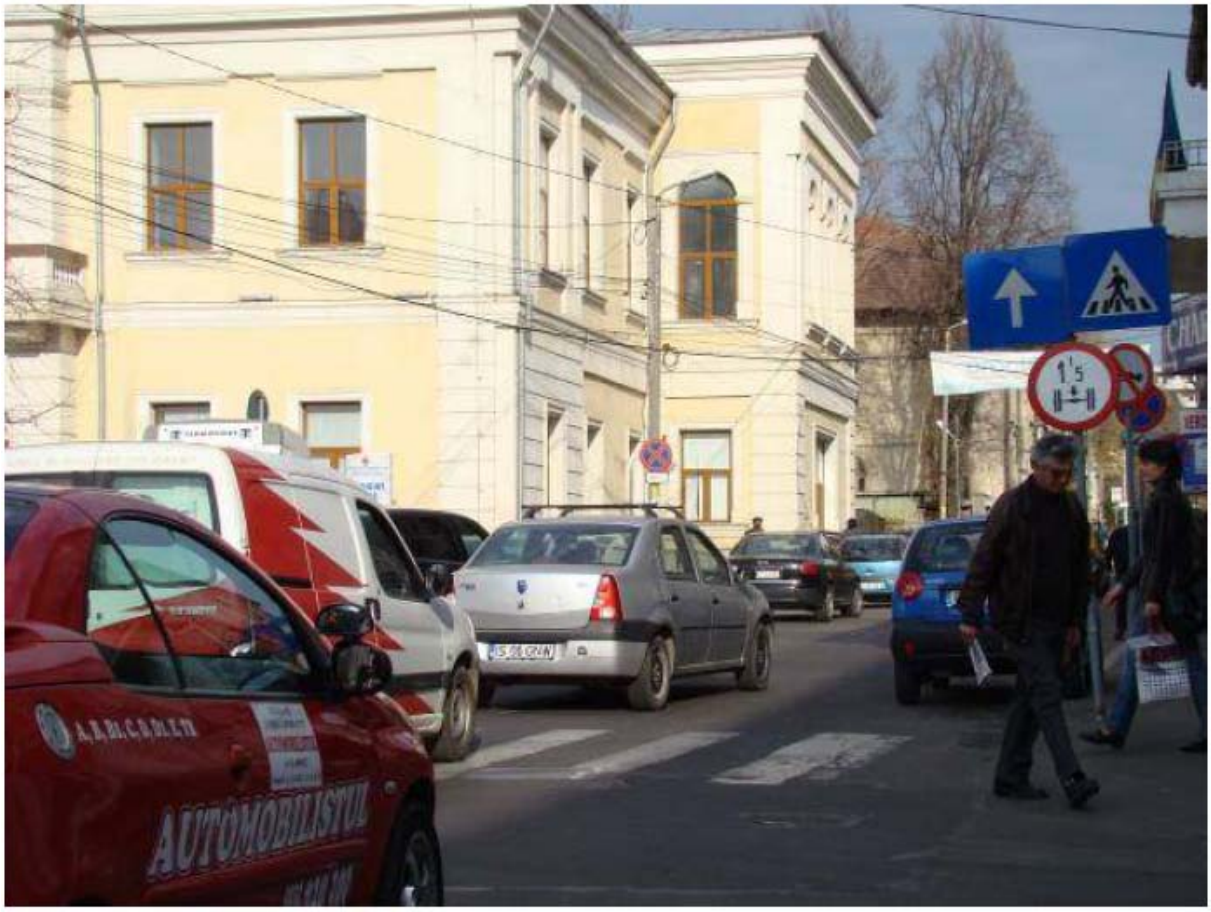


Fig. 4 Weight restrictions in the historical centre of the city of Iasi

As part of the same issue of access restriction in the historical centre of Iasi, the problem of traffic generated by the supply activities of the post office located in this central area had to be included. The hours when supply activities took place coincided with the peak traffic hours. As a result of negotiations, the supply programme was correlated with the programme set by the strategy of improving the distribution of goods so that the access of vehicles used for supplying the post office would be forbidden in the time intervals 7 a.m. - 9 a.m. and 3 p.m. - 5 p.m.

The Access Restriction Scheme for the Historical Centre of the City of Iasi was drawn up and implemented. The approval of the City Commission of Traffic for speed and weight restriction to 30 km/h and 1.5 T/axle, respectively, was granted (Fig. 4). Negotiations were conducted with the post office in order to make a time-based scheme of the supply activities that would meet the strategy of the distribution of goods, which meant restricting supply vehicle access within the time intervals 7 a.m. - 9 a.m. and 3 p.m. - 5 p.m. The meetings organised with the businesses based or active in the area and the reaction of the residents have shown a positive attitude, they have accepted easily the restriction proposed, being aware of its positive impacts.

The traffic of the types of vehicles that are now prevented from entering in the restricted area was deviated to several roads with no immediate apparent bad consequences. This has been further investigated as part of the measure evaluation.

Articles related to the implementation of the measure have been published on the website of the Iasi City Hall (see Annex 1). Posters presenting information on the measure were displayed in the historical centre of the city (see Annex 1). Moreover, informative meetings were organised for the businesses based within the area.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measures B&H 21 –** Clear zone in Brighton & Hove –, **DSS 23 –** Changing parking behaviour in Donostia – San Sebastian and **DSS 65**, organizing the urban distribution in the Old part of the City. Other cities such as Brighton & Hove and Usti nad Labem had introduced similar access control measures.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of impact

The main impact of this measure, at social level, is the increase of the attractiveness of the historical centre both among tourists, as well as among the inhabitants of the city – pedestrians and cyclists. By promoting the measure, by encouraging people to use soft modes of transport and by reducing the number of goods vehicles a big step has been made in the direction of protecting the environment in this area by reducing pollutant emissions, noise and road traffic.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ENVIRONMENT					
5		**Pollution/Nuisance**	Air Quality	CO levels	CO concentration	Ppm or g/m3, quantitative, measurement
6				NO2 levels	NO2 concentration	Ppm or g/m3, quantitative, measurement
12			Noise	Noise perception	Perception of noise	Measurement
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
	TRANSPORT					
21		**Transport System**	Traffic Levels	Traffic flow by vehicle type - peak	Average vehicles per hour by vehicle type - peak	Veh per hour
22				Traffic flow by vehicle type - off peak	Average vehicles per hour by vehicle type – off peak	Veh per hour
25			Freight Movements	Goods vehicles moving in demo areas	Daily number of goods vehicles moving in area	Number

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
5	CO levels	A lower value after implementation compared with the value registered before implementation	Measurements in the historic centre of the city were made with a mobile monitoring station before and after the measure was implemented.	Before - December 2009 After - June 2011 and June 2012
6	NO_2 levels			
12	Noise perception			
13	Awareness level	Increased	Surveys were conducted on 100 persons each time to assess these indicators. The interviews* were carried out by students in the historic centre of the city during five days (three working days and two days at the weekend). **November 2009.** The respondents were asked if they had heard about the CIVITAS project and if they had known that through this measure the historic centre of Iasi was going to become an area where vehicle weight and speed are restricted (awareness level). For the assessment of the acceptance indicator the respondents were asked, among others, if there were too many vehicles moving in the historic centre, if it was a noise polluted area and a dangerous place for pedestrians and cyclists. **February 2011 and February 2012.** Another set of 100 questionnaires was used for face-to-face interviews in both cases. Students conducted the survey in the same place as in 2009. The questions for the assessment of the awareness and if the acceptance levels remained the same but they were adapted to the stage the measure was in (already implemented).	Before - November 2009 After - February 2011 and February 2012
14	Acceptance level	Increased		
21	Traffic flow by vehicle type - peak hours	A lower number of vehicles after implementation compared with the number registered before implementation	The counting was performed within the historic centre by two persons: one counted the private cars and the other the trams that transited the area during peak hours and off peak hours.	
22	Traffic flow by vehicle type - off peak hours	A lower number of vehicles after implementation compared with the number registered before implementation		
25	Goods vehicles moving in demo areas	A lower number of vehicles after implementation compared with the number registered before implementation	Counting the number of the goods vehicles in the city historic centre	

* The questionnaire is to be found in Annex 2.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	5, 6, 12	M 16	IASI – Cornel Dumitriu PTI – Carmen Gherca
	13,14,21,22,25	M 15	
Collection of after data	5, 6, 12	M 34, M 46	IASI – Cornel Dumitriu PTI – Carmen Gherca
	13,14,21,22,25	M 30, M 42	
D 12.2 Baseline and first results from data collection	All indicators	Month 34	Stoica Cristian
D12.3 Draft results template available	All indicators	Month 45	
D12.4 Final version of results template available	All indicators	Month 49	

C1.2 Establishing a baseline

Before 2009 the historical centre of the city had suffered damages because of the vibrations produced by trams and supply vehicles. After many complaints and warnings of people and some institutions, the Iasi City Hall began a preservation program for this area. Thus the tram infrastructure has been modernised, and with the help of this project the access of supply vehicles has been restricted to certain hours.

For the evaluation process the following indicators were collected before and after the measure has been implemented:

- Traffic flow by vehicle type - peak hours / off-peak hours - The vehicles were counted during five days in the same location each year (Cuza Voda street).
- Goods vehicles moving in demo areas - The vehicles were counted during five days, in the same location each year (Cuza Voda street).
- CO levels, NO_2 levels and noise perception – the results of the measurements were interpreted by the Management Department of the Faculty of Machine Construction and Industrial Management of the Technical University.
- In order to assess the awareness level and the acceptance level surveys among passengers were conducted.

  The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

  The interviews were carried out in the historic centre of the city during five days (three working days and two days in the weekend) in the three periods the surveys took place, once before and twice after implementation. The 100 respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews. The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

  We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level. At the beginning of the ARCHIMEDES project, part of the representatives of the Municipality of Iasi involved in this project, together with representatives of the public transport company and of the Technical University of Iasi had a meeting with a group of students. These were broadly informed about the ARCHIMEDES project and about the measures that were going to be implemented. They were also told that face-to-face interviews with inhabitants of the city of Iasi were going to be conducted in order to fill in questionnaires that would assess the impact of the measures on them. Part of the students volunteered to conduct these interviews. For each measure, one group of two students was formed to complete the task. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working

days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses. The representatives of the three institutions decided that also 100 persons were to be interviewed after the measures had been implemented. The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

C1.3 Methods for Business as Usual scenario

If the measure had not been implemented, the great number of private and business cars would have caused heavy traffic that would have affected the pedestrians and the cyclists transiting this area, as well as the old buildings because of pollutant emissions and noise. Thus the historic area would not have been attractive anymore.

C2 Measure results

C2.1 Environment

The measurements for determining the environmental characteristics (pollutants and noise) are part of the Study of Emission Levels, which is a task implemented through Measure IAS 5 – LPG buses. A specialised company performed these measurements.

Air quality and noise level were measured by a specialised company on Cuza Voda street, in the area of the historic centre, next to the post office. Measurements were made using authorised devices.

- All air quality measurements were made in one day, but six samples were collected for each type of pollutant (CO and NO_2): three during the day and three during the night; the results used in the evaluation process are their arithmetical mean.
  Air quality measurements were performed at a height of 1.5 metres from the ground using the following devices: automatic analyser PHOCHECK 5000 Ex for NO_2 and automatic analyser DRÄGER X-am 7000 for CO.
- The measurements of noise level took place in the same conditions; the difference is that eight samples were collected, four during the day and four at night; the results used in the evaluation process are their arithmetical mean The noise level was measured with a RION NL-32 sonometer.

Table C2.1.1: Emissions Results

Indicator	Before 2009		After 2011		After 2012	
	12a.m.-2.30 p.m	23p.m.-0.45a.m	12a.m.-2.30 p.m	23p.m.-0.45a.m	12a.m.-2.30 p.m	23p.m.-0.45a.m
5, CO levels (mg/m^3)	1.333	0.797	1.258	0.749	1.231	0.730
6, NO_2 levels (mg/m^3)	1.34	1.11	1.26	1.05	1.24	1.004

The measurements for determining the CO and NO_2 levels were made within a day during two time intervals: 12.00-14.30 and 23.00-0.45. The mean value of the emissions and the amplitude (the difference between the maximum and the minimum values measured) were then calculated for each location and each time interval.

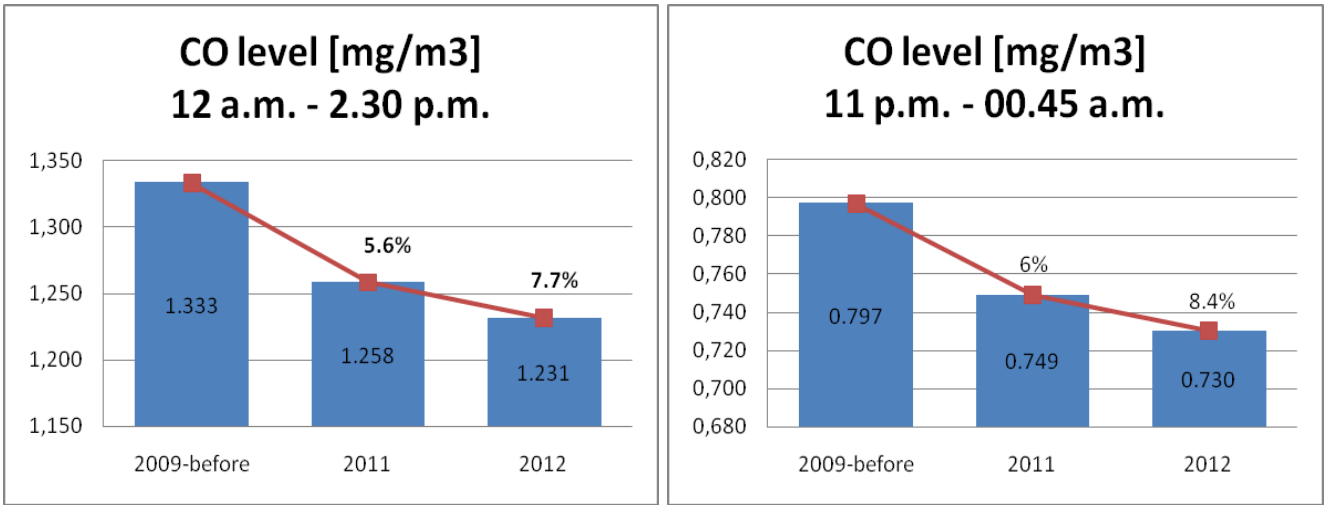


Fig. 5 CO levels during daytime and during night time

Fig. 5 shows notice that the level of CO during daytime decreased in 2011 by 5.6% and in 2012 by 7.7% compared to the value recorded in 2009, before the implementation phase. The level of CO during the night had the same descending trend: it decreased by 6% in 2011 and by 8.4% in 2012 compared to the value from 2009.

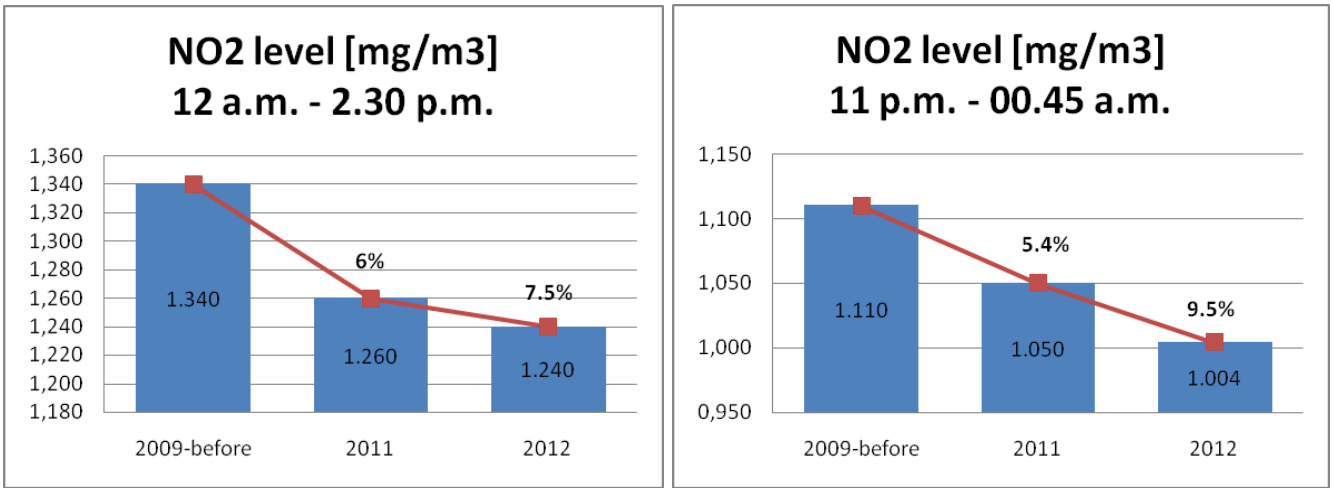


Fig. 6 NO_2 levels during daytime and during night time

After the measure was implemented, the levels of NO_2 decreased (Fig. 6) during daytime by over 6% in 2011 and by over 7.5% in 2012 compared to the value from 2009. The same happened during the night when the values decreased by 5.4% in 2011 and by 9.5% in 2012 compared to 2009.

Table C2.1.2 Noise level

Indicator	Before 2009		After 2011		After 2012	
	0:00 a.m.-0:30 a.m.	13:00p.m.-13:30p.m	0:00 a.m.-0:30 a.m.	13:00p.m.-13:30p.m	0:00 a.m.-0:30 a.m.	13:00p.m.-13:30p.m
12, Noise perception ($dB_{(A)}$)	67.125	70.275	63.98	68.13	61.3	67.645

The noise level was measured with a RION NL-32 sonometer on Cuza Vodă street (near the post office). Four measurements were made between 13.00-13.30 and other four between 0.00-0.30.

The mean value and the amplitude of the noise level are presented in Table C2.1.2.

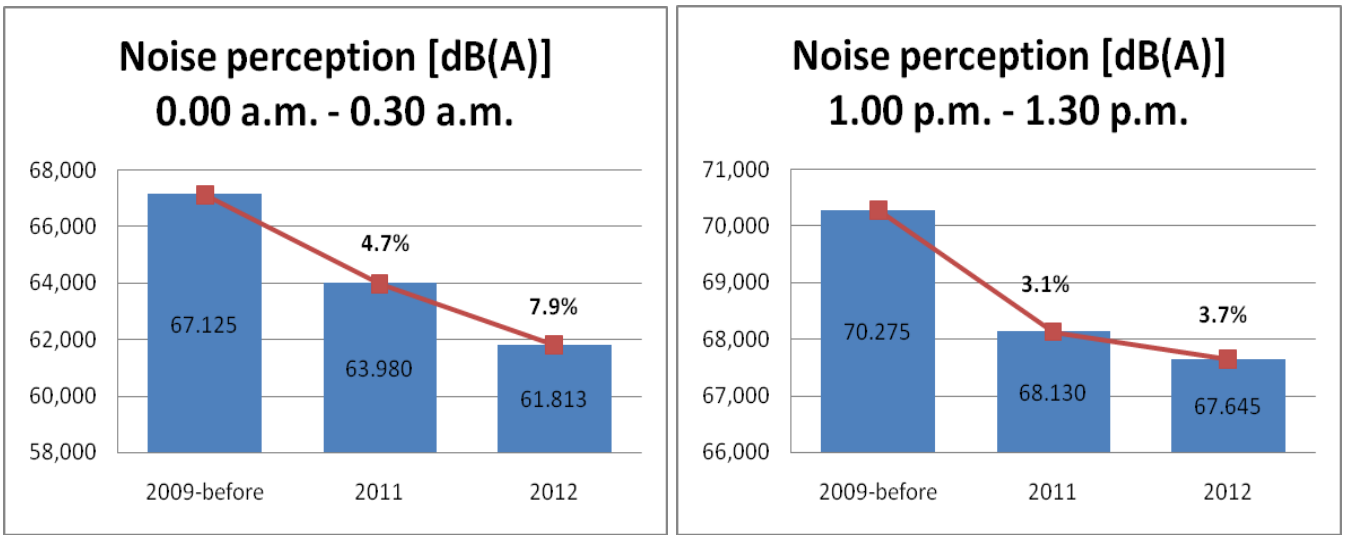


Fig. 7 Noise perception during daytime and during night time

The values of the noise perception indicator (Fig. 7) measured before and after the implementation phase were lower during daytime by over 4.7% in 2011 and by 7.9% in 2012 compared to the value measured in 2009. The values of the indicator decreased during the night by 3.1% in 2011 and by 3.7% in 2012 compared to 2009.

C2.2 Transport

Table C2.2.1 Traffic flow by vehicle type

Indicator	Before (2009)		After (2011)		After (2012)	
	Trams	P.C.	Trams	P.C.	Trams	P.C.
21. Traffic flow by vehicle type - peak hours(7 – 9 a.m.)	178	250	177	23	178	19
22. Traffic flow by vehicle type - off peak hours (10 a.m. – 12 a.m.)	104	323	102	30	103	28

For the assessment of this indicator two persons counted the private cars and the trams which ran along Cuza Voda street. This location was chosen because traffic was restricted along this street with the exception of trams and cars of the residents in the area. The vehicles were counted during peak hours and off peak hours during five days, then the average of the values collected was calculated for the two intervals of time.

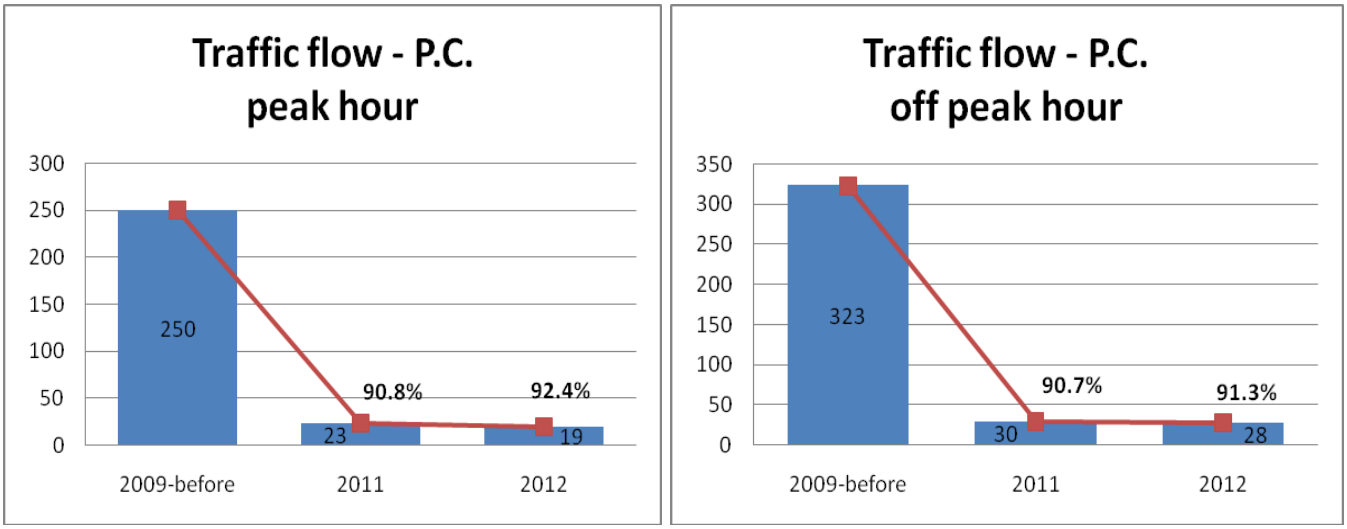


Fig. 8 Traffic flow indicator – private cars moving in the historical centre at peak and off peak hours

After the access of vehicles has been restricted within the historical centre, the number of private cars decreased significantly both at peak and off peak hours. In 2009 250 and 323 private cars were counted at peak hours and off peak hours in two-hour counting intervals, respectively, and in 2012 only 19, and 28, respectively (which means that over 92%, and 81%, respectively, of the drivers used routes adjacent to the historic centre).

Table C2.2.2 Goods vehicles

Indicator	Before (2009)	After (2011)	After (2012)
25. Goods vehicles moving in demo areas (10 a.m. – 12 a.m.)	43	10	7

The counting of goods vehicles was also performed on Cuza Voda street in the historic centre because there are many stores on the ground floor of the old buildings along this street, and the post office is also located there. According to the Access Restriction Scheme for the Historical Centre, the access of supply vehicles within the time intervals 7 a.m. - 9 a.m. and 3 p.m. - 5 p.m. is forbidden. The vehicles were counted during five days within the interval 10 a.m.-12, and the average of the results of each day was then calculated.

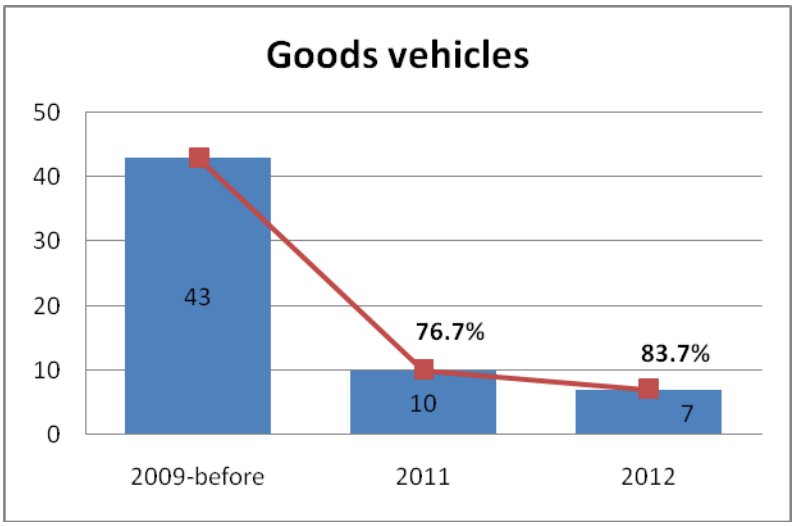


Fig. 9 Goods vehicle moving in city's historical centre

Imposing access restrictions and establishing time intervals for supply activities of companies located in the historical centre led to a decrease of the number of goods vehicles moving in the area from an average of 43 recorded during the counting process in 2009 to 10 in 2011 (decrease of over 76.7%), and 7 in 2012 (83.7%).

C2.3 Society

The interviews for determining the awareness level and the acceptance level indicators were carried out by students in the historic centre before, as well as after the implementation of the measure. The tables below provide a characterisation of the respondents (Fig. 10).

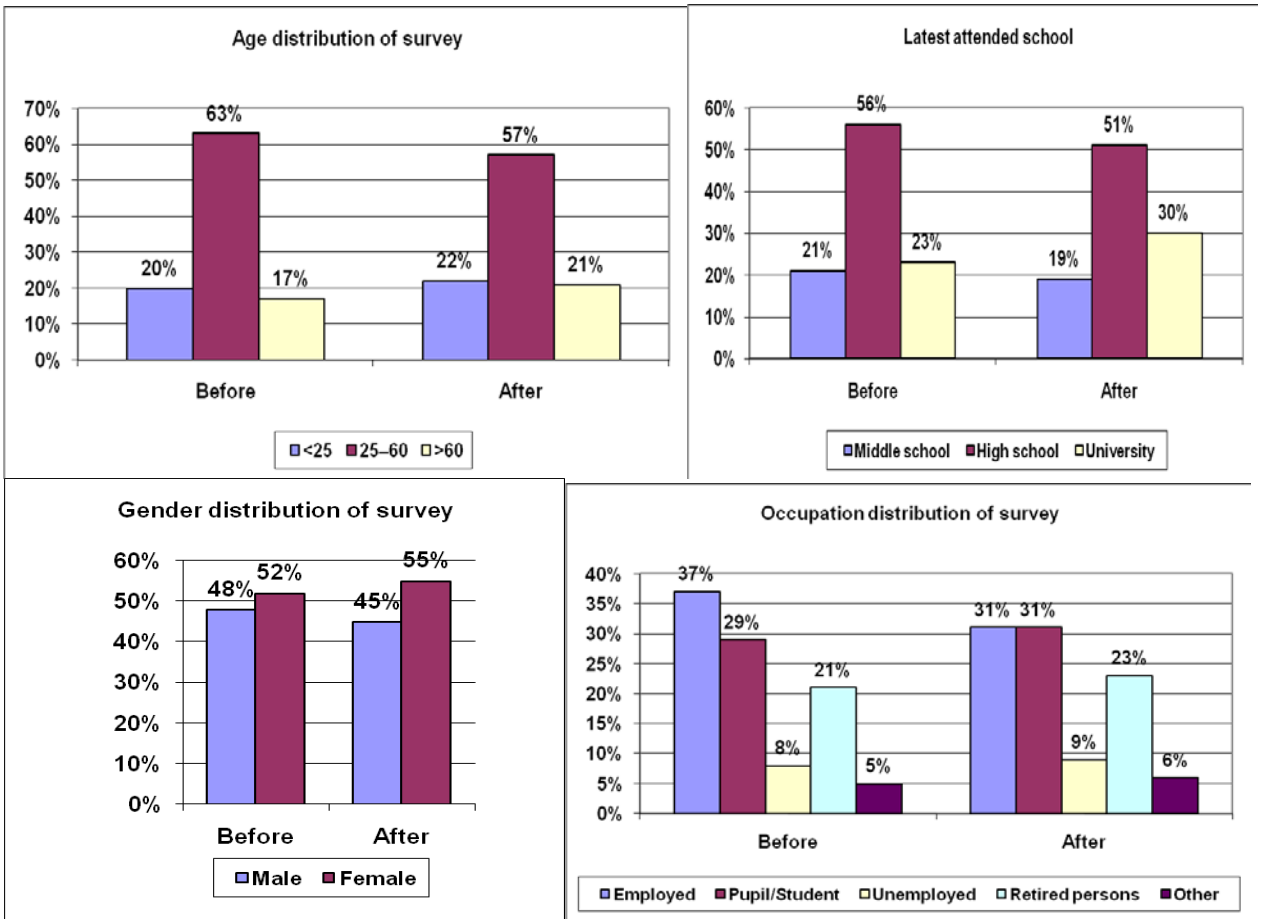


Fig. 10. Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 10), we notice the following evolutions in the "before" and "after" situations:

- in both situations, most of the interviewees are within the 25 to 60 year-old bracket (63% and 57%, respectively).
- most of them have attended high school (56% and 51%, respectively), and quite a high percentage have higher education (23% and 30%, respectively).
- most of the interviewees are female in both cases (over 52%).
- most of the respondents are employed (37% and 31%, respectively); then come school and university students (29% and 31%, respectively).

Table C2.3.1 Awareness level

Indicator		Before (2009)	After (2011)	After (2012)
13. Awareness level (%)	1. Yes	19%	46%	64%
	2. No	0%	6%	5%
	3. I don't know	81%	48%	31%

For the assessment of the awareness level indicator, the respondents were asked to answer the following questions:

a. Does the city of Iasi participate in the CIVITAS project, which is partially funded by the European Union?

b. Has the city of Iasi restricted, as part of the CIVITAS project, vehicles' speed and weight in the city's historic centre?

Both the table above, C2.3.1, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

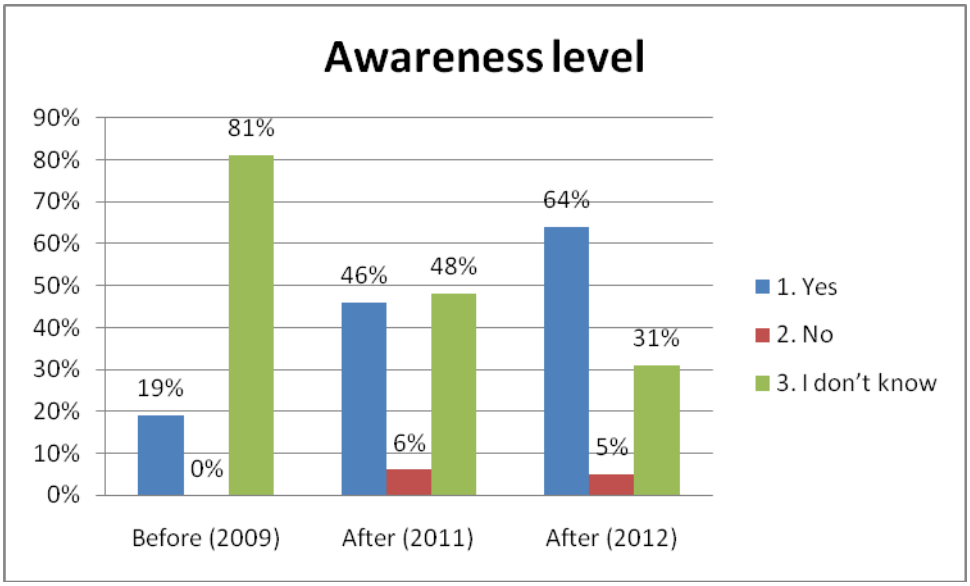


Fig. 11 Awareness level

The awareness level obtained through questionnaires revealed that the percentage of the respondents who had heard about the measure increased to 46% in 2011 and to 64% in 2012 compared to 19% of the interviewees who had known about it before the implementation.

Table C2.3.2 Acceptance level - how unattractive is the historical centre of the city

Indicator		Before (2009)				After (2011)				After (2012)			
14. Acceptance level (%)	question	a	b	c	Av.	a	b	c		a	b	c	Av.
	1. total agreement	55%	56%	35%	49%	48%	56%	62%	56%	40%	30%	30%	33%
	2.	24%	17%	40%	27%	22%	23%	14%	20%	20%	19%	18%	19%
	3.	18%	18%	18%	18%	21%	9%	16%	15%	28%	34%	39%	34%

	4.	3%	4%	4%	4%	3%	5%	5%	4%	4%	8%	8%	7%
	5. total disagreement	0%	5%	3%	2%	6%	7%	3%	5%	8%	9%	5%	7%

Regarding the unattractiveness of the historical centre, people were asked if they agreed with the following questions (on a scale from 1 to 5):

a. Are there currently too many vehicles moving in historical centre?
b. Is the historical centre a dangerous place for pedestrians and cyclists?
c. Has the historical centre a high level of noise pollution?

Both the table above, C2.3.2, and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the three questions for each of the five levels of agreement.

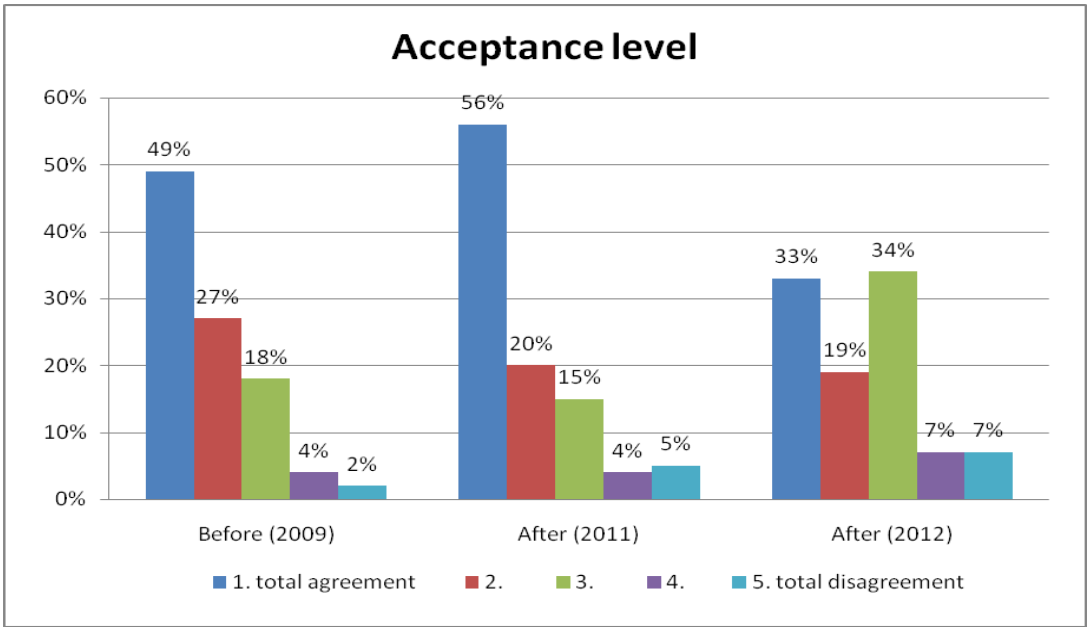


Fig. 12 Acceptance level – how unattractive is the historical centre of the city

Fig. 12 reveals that, in 2009 and 2011, around 76% (points 1 and 2) of the interviewees considered the historical centre an unattractive place, which was dangerous for pedestrians and cyclists, and which had a high level of noise pollution. In 2012 this percentage decreased to 52%.

Table C2.3.3 Acceptance level - restricting the access within the historical centre of the city

Indicator		Before (2009)				After (2011)				After (2012)			
		a	b	c	Av.	a	b	c	Av.	a	b	c	Av.
14. Acceptance level (%)	1. total agreement	37%	57%	64%	53%	84%	60%	66%	70%	86%	72%	69%	76%
	2.	30%	17%	26%	24%	9%	13%	14%	12%	11%	16%	17%	15%
	3.	16%	13%	7%	12%	3%	6%	8%	6%	2%	2%	7%	4%
	4.	7%	5%	1%	4%	3%	4%	5%	4%	1%	3%	4%	3%
	5. total disagreement	10%	8%	2%	7%	1%	17%	7%	8%	0%	7%	3%	3%

Regarding the restriction of the access within the historical centre of the city, the respondents were asked if they agreed with the following questions (on a scale from 1 to 5):

a. Should the access control system be maintained in the historical centre?
b. Should the access in the historical centre be allowed only to pedestrians, cyclists, and non-pollutant means of transport?
c. Would the historical centre of the city be more attractive for tourists if the number of vehicles moving in this area and the level of noise decreased?

Both the table above, C2.3.3, and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the three questions for each of the five levels of agreement.

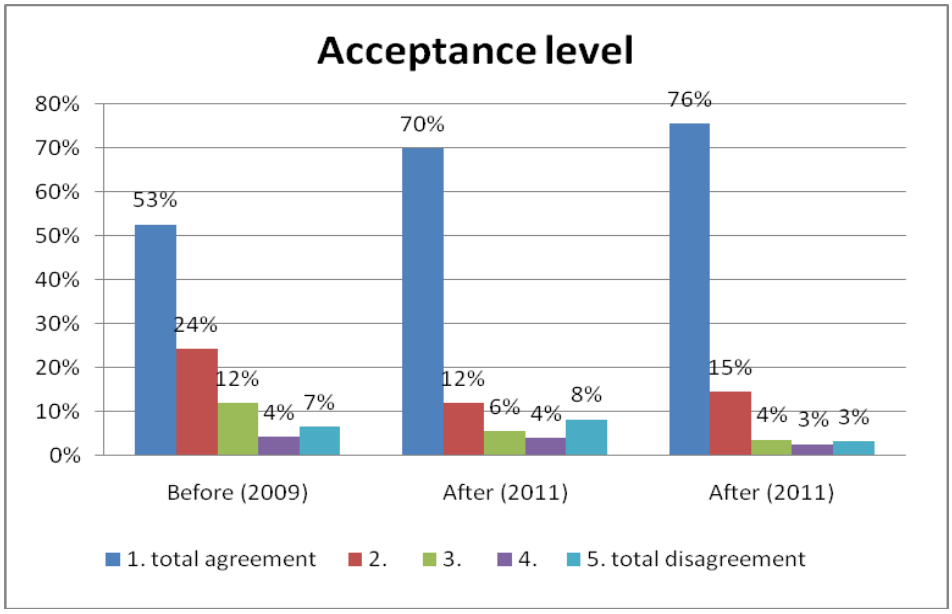


Fig. 13 Acceptance level – restricting the access within the historical centre of the city

On looking at people's opinion regarding access restriction within the historical centre as a result of this measure (Fig. 13), we notice that the level of agreement increased from 77% (points 1 and 2) in 2009 to 82% in 2011 and to 90% in 2012.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	The implementation of an access control scheme in the historic centre of the city	★★
NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%) ★★ = Achieved in full ★★★ = Exceeded		

C4 Upscaling of results

Based on this experience and on similar good practice examples, the city of Iasi has in view the extension of this type of measure to other areas of the city, which will be chosen based on the level of the traffic in several areas of the city. The future urban development of the pedestrian area (Fig. 14) is included in the project of the Municipality of Iasi, *The Development of the Road Network in the Cultural, Historical and Touristic Area"*, which is co-financed by the *Regio* European programme. The impacts of this measure on local vehicle flows and the environmental impacts will be evaluated according to the measure evaluation plan.

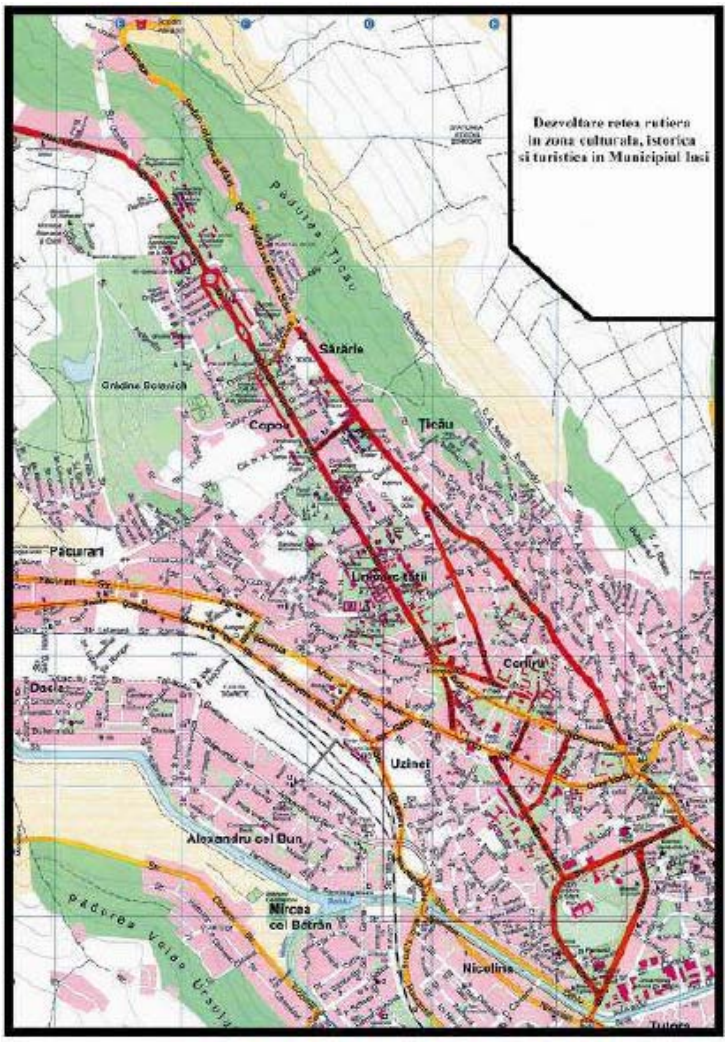


Fig. 14 The map of the project co-financed by the *Regio* European programme

C5 Appraisal of evaluation approach

There were no major problems with the evaluation of this measure. The indicators have been determined according to the methodology set for this measure.
Surveys have been focussed in only one point, but in the centre of the area and close to Post Office venue, where the change is more evident.

C6 Summary of evaluation results

The results obtained after evaluating the measure's indicators are positive.

The levels of CO decreased after the implementation phase, both during daytime and during the night by 5.6% and 6%, respectively, in 2011, and by 7.7% and 8.4%, respectively, in 2012, compared to the values recorded in 2009.

The NO_2 level had the same descending trend: it decreased by 6% and 5.4%, respectively, in 2011 and by over 7.5% and 9.5%, respectively in 2012 compared to 2009, both during daytime and during night time.

The values measured before and after the implementation phase for the noise perception indicator decreased during daytime and during night time by over 4.7% and 3.1%, respectively, in 2011, and by over 7.9% and 3.7%, respectively, in 2012 compared to the values measured in 2009.

The awareness level shows that the percentage of the interviewees who had heard about the measure increased after the implementation to 46% in 2011 and to 64% in 2012 compared to the percentage before the implementation phase, in 2009, when only 19% of the interviewed persons had heard about it.

The acceptance level indicator reveals that the percentage of the respondents who find the historic centre an unattractive place decreased from 76% in 2009 to 52% in 2012. Most of them also agreed with the access restrictions within this area: 77% in 2009, 82% in 2011, and 90% in 2012.

The restriction of access for vehicles within the historical centre led to the decrease of the number of private cars that crossed this area by over 92% at peak hours in 2012 (an average of 19 private cars were recorder during the counting process) and over 91% off peak hours (28 private cars) compared to 2009, when 250 private cars where recorded during peak hours and 323 off peak hours.

After time intervals for the supply activities of the companies located in historical centre have been set, the number of goods vehicles moving in the area has decreased from an average of 43 recorded in 2009 to an average of 10 in 2011 (reduction by over 76.7%) and of 7 in 2012 (reduction by 83.7%).

C7 Future activities relating to the measure

Iasi will continue to maintain the weight and speed restrictions in the historical centre of the city and will ensure that the time schedules approved for supplying activities are respected.

D Process Evaluation Findings

D0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviations from the original plan

- **Renouncing the "CO_2 emissions" indicator** - We decided to renounce the indicator "CO_2 emissions" because the difficulty to determine these emissions per vkm by type of vehicle. Each personal or supply vehicle has a different value of CO_2 emissions and when vehicles were counted their type was not recorded.

D2 Barriers, drivers and activities

D2.1 Barriers

Preparation phase

- **5. Involvement, communication**: Insufficient involvement or awareness of key stakeholders related to the importance of the measure.

Implementation phase

- **12. Other**: Part of the drivers did not respect the restrictions, which affected negatively the results of the measure.

Operation phase

- Despite fines, some drivers still break restrictions.

D2.2 Drivers

Preparation phase

- No drivers

Implementation phase

- **8. Organizational**: Constructive partnership arrangements with stakeholders during the implementation phase, which facilitated the success of the measure.

Operation phase

- **8. Organizational**: Constructive partnership arrangements with stakeholders during the operation phase which improved the results of the measure.

D.2.3 Activities

Preparation phase

- **4. Problem related**: Activities to explain the importance of the problem among key stakeholders and the advantages of implementing the measure.

Implementation phase

- **4. Problem related**: Activities to explain the importance of the problem among key stakeholders and the advantages of implementing the measure.
- **12. Other**: Efforts directed towards increasing the degree of compliance with the restrictions in order to get the expected effects.

Operation phase

- **12. Other**: Efforts directed towards increasing the degree of compliance with the restrictions in order to get the expected effects.

D3 Participation of stakeholders

D3.1 Measure partners

- **Iasi Municipality (Leading role)**
  - in charge with sending formal requests for approval to the City Commission of Traffic, to the Traffic Police and to the Direction of Public Services of Iasi to restrict speed and weight in the historic centre;
  - in charge with organising meetings and negotiations with representatives of the post office to establish other time intervals for distribution activities than within peak hours;
  - in charge with organising meetings with owners of the businesses in the historical centre to establish other time intervals for distribution activities than within peak hours;
  - in charge with implementing the access control scheme in the historic centre;
  - in charge with displaying posters with information on the measure within the historic centre.
- **City Traffic Commission, Traffic Police and the Direction of Public Services of Iasi (Occasional participants)**
  - participated at meetings with the Municipality of Iasi and approved speed and weight restrictions;
  - installed traffic signs.
- **Public Transport Company (Occasional participant)** – keep track of changes in traffic flow.
- **Technical University Iasi (Occasional participant)** – organised surveys within the area in order to demonstrate the impacts of the measure.
- **The company that measured air quality (Occasional participants) – "SC Med Med SRL"** measured air quality level and noise in the historic centre.

D3.2 Stakeholders

- **Inhabitants of Iasi**: the people living in the buildings of the historic centre are positively affected by the weight and speed restrictions;
- **NGOs and condominium associations**: defend the interests of the community;
- **National Association of Students of Administrative Sciences**: organised a study, as part of another project, regarding air and noise pollution within the historic centre. Their conclusion – that the historical centre must be preserved through specific measures – was applied through the ARCHIMEDES project.
- **Iasi**: the image of the city has improved due to the reduction of air and noise pollution within the historic centre.
- **Tourists**: it is safer for them to admire the old part of the city.

D4 Recommendations

D.4.1 Recommendations: measure replication

- **Access control scheme**. The introduction of an access control scheme in the centre of the city contributes to ensuring a safe environment for pedestrians and cyclists and increases the quality of the urban space. We consider that the introduction of some restrictions has a high potential of transferability of this type of measure to other cities.

- **Partnerships**. Creating partnerships with different institutions in other cities may also facilitate the achievements of such a measure.

D.4.2 Recommendations: process (related to barrier-, driver- and action fields)

- **Compliance with restrictions**. As a condition for the success of this measure we mention the efforts necessary in order to increase the degree of compliance with the restrictions imposed on vehicles (personal cars, goods vehicles).
- **Stakeholders' involvement**. In order to make the stakeholders aware of the benefits of this measure and involve them in the process of implementation, its importance must be explained to them.

ANNEX 1

Articles and poster related to the implementation of the measure.

Fig. A1 Poster

Fig. A2 Iasi City Hall website

ANNEX 2

Questionnaire – after implementation

M. 22 – Access control to a historic centre

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.

5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket
   □ set of 10 trips □ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally...)
   _____

7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know

8. Has the city of Iasi restricted, as part of the CIVITAS project, vehicles' speed and weight in the historic centre of the city?
   □ yes □ no □ I don't know

9. To what extent do you agree with the following statements (within a scale from 1 to 5, where 1 has the meaning "total agreement" and 5 "total disagreement")

Are there currently too many vehicles moving in historic centre?	1 2 3 4 5
Is the historic centre a dangerous place for pedestrians and cyclists?	1 2 3 4 5
Has the historic centre has a high level of noise pollution?	1 2 3 4 5
Should the access control system be maintained in the historic centre?	1 2 3 4 5
Should access in the historic centre be allowed only to pedestrians, cyclists and non-pollutant means of transport?	1 2 3 4 5
Would the historic centre of the city be more attractive for tourists if the number of vehicles moving in this area and the level of noise decreased?	1 2 3 4 5

10. Does the idea of transforming the centre of Iasi into an area with little traffic, and, consequently, into a cleaner and more attractive place for tourists seem:
    □ very good □ good □ not bad □ bad □ very bad

Thank you!

Executive summary

In order to promote a sustainable transport within the city, the Municipality of Iasi, together with a specialised marketing company and with representatives of the public transport company, organised meetings at schools, colleges and universities, which were attended by over 1,000 students. They have been educated on the benefits of sustainable transport and encouraged to think about their transport habits. Campaigns were organised to inform people about sustainable transport through several channels: flyers, green maps, TV and radio spots, newspapers, etc.

The evaluation process was based on a survey conducted before and after the implementation of the measure in order to determine the indicators set for this measure. The results are as follows:

- the percentage of people aware of the benefits of sustainable transport increased after the campaigns to 50% in 2012 compared to 2009, when the percentage was 26%.
- several aspects were evaluated based on the acceptance level indicator.
    - the agreement level of the interviewees regarding the negative effect that traffic congestion has on the environment increased from 68% in 2009 to 77% in 2011, and 88% in 2012;
    - in 2012, 77% of the interviewees agreed that using public means of transport instead of personal cars helped create a cleaner and less polluted city, compared to only 47% in 2009;
    - 42% of the respondents answered in 2012 that bicycles would be an alternative to other modes of transport if the bicycle lanes were extended. In 2009 only 18% of them were open to this mode of transport.
- the value of the indicator measuring passengers' perception of the accessibility of public transport in Iasi increased from 25% in 2009 to 47% in 2012.

The following lessons were learned from the implementation of the measure:

- It is very important that the campaigns for promoting alternative modes of transport to private cars are organised by a specialised marketing company, with a planned and robust communication process.
- The success of the measure also depends on the people selected to lead the meetings with students. They should both have experience in communication activities, as well as deep knowledge of general transport-related issues, as well as of transport-related problems in the city the debates are held in.
- Most of the massive communication and awareness events organised in schools and universities on the one hand, and in public places on the other, took place in "green" days (World Environment Day, World Town Planning day, European Mobility Week) and on the occasion of the Iasi Celebration, when media attention is easy to reach. The effect was thus multiplied among the whole population of Iasi.

These campaigns are the expression of an innovative approach at local level to encouraging the use of environmentally friendly modes of transport. They were organised as a result of the cooperation of the Municipality of Iasi, the public transport company PTI, 8 schools and 4 universities, within the framework of a marketing strategy supported by a variety of communication channels: meetings, the Internet, radio, TV, and newspapers.

IAS 35 - Education and Promotion Programme

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To educate people on the benefits of sustainable transport and encourage them to think about their transport habits

(B) Strategic level:

- To travel in a more sustainable manner and to be aware of the alternatives to private cars.

(C) Measure level:

- To organise promotion campaigns in schools and universities to encourage young people to use environmentally-friendly public means of transportation and to instruct them on their benefits.
- To organise promotion campaigns by distributing promotional materials about environmentally-friendly means of transport and their benefits.

A1.2 Target groups

The major target group is made of students, and the promotion campaigns were focused especially on schools and universities. The distribution of promotional materials on the streets made all inhabitants of Iasi part of the target group.

A2 Description

Education and promotion campaigns for using public transport as an environmentally-friendly form of transport were organised. The promotion campaign held at 8 schools and 4 universities is the most important component of this measure. Over 1,000 students of these schools and universities attended these meetings. The advantages of using public transport were presented and the students were involved in debates on the subject of public transport and soft modes of transport versus private cars.

The promotion campaign was structured around four important periods: World Environment Day (in 1 school and 3 colleges), European Mobility Week (in 4 colleges), World Town Planning Day (in 4 universities). Over 1000 students attended these meetings.

From June to November 2010 promotional materials (Table 1) were distributed in parks and on the main boulevard of the CIVITAS corridor. Thus the campaign has reached students living in two major campuses.

The slogan of the campaign, "We move the future", was broadcast on TV and radio, was advertised in newspapers and on the website www.viitorinmiscare.ro.

This webpage provides information on CIVITAS ARCHIMEDES, about the measures which have been implemented in Iasi, about green events in the city, and other relevant information.

Promotional materials / Events	Flyers	Note books	School timetable	Green maps	Pens	Radio spots	TV spots	Newspaper promotional layout
World Environment Day	50,000	10,000	2,600	20,000	0	0	0	0
European Mobility Week	50,000	1,600	2,400	10,000	1,600	9	3	3
Iasi Celebration	50,000	0	0	10,000	0	9	3	3
World Town Planning Day	50,000	8,700	5,000	10,350	3,400	9	3	3

Table 1 Promotional materials

A total of 200,000 flyers, 20,300 note-books, 10,000 school timetables, 50,350 green maps and 5,000 pens have been distributed, 27 radio spots and 9 TV spots were broadcast, and 9 advertisements were published in newspapers within the promotional campaign.

A detailed description of the promotional materials is provided in Annex 1.

A3 Person in charge for evaluation of this measure

Names of persons	Berneaga Ninel - implementation
	Rodica Stoicescu - evaluation
Name of organization	Iasi, PTI
Direct telephone	+40740253567, +40332404715
e-mail	ninel.berneaga@gmail.com, dir_tehnic@ratp-iasi.ro

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **Targeting specific user groups** – although the campaign was targeted mainly on school and university students, all inhabitants of Iasi were part of the target group, since information was distributed by several media throughout the whole city, with a view to attracting more people towards public transport and soft modes of transport
- **New policy instrument** – the campaigns have supported the Municipality of Iasi in its endeavour to make the city cleaner by attracting more people towards using public or soft modes of transport
- **New organizational arrangements or relationships** – Iasi has made arrangements with schools and universities to organise the campaigns

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

Before the CIVITAS project, school and university students used several modes of transport: public means of transport, private cars, bicycle, walking. Their choice was made out of personal reasons, and these were mainly based on socio-economic factors (e.g. the desire to attract the attention of their colleagues by driving a car or the need to cut expenses by using public transport), and less on the impact their transport habits had on the local community (pollution, busy traffic). This choice was also influenced by the fact that there were no attempts to organise in schools and universities of Iasi campaigns to educate students on the benefits of sustainable transport and to encourage them to travel to schools or universities using public and soft modes of transport as alternatives to their or their parents' cars.

B4 Actual implementation of the measure

Stage 1: First tender procedure (*February 2010*) – the Municipality of Iasi organised a procurement procedure in order to contract a marketing company to organise public transport promotion campaigns. This tender was cancelled in February 2010 because no marketing companies expressed their interest to participate in this procedure.

Stage 2: Second tender procedure (*May 2010*) – the Municipality of Iasi organised a second procurement procedure in order to contract a marketing company to organise public transport promotion campaigns.

Stage 3: Signing the contract (*June 2010*) – a contract was signed with the winning company.

Stage4: Promotional campaigns (*June – November 2010*) – beginning with June 2010, the campaign was structured around four important periods: World Environment Day in June, European Mobility Week in September, Iasi Celebration in October, and World Town Planning Day in November.

World Environment Day
Four meetings were organised with support from specialists in communication and in public transport from the City Hall and from the local public transport company on June 7 and 8, 2010 in the following schools and colleges in order to mark the World Environment Day: "Carmen Sylva" School, the College of Arts "Octav Bancila", the College "Garabet Ibraileanu" and the College of Computer Science "Grigore C. Moisil". For better visibility of the campaign a dedicated bus displaying the

slogan of the campaign, "We move the future", and urging passers-by to use public transport was used in the distribution of promotional materials.

For four days, ten promoters travelled along the CIVITAS corridor on the special bus, and distributed 50,000 flyers, 2,100 note-books, 2,100 school timetables, and 1,150 green maps of the city to people they came across on the route.

A press-conference was held at the City Hall on June 9 to mark the beginning of the promotional campaign (Fig. 1).

Fig.1 Press conference at the City Hall

The marketing company, in cooperation with the Department of Sociology of the ”Al. I. Cuza” University, conducted a survey on 1000 people, which were representative for the target group, The survey took place on the CIVITAS corridor between June 21 and July 2, 2010, and its purpose was to identify how popular the ARCHIMEDES project and the measures which were being implemented were, and from which sources the respondents found out about the project. The target group were school and university students, and all inhabitants of Iasi. 97 of the 1000 respondents answered that they had heard about the project; their sources of information are given in the graphic below (Fig. 2).

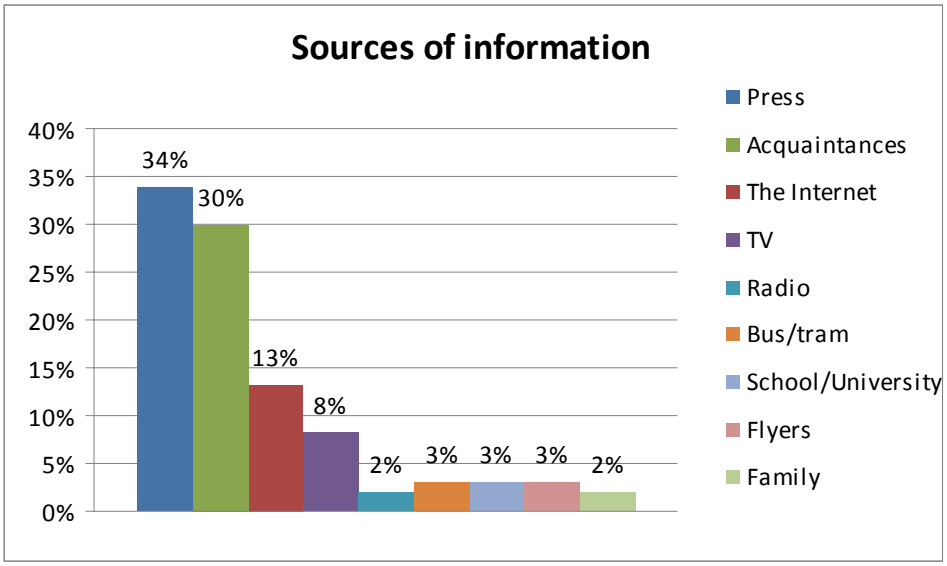


Fig.2. Sources of information

The study of the respondents' sources of information led to the conclusion that the following actions should be continued and extended:

- promotion in the written and online press, and through promotional materials;
- meetings in other education institutions in order to explain students the benefits of using public transport;
- promotion through radio and TV spots, and through a dedicated website.

During the summer of 2010, groups of promoters distributed promotional materials each weekend in 2 public parks and on the Carol I Blvd., reaching students from 2 university campuses. 7,900 notebooks, 18,850 green maps of the city, and 500 school timetables were distributed in two months. The audio spot of the promotional campaign was broadcast each weekend at the open swimming pool within a partnership between the City Hall and a local radio station.

European Mobility Week (16-22 September 2010)

In order to mark the European Mobility Week, four meetings were held in other colleges on the CIVITAS Corridor – the National College ”Mihail Sadoveanu", the Economic and Administrative College, the National College “Mihai Eminescu”, and the National College “Costache Negruzzi” – with support from specialists in communication and public transport from the City Hall and the local public transport company (Fig. 3). The dedicated bus displaying the slogan "We move the future" and urging passers-by to use public transport was used in the distribution of promotional materials of the education and promotion caravan for public transport.

Additional activities were organised, 9 radio spots and 3 TV spots were broadcast and 3 advertisements were published in newspapers at local level. In this phase of the campaign promoting the use of public transport, 50,000 flyers were distributed together with 1,600 note-books, 2,400 school timetables, 10,000 green maps of the city, and 1,600 pens.

Fig.3 Meetings in schools

The Days of Iasi (October 2010)

To mark the Days of Iasi, the same bus displaying the slogan “We move the future” was used for the distribution of promotional materials during 16-18 October (Fig. 4). 9 radio spots and 3 TV spots were broadcast, 3 advertisements were published in newspapers, and 50,000 flyers and 10,000 green maps of the city were distributed.

Fig.4 The promotional bus and promoters in action

World Town Planning Day (November 2010)

To mark the World Town Planning Day, four meetings were organised during 9-11 November 2010 in the following universities located on the CIVITAS corridor: the Technical University "Gheorghe Asachi", the University of Medicine and Pharmacy "Gr. T. Popa", the University "Alexandru Ioan Cuza" and the University of Agricultural Sciences and Veterinary Medicine "Ion Ionescu de la Brad" (Fig. 5). Representatives of the City Hall and of the public transport company presented to 400 students the improvements that CIVITAS ARCHIMEDES was bringing to Iasi and discussed with them the current issues in local public transport. They encouraged the students to use the website www.transportiasi.ro and the online forum of the public transport company, both of which had been created as part of the CIVITAS project (Fig. 6). The same dedicated bus was used for the distribution of promotional materials especially in university campuses.

Additional activities were organised: 9 radio spots and 3 TV spots were broadcast at local level, 3 advertisements were published in newspapers, 50,000 flyers, 8,700 note-books, 5,000 school timetables, 10,350 green maps of the city, and 3,400 pens were distributed.

Fig. 5 Meetings with students and distribution of promotional materials among them

Fig.6 The website www.viitorinmiscare.ro

During the promotional campaign, local and regional media presented news about the achievements of the entire campaign, including information on the CIVITAS-ARCHIMEDES project based on press releases and press conferences of organisers.

The positive reactions of the media related to the events organised are presented in Annex 2.

Stage 5: Data collection for evaluation (*before data collection – November 2009; after data collection – February 2011 and February 2012*) – A survey was conducted on 100 people in order to assess the impact of the measure by evaluating the awareness level, acceptance level and perception of accessibility indicators.

B5 Inter-relationships with other measures

- This measure links several transport-related measures in Iasi (IAS 22 Access to a Historic Centre, IAS 36 - Public Transport User Forum, IAS 37- School Travel Plans in Iasi, IAS 59 - City Cycle Routs)
- This measure is similar to measure UNL 39 – Public transport promotion campaign in Usti nad Labem.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of impact

Through the education and promotion campaign, the Municipality of Iasi presented and explained the benefits of environmentally-friendly forms of transport. These campaigns were designed to have a major impact on different categories of people (mainly the young generation) and were aimed at encouraging them to think about their transport habits. The promotion of sustainable transport included elements of media promotion (audio and video spots), press conferences, distribution of flyers, information brochures, green maps of the city of Iasi, notebooks, engraved pens and presentation catalogues. The promotion campaigns held in schools and universities were the most important component of this measure. The advantages of using public transport were pointed out in order to induce a type of behaviour non-dependent on private cars.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
15		**Accessibility**	Spatial accessibility	Perception of accessibility	Survey	Index (%)
New				Promotional materials	No. of promotional materials	Counting

C1.1.2 Methods for evaluation of indicators

No.	Indicator	Target Value	Source of data and methods	Frequency of Data Collection
13	Awareness level	Increased level of awareness	Surveys were conducted on 100 people three times to assess these indicators. The interviews* were carried out by students in the same public transport stop during five working days. **November 2009.** The respondents were asked if they had heard about the CIVITAS project and if they knew that through this measure environmentally-friendly modes of transport were to be promoted (awareness level). For the assessment of the acceptance indicator we tried to find out their opinion regarding traffic congestion in the city, and if they thought that, if they used public transport, the city would be cleaner, less polluted, etc. The perception of accessibility indicator focused on people's perception about public transport services; they were asked if they were able to reach any point in the city within reasonable time, if the public transport in Iasi were a modern and civilised service, and if it were an alternative to personal cars. **February 2011 and February 2012.** Another set of 100 questionnaires was used for face-to-face interviews in both cases. Students conducted the surveys in the same place as in 2009. The questions for the assessment of the acceptance level and perception of accessibility indicators remained the same. For the evaluation of the awareness level, the respondents were asked if they had heard that this measure promoted environmentally-friendly modes of transport.	Before: November 2009 After: February 2011 and February 2012
14	Acceptance level	Increased level of acceptance		
15	Perception of accessibility	A higher level of "perception of accessibility" measured on a five-point scale		
New	Promotional materials	High number	Materials used in the promotional campaigns (flyers, green maps, presentation catalogues).	June – November, 2010

* The questionnaire is to be found in Annex 3.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	All indicators	M15	Iasi, TUI
Collection of after data	All indicators	M30, M42	Iasi, TUI
D12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 47	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

Before the implementation of this measure there were no programs dedicated to the promotion of the benefits of sustainable transport among school and university students in order to encourage them to think about their transport habits. The promotion campaigns that were focused on topics like promotion of bicycle riding, walking, ways to reduce polluting emissions were dedicated to the general public.

We use the year 2009 as a baseline year to compare the evolution of the indicators below.

For the evaluation process of the Education and promotion programme in Iasi we analysed the awareness level, acceptance level and perception of accessibility indicators, which were obtained through surveys. Therefore we compared the results of the surveys conducted on 100 persons before and after the measure was implemented.

The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The interviews were carried out in the same public transport stop during the two periods the surveys took place after the implementation of the measure. The 100 respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews. The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the two periods differed one from another each year.

We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

C1.3 Methods for Business as Usual scenario

Before the implementation of this measure, there was a gap between general awareness of environmental problems – greenhouse effect, air quality problems, noise – and people's recognition of their contribution to these problems generated by the fact that many of them use personals cars to go to work, to school or to other activities.

C.2 Measure results

C2.2 Society

The interviews conducted to determine the awareness, acceptance and perception of accessibility indicators were carried out by students in the same public transport stop both before, as well as twice after the implementation of the measure. A characterisation of the respondents is provided below (Fig. 7).

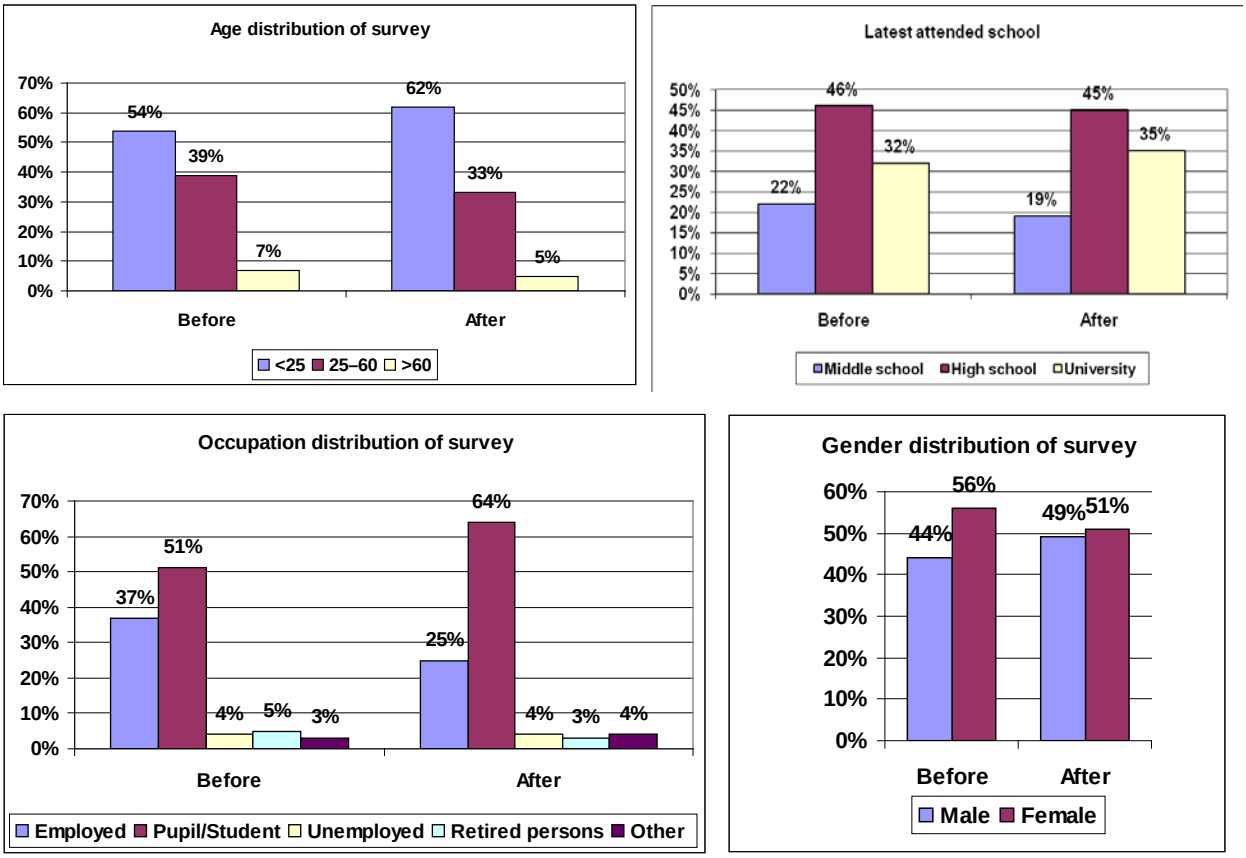


Fig. 7 Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 7), we notice the following evolutions in the "before" and in the "after" situations:

- most of the interviewees are under 25 years of age in both situations (54% and 62%, respectively), and a significant percentage belongs to the 25 to 60 year-old bracket (39% and 33%, respectively);
- most of the interviewees attended only high school (49% and 45%, respectively);
- while in the "before" situation most of the respondents were female (56%), in the "after" situation the number of men and women was much more balanced (49% men and 51% women);
- most of the interviewees are students (51% and 64%, respectively), .

Table C2.2.1: Awareness level

Indicator		Before (2009)	After (2011)	After (2012)
13. Awareness level (%)	1. Yes	26 %	32 %	50 %
	2. No	7 %	8 %	6 %
	3. I don't know	67 %	60 %	44 %

For the assessment of the awareness level the respondents were asked to answer (with Yes, No or I don't know) the following questions (see Annex 3):

- Does the city of Iasi participate in the CIVITAS project, which is partially funded by the European Union?

- Is one of the CIVITAS measures implemented in Iasi meant to promote public transport and green travel modes of transport through campaigns in schools and universities?

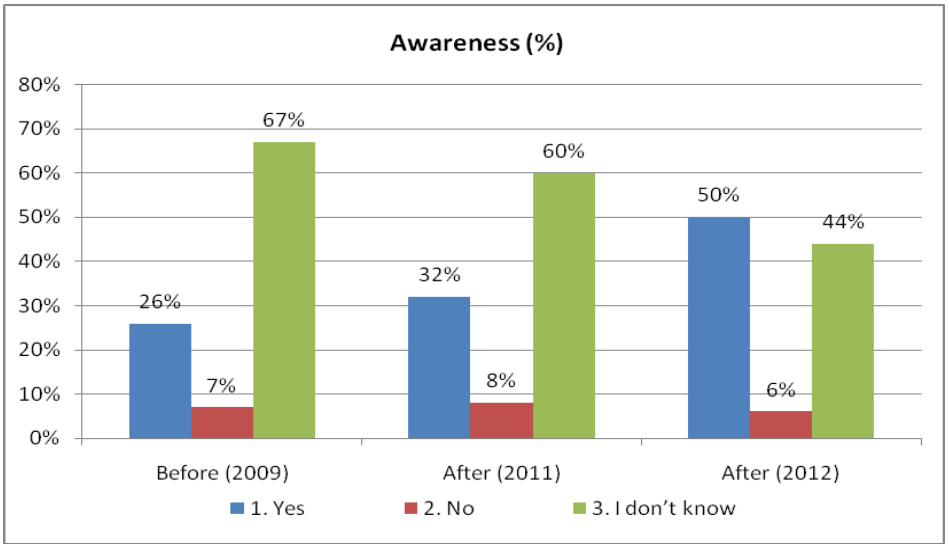


Fig. 8 Awareness level

On analysing the information in Figure 8 we notice that people are now aware of the CIVITAS project and of the benefits of sustainable transport, the percentage of respondents increasing to 50% in 2012 compared to 26% in 2009.

Table C2.2.2: Acceptance level

Indicator		Before (2009)						After (2011)						After (2012)					
		a	b	c	Av.	d	e	a	b	c	Av.	d	e	a	b	c	Av.	d	e
14. Acceptance level (%)	1. total disagreement	10	5	9	8	13	40	9	2	6	6	11	35	7	0	2	3	5	31
	2.	3	6	5	5	10	17	3	2	4	3	5	14	2	1	2	2	3	12
	3.	26	10	23	20	30	23	21	5	17	14	21	13	15	1	8	8	15	15
	4.	25	13	25	21	27	9	20	15	28	21	33	15	24	18	32	25	36	17
	5.total agreement	36	66	38	46	20	11	47	76	45	56	30	23	52	80	56	62	41	25

For the assessment of the acceptance core indicator, the respondents were asked to answer the following questions on a five-point scale (see Annex 3):
a. Is traffic congestion in Iasi a consequence of an increased number of personal cars?
b. Are traffic congestion, noise pollution, green house emissions, and air quality important ecological issues for our city?
c. Do car owners contribute to the aggravation of environmental problems?
d. Would we live in a cleaner and less polluted city if people used public transport vehicles instead of personal cars more often?
e. Is the extension of the bicycle lanes in Iasi an alternative to other modes of transport?

We split this set of questions into three categories: 1. traffic congestion contributes to the aggravation of environmental problems Fig. 9 (Q.:a+b+c); 2. use of public transport helps create a cleaner and less polluted city Fig. 10 (Q. d); 3. use of bicycles for daily trips favoured by proper infrastructure (bicycle lanes) Fig. 11 (Q.e).

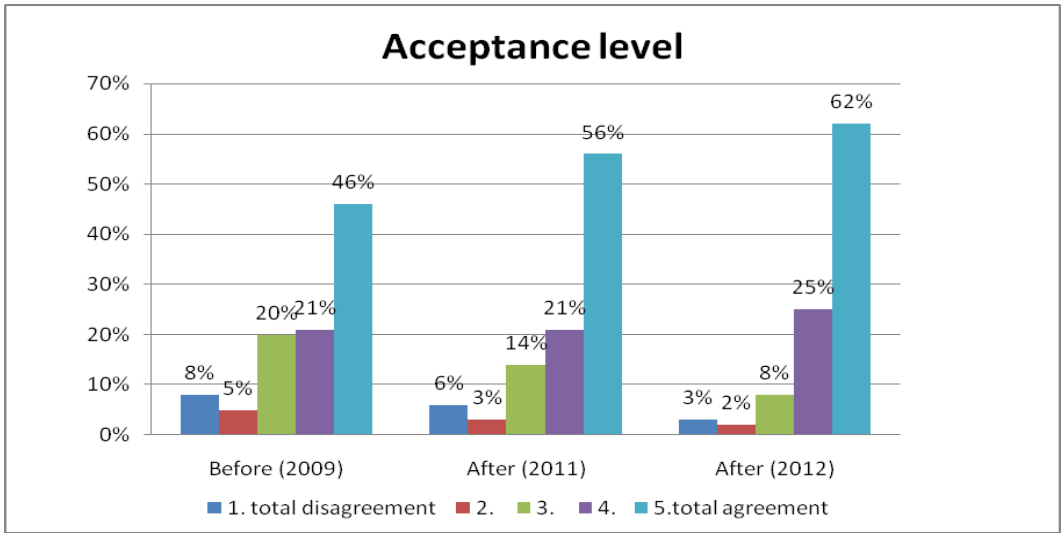


Fig. 9 Acceptance level (%) – traffic congestion contributes to aggravation of environmental problems

Figure 9 shows that, after the educational and promotional campaign were organised, people understood the negative effects of high traffic on the environment – the number of respondents who agreed to this (points 4+5) increased to 77% in 2011 and to 88% in 2012, compared to 68% in 2009.

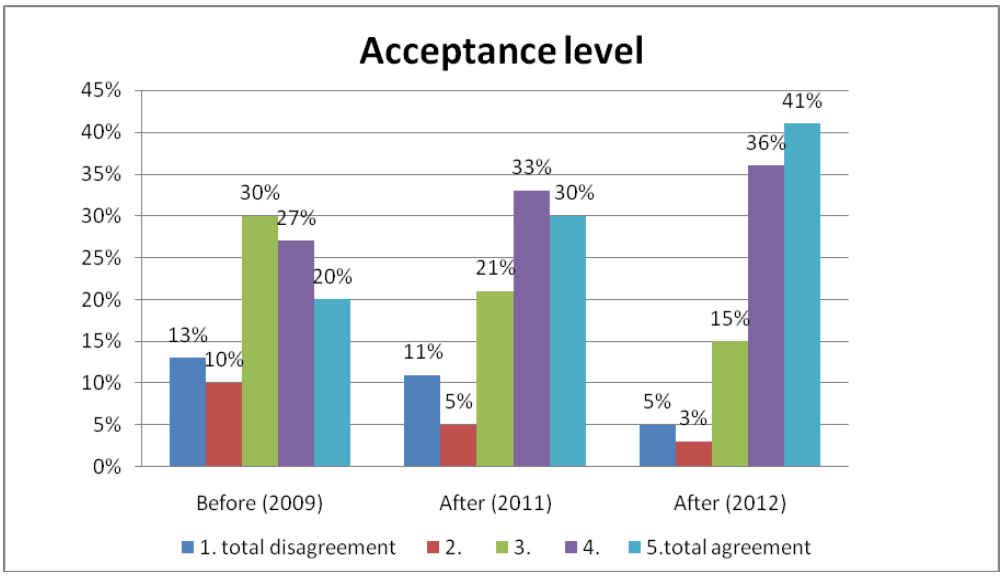


Fig. 10 Acceptance level (%) – use of public transport helps create a cleaner and less polluted city

Within the promotional campaigns people were explained the benefits of using public transport as a daily means of transportation. Their acceptance of the fact that using public transport vehicles helps create a cleaner and less polluted city increased (points 4+5) from 47% in 2009 to 63% in 2011 and 77% in 2012 (Fig. 10).

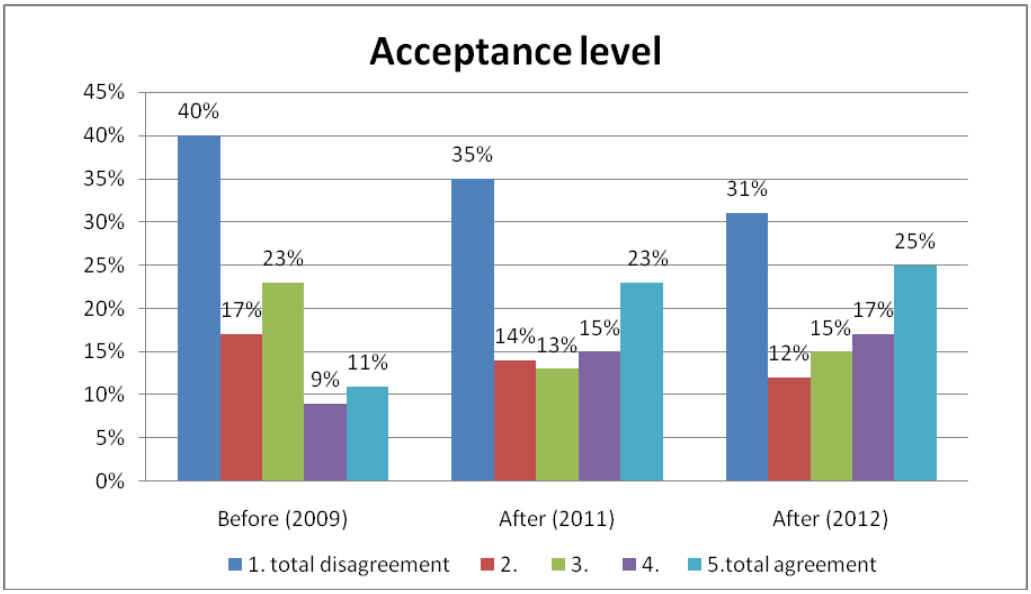


Fig. 11 Acceptance level (%) – use of bicycles for daily trips

The interviewees declared that, if proper bicycle infrastructure were provided, bicycles would represent an alternative to other modes of transport. The percentage of the respondents who agreed to this (points 4+5) increased to 38% in 2011 and to 42% in 2012, compared to 20 % in 2009 (Fig. 11).

Table C2.2.3: Perception of accessibility

Indicator		Before (2009)					After (2011)					After (2012)				
15. Perception of accessibility (%)	1. total disagreement	22	43	9	18	8	14	24	6	14	7	10	26	3	11	4
	2.	21	27	16	12	7	21	18	14	5	4	19	18	6	4	5
	3.	32	18	38	23	22	20	34	28	17	17	17	28	33	10	12
	4.	16	8	26	21	22	25	19	25	23	20	28	22	27	26	23
	5.total agreement	9	4	11	26	41	20	5	27	41	52	26	6	31	49	56

For the evaluation of the perception of accessibility core indicator, the respondents were asked to assess the following statements on a five-point scale (see Annex 3):

a. If I used public means of transport I would be able to reach any point in the city within reasonable time.
b. The public transport company provides a modern and civilised service.
c. Public transport is a viable alternative to personal cars.
d. Public transport pollutes less than personal cars.
e. If people in Iasi used public transport more frequently, the city would be less polluted and less crowded.

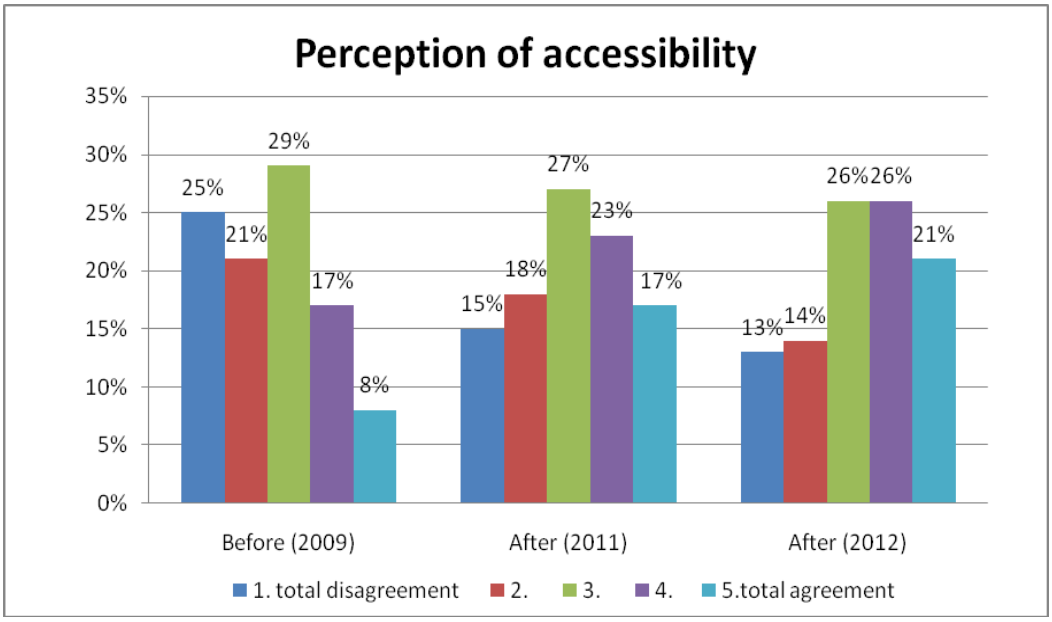


Fig. 12 Perception of accessibility (%)

For the assessment of the perception of accessibility, we considered that only the first 3 questions (a, b and c) were the most important. We calculated the average of the answers to these questions and transposed them into graphical form in Fig. 12. We noticed that the level of the perception of accessibility of the public transport in Iasi (points 4+5) increased from 25% in 2009 to 40% in 2011 and to 47% in 2012.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To organise campaigns in schools and universities for promoting the use of environmentally-friendly public means of transport	★★
2	To organise campaigns for promoting environmentally-friendly means of transport among inhabitants of Iasi by distributing promotional materials	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

C4 Upscaling of results

The promotional program can be upscaled not only in universities and schools, but also at people's workplaces in order to educate them towards using soft modes of transport for a direct positive impact on the environment.

C5 Appraisal of evaluation approach

The evaluation has been focused on the objectives of the measure: the awareness and information on sustainable mobility, with indicators of awareness, accessibility and perception of accessibility.

If this evaluation process were to be resumed, the interviews would probably be conducted on a much larger sample of citizens and in different parts of the city, so that the impact of the measure could be demonstrated at the level of the city.

Since the interviews were carried out only along the CIVITAS corridor, the results reflect only the situation of these particular areas and are influenced only by the persons and conditions there. We cannot extrapolate the results to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample. However, we have studied through the surveys a demonstration area of impact for a possible upscaling at local or metropolitan level.

C6 Summary of evaluation results

After evaluating all indicators we noticed that:

- the percentage of the people aware of the benefits of sustainable transport increased after the promotional campaign to 50% in 2012 compared to 26% in 2009;
- people's acceptance level regarding the negative effects traffic congestion has on the environment increased from 68% in 2009 to 77% in 2011 and to 88% in 2012;
- people accepted that using public means of transport instead of personal cars helps create a cleaner and less polluted city – their percentage increased to 77% in 2012 compared to 47% in 2009;
- the acceptance level indicator that was focused on considering bicycles as an alternative to other modes of transport in case of proper bicycle lane infrastructure showed that the percentage of the respondents open to this means of transportation increased to 42% in 2012 compared to 20% in 2009;
- passengers' perception regarding the accessibility of the public transport in Iasi increased from 25% in 2009 to 47% in 2012.

C7 Future activities relating to the measure

Iasi will continue to maintain the webpage informing people about green events planned in Iasi, and the promotional material used on public transport vehicles will be kept after the CIVITAS project has ended.

D Process Evaluation Findings

D0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviation from the original plan

When the first public tender procedure for this measure started, no marketing company expressed its interest to participate, considering that such a campaign would be a total failure, because part of the tram tracks and of the roads along them was being rehabilitated during that period.

D2 Barriers and drivers

D2.1 Barriers

Preparation phase:

- **2. Institutional:** The first tender was cancelled because no marketing company expressed its interest to participate in this procedure

D2.2 Drivers

Preparation phase:

- **7. Planning:** Information was collected from the target group (1000 school and university students), which contributed to the success of the promotional campaign.

Implementation phase:

- **8. Organizational:** Specialists in communication and in public transport from the Municipality and from the public transport company were involved in the campaign side by side with the specialists of the marketing company.

Operation phase:

- **5. Involvement, communication:** The first reactions of the students who attended the meetings organised for the promotion of environmentally-friendly modes of transport were extremely encouraging: the students participated actively in the debates that followed each presentation, showing great interest in the topics discussed.

D2.3 Activities

Preparation phase:

- **7. Planning:** A survey was conducted on 1000 people, which were representative of the target group, in order to conceive the promotional campaign.

Implementation phase:

- **7. Planning:** The strategy of the campaign was conceived in all details and the promotional materials were created.

Operation phase:

- **3. Cultural:** The promotional campaign was organised during four major cultural events in the city: World Environment Day, European Mobility Week, Days of Iasi, and World Town Planning Day.

- **8. Organizational:** The promotional campaign was organised with support from specialists in communication and public transport from the City Hall and from the local public transport company. For better visibility of the campaign a dedicated bus presenting the slogan of the campaign, "We move the future", and urging "Use the public transport!" was used for the distribution of promotional materials.

D3 Participation

D3.1 Measure partners:

- **Municipality of Iasi (Leading role)**
  - in charge with organising the procurement procedure and with signing the contract with the winning marketing company;
  - in charge with organising a press conference at the City Hall to mark the beginning of the campaign;
  - in charge with for organising meetings with school and university students together with the marketing company and with representatives of the public transport company;
- **Marketing Company (Principle participant)**
  - in charge with the organisation of the campaign, with the elaboration of maps, guides, brochures with the purpose of informing people about the benefits of using environmentally-friendly modes of transport.
  - in charge with conducting the survey on 1000 people.
  - in charge with the distribution of promotional materials during the entire period of the campaign.
- **Public Transport Company (Occasional participant)**
  - provided background information for the promotional campaign on public transport;
  - participated in meetings held in schools, colleges and universities;
  - provided a bus for the distribution of promotional materials and for the promotion of the campaign by displaying its slogan (“We move the future”).
- **Technical University Iasi (Occasional participant)** – responsible for organising interviews on 100 people for the assessment of the awareness level, acceptance level and the perception of accessibility indicators.
- **Department of Sociology of the “Al. I. Cuza” University (Occasional participant)** – cooperated with the marketing company to conduct the survey on 1000 people.

D3.2 Stakeholders:

- **School and university students**: they benefit directly from the promotional campaigns;
- **Other inhabitants of Iasi**: Although the promotional campaigns were focused on school and university students, they reached all the inhabitants of Iasi through promotional materials, news, etc.
- **Other public transport operators**: they benefit indirectly from these campaigns that promote the use of public transport services in general.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Promotion of public transport**: This measure presents a high potential of transferability to other cities, since educating people – especially young people – in the direction of using environmentally-friendly modes of transport has a potential positive impact in any city.

D4.2 Learning from the experiences of the measures

- **Public awareness**: The success of the measure depends essentially on the efforts to consult and make people aware of the importance of the issue of sustainable mobility and of the impacts that the intensive use of public transport has.

- **Speakers' skills.** Experience has shown that although the purpose of the meetings with students is to educate them on the benefits of sustainable transport and to encourage them to think about their transport habits, many questions on the current issues of the transport service in the city arise. Therefore, the representative(s) of the public transport company should not only have deep knowledge of general transport-related issues, but also should know very well the transport-related problems in the city the debates are held in, and have very good communication skills.

Annex 1 - Promotional materials

Fig. A.1 Flyers and notebooks

Fig. A 2 Notebooks, school timetables, and green maps of the city

Annex 2 - Positive articles about Education & Promotion Programme

Evenimentul
REGIONAL AL MOLDOVEI
editia online de sambata, 06 martie 2010
Iaşi, Bacău, Botoşani, Neamţ, Vaslui, Suceava
25 vizitatori pe site

Cuprins
EDITORIAL
MOLDOVA
Iasi
Bacau
Botosani
Neamt
Suceava
Vaslui
POLITICA
ECONOMIE
CULTURA
SPORT
RUBRICI
Suplimente
TRUP&SUFLET
REPORTER
CARTE FILM
DVD
NIMIC IN PLUS

Licitaţie pentru promovarea proiectului Archimedes

Municipalitatea pune la bătaie 645.000 de lei pentru promovarea proiectului Archimedes din cadrul programului Civitas. În cadrul acestui proiect, care beneficiază de finanţare europeană, municipalitatea va crea o serie de facilităţi celor care circulă pe traseul Tudor Vladimirescu – Rond Agronomie, precum sistem de ticketing în 75 de tramvaie, autobuze şi microbuze, piste pentru biciclişti, dar şi un sistem de dirijare a traficului în aşa fel încât mijloacele de transport care trec prin intersecţiile de pe acest traseu să aibă prioritate. Pe 15 aprilie, va avea loc licitaţia în urma căreia se va desemna firma care să se ocupe de publicitatea proiectului. (C.N.)

Fig. A.3 Regional newspaper, “Evenimentul”, March 2010

BUNĂ ZIUA IAŞI

Cotidianul BUNA ZIUA IASI angajeaza corector. Persoanele pot depune CV-urile la sediul redactiei din strada Codr... (intrarea prin Sarariei), prin fax la 0232.216.277 sau l... stiri@bzi.ro

Prima pagina
Actualitate
Concurs BZI
Eveniment
Social
Expres
Economic Local
Stiri Pascani
Stiri din trafic
Economic
National

Chestionar despre transportul in comun

Marti, 06 Iulie 2010

Fig. A.4 Local newspaper, “Buna Ziua Iasi”, July 2010

Fig. A.5 Website of Municipality's newspaper www.curierul-iasi.ro, September 2010

Annex 3
Questionnaire – "after" situation

M. 35 - Educational programs promoting the sustainable transport

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket
   □ set of 10 trips □ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____
7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know
8. Is one of the CIVITAS measures implemented in Iasi meant to promote public transport and green travel modes of transport through campaigns in schools and universities?
   □ yes □ no □ I don't know
9. Please answer the following questions on a 5-point scale (where 1 has the meaning "total disagreement" and 5 "total agreement")

Is traffic congestion in Iasi a consequence of an increased number of personal cars?	1 2 3 4 5
Are traffic congestion, noise pollution, green house emissions, and air quality important ecological issues for our city?	1 2 3 4 5
Do car owners contribute to the aggravation of environmental problems?	1 2 3 4 5
Would we live in a cleaner and less polluted city if people used public transport vehicles instead of personal cars more often?	1 2 3 4 5
Is the extension of the bicycle lanes in Iasi an alternative to other modes of transport?	1 2 3 4 5

10. Do you currently own a personal car (or is there one in your family)?
    □ yes □ no

    In case you do not own a car, imagine that you have one and answer the following questions from this perspective

11. Even if I have my own car, I use public transport to move between home and work.
    □ yes □ no
12. Even if I have my own car, the children in the family use public transport to move between home and school.
    □ yes □ no
13. I prefer to use my car for all my travels and for driving other members of my family to their destinations.
    □ yes □ no

14. In what situation would you be willing to give up the personal car in favour of public transport:
□ never □ if my car broke down □ if the public transport company offered modern transport services
□ if the public transport company provided cheaper tickets □ other situation: _____.

15. To what extent do you agree with the following statements (on a scale from 1 to 5, where 1 has the meaning "total disagreement" and 5 "total agreement")

If I used public means of transport I would be able to reach any point in the city within reasonable time.	1 2 3 4 5
The public transport company provides a modern and civilised service.	1 2 3 4 5
Public transport is a viable alternative to personal cars.	1 2 3 4 5
Public transport pollutes less than personal cars.	1 2 3 4 5
If people in Iasi used public transport more frequently, the city would be less polluted and less crowded.	1 2 3 4 5

Thank you!

Executive summary

Nowadays, a website forum is one of the best ways to find out information, to express opinions and to find out solutions to all sorts of problems. Because this communication channel is so widespread throughout the Internet, the Municipality of Iasi, together with the public transport company, decided to make available to public transport users this modern way of communication. Thus their demands, suggestions, and complaints are received quickly by the transport operator. Some of this information is used to improve the quality of public transport services.

The Municipality of Iasi used radio, TV spots and press releases to inform inhabitants of Iasi about the forum after the measure was implemented.

Several methods were used in the evaluation process to obtain the indicators set for this measure:

- Surveys were carried out to find out people's reaction about the objectives of the measure. The following results were obtained:
  - On evaluating the level of awareness, we noticed an increasing percentage of people who heard about the measure, from 20% in 2011 to 51% in 2012.
  - The acceptance level shows that the percentage of the respondents who use the website forum to communicate with the public transport company increased from 7% in 2011 to 26% in 2012. This significant increase owes partially to the fact that more students were interviewed in 2012 than the year before.
- On analysing the statistical data recorded within the administrative section of the forum, we obtained some satisfying monthly averages of forum's accesses: they increased by 27% in 2011 (5687) and by 10% in 2012 (6235) compared to 2010 (4490). Although the monthly average of the number of pages accessed decreased by 15% in 2011 compared to 2010, and by 17% in 2012 compared to 2011, the average monthly number of accessed pages in the forum is still very high – over 30,000.

The following can be regarded as lessons that have been learnt during the implementation of this measure:

- The creation of a forum is quite complex because the beneficiary has to know exactly what to ask the developer in order to ensure future ease of operation both from the administrative point of view, as well as from the users' perspective.
- The main topics of a forum should ensure diversity, coherence and completeness to the forum, while keeping it concise.

In terms of impact assessment, this measure introduces the concept of forum at the level of public transport in the city, thus creating the possibility of interaction via the Internet between operator and users in order to improve public transport services.

IAS 36 - Public Transport User Forum in Iasi

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To promote high quality, high efficient and more attractive public transport.

(B) Strategic level:

- To keep a permanent relation with passengers.
- To satisfy, as far as possible, the demands of passengers.

(C) Measure level:

- To make a forum for creating a direct link between citizens and the transport company.
- To receive feedbacks from travellers and to use them for improving the quality of transport.

A1.2 Target groups

Since the forum is based on the Internet, the target group consists of the people who use public transport as a daily mode of transport and have Internet access at home, at work or anywhere else. This way of communicating with citizens is complementary to the communication channel established through the toll-free telephone line – IAS 38.

A2 Description

Iasi created a forum on the website of the public transport company as a communication path between passengers and the public transport company. On this forum users can give feedback regarding the public transport services in Iasi, and specialised staff from the public transport company will answer their questions or, when necessary, will submit them to the company's management, whose solutions will be communicated on the forum.

The forum contains four major domains: CIVITAS Plus, Public Transport in Europe, Public Transport in Romania and the forum itself. The forum is administered by specialised personnel from the public transport company, who also act as moderators.

The forum is structured into four categories, whose main purpose is the direct communication with users. These categories (or pages) on the forum provide information on: forum rules; public transport infrastructure in Iasi (vehicles, tram tracks, contact wires, investments in the modernisation of the infrastructure); public transport lines, schedules and ticketing, on the history of the public transport company, as well as a section dedicated to public transport in Romania and in Europe, and to all transport-related subjects that do not fit into the other categories.

The link to the forum is: http://ratp-iasi.ro/forum/bb/.

A3 Person in charge for evaluation of this measure

Names of persons	Nitisor Cristian - implementation
	Carmen Gherca - evaluation
Name of organization	Iasi, PTI
Direct telephone	+40751.700.903, +40332440572
e-mail	c.nitisor@yahoo.com, informatizare@ratp-iasi.ro

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – the opinions and complains of public transport users used to reach the public transport company by post, telephone or e-mail; now passengers have one more way of expressing their problems, suggestions and demands related to public transport. Thus a different type of relationship is created between public transport users and the transport company, based on open dialogue in which any forum user can take part.
- **Use of new technology/ITS** – a web application was developed on the website of the public transport company.

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

Before CIVITAS there was no formal channel for two-way communication and exchange of information between the provider and users of public transport in Iasi. All the demands and complaints about transport services came by post, e-mail or phone, and there was only one e-mail address where people could send complaints. The feedback system was not well organised.

B4 Actual implementation of the measure

Stage 1: Online communication with public transport users – the Municipality of Iasi and the public transport company decided to establish an open communication channel with public transport users by creating a website forum.

Stage 2: Tender documents (August 2009**) – b**ased on the data mentioned in the Description of Work, a procedure for contracting a specialised company for creating the forum was organised.

Stage 3: Contract awarding and planning the work with the contractor (August 2009) – after the contract was awarded, the public transport company and the specialised company discussed the details of the website.

Stage 4: Creation of the website forum (September 2009) – the work for developing the forum was conducted as a collaborative project involving a team of three consultants from the contractor and five specialists from the Municipality of Iasi. Several sessions of analysis were organised, where discussions were held about the design of the forum, about its content, and the results expected from it. The contractor put forward three proposals, one of which was chosen and made public after all the work at the forum was finished (Fig. 1).

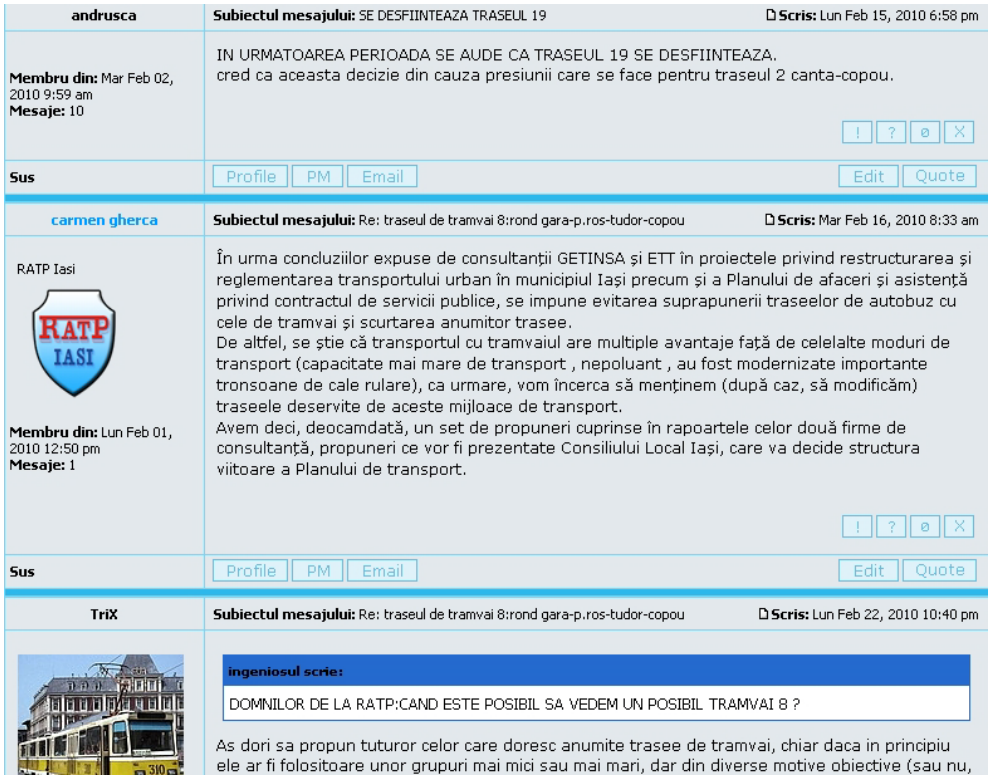
Fig. 1 The main page of the forum

Once the general layout has been drawn and the general requirements were set, a specialist from the Municipality of Iasi and a software developer from the company who won the tender worked together for the implementation of all the details necessary for smooth operation of the forum – both from the point of view of the administrator, as well as from the point of view of users.

The specialist from the Municipality identified the components that had to be developed and those who had to be customised in order to improve the forum platform, and, in parallel with the work of the software developer, he tested everything that the latter implemented.

The site has four main components:

- the forum itself (Fig. 2), i.e. the virtual space where discussions among users take place.
- the informative sections (Fig. 3) dedicated to topics on public transport in Romania and in Europe, and to CIVITAS Plus.
- the administrative panel of the forum (Fig. 4), which enables the administrator to configure the forum in detail and to manage the users.
- the administrative panel of the informative sections (Fig. 5), which enables the administrator to insert text within these sections by means of a WYSIWYG editor and to upload images in the pages he creates with the help of the editor; statistical information and information on the server are also provided in separate sections.



andrusca — **Subiectul mesajului:** SE DESFIINTEAZA TRASEUL 19 — **Scris:** Lun Feb 15, 2010 6:58 pm

Membru din: Mar Feb 02, 2010 9:59 am
Mesaje: 10

IN URMATOAREA PERIOADA SE AUDE CA TRASEUL 19 SE DESFIINTEAZA.
cred ca aceasta decizie din cauza presiunii care se face pentru traseul 2 canta-copou.

Sus | Profile | PM | Email | Edit | Quote

carmen gherca — **Subiectul mesajului:** Re: traseul de tramvai 8:rond gara-p.ros-tudor-copou — **Scris:** Mar Feb 16, 2010 8:33 am

RATP Iasi

Membru din: Lun Feb 01, 2010 12:50 pm
Mesaje: 1

În urma concluziilor expuse de consultanții GETINSA și ETT în proiectele privind restructurarea și reglementarea transportului urban în municipiul Iași precum și a Planului de afaceri și asistență privind contractul de servicii publice, se impune evitarea suprapunerii traseelor de autobuz cu cele de tramvai și scurtarea anumitor trasee.
De altfel, se știe că transportul cu tramvaiul are multiple avantaje față de celelalte moduri de transport (capacitate mai mare de transport , nepoluant , au fost modernizate importante tronsoane de cale rulare), ca urmare, vom încerca să menținem (după caz, să modificăm) traseele deservite de aceste mijloace de transport.
Avem deci, deocamdată, un set de propuneri cuprinse în rapoartele celor două firme de consultanță, propuneri ce vor fi prezentate Consiliului Local Iași, care va decide structura viitoare a Planului de transport.

Sus | Profile | PM | Email | Edit | Quote

TriX — **Subiectul mesajului:** Re: traseul de tramvai 8:rond gara-p.ros-tudor-copou — **Scris:** Lun Feb 22, 2010 10:40 pm

ingeniosul scrie:
DOMNILOR DE LA RATP:CAND ESTE POSIBIL SA VEDEM UN POSIBIL TRAMVAI 8 ?

As dori sa propun tuturor celor care doresc anumite trasee de tramvai, chiar daca in principiu ele ar fi folositoare unor grupuri mai mici sau mai mari, dar din diverse motive obiective (sau nu,

Fig. 2 Fragment from a discussion on the forum

• home • contact • harta site

FORUMUL TRANSPORTULUI PUBLIC DIN IASI

FORUM | TRANSPORTUL PUBLIC IN ROMANIA | TRANSPORTUL PUBLIC IN EUROPA | CIVITAS PLUS

• Politici europene

CiViTAS ARCHIMEDES
THE CIVITAS INITIATIVE IS CO-FINANCED BY THE EUROPEAN UNION

AUTENTIFICARE:
Utilizator:
Parola:
LOGIN

ULTIMELE DISCUTII:

12.11.2012 | 23:48
In topicul: **Evenimente**
Vă invităm, până pe data de 2 decembrie 2012, la Galeria de Artă "La Gard" a Casei de Cultură a Municipiului Iași "Mihai Ursachi", la expoziția de fotografie Perpetuum ...

02.10.2012 | 21:55
In topicul: **La ce ora incep sa circule autobuzele?**
Buna seara, s-ar putea afisa undeva, si online, orele la care circula primele autobuze? De exemplu ma intereseaza din T.Vladimirescu la ce ora circula primul autobuz, iar din Tg.Cucu la ce ora ...

TRANSPORTUL PUBLIC IN EUROPA

100 DE ANI DE TRANSPORT ELECTRIC ÎN SALZBURG
12.10.2009

Între 30 septembrie și 10 octombrie s-au sărbătorit în Salzburg (Austria) 100 de ani de transport electric. Manifestările organizate pe parcursul acestor zile au atras, prin varietatea lor, în aceeași măsură adulți și copii și s-au încadrat armonios cu cele care nu se aflau la prima ediție. „Ziua mobilității", dedicată persoanelor în vârstă și celor cu dizabilități, expoziția „100 de ani de transport electric urban", „Dor de orașe atractive" – prezentare orientată spre dezvoltarea orașelor în strânsă legătură cu transportul electric, ziua porților deschise din cadrul societății de transport public au fost parte din program.

Foto: Cristina Albu [1/5]

Atracția principală a reprezentat-o un tramvai de epocă restaurat în cadrul Compartimentului Restaurări

Fig. 3 Fragment of an article from the informative sections

Fig. 4 The administrative panel of the forum

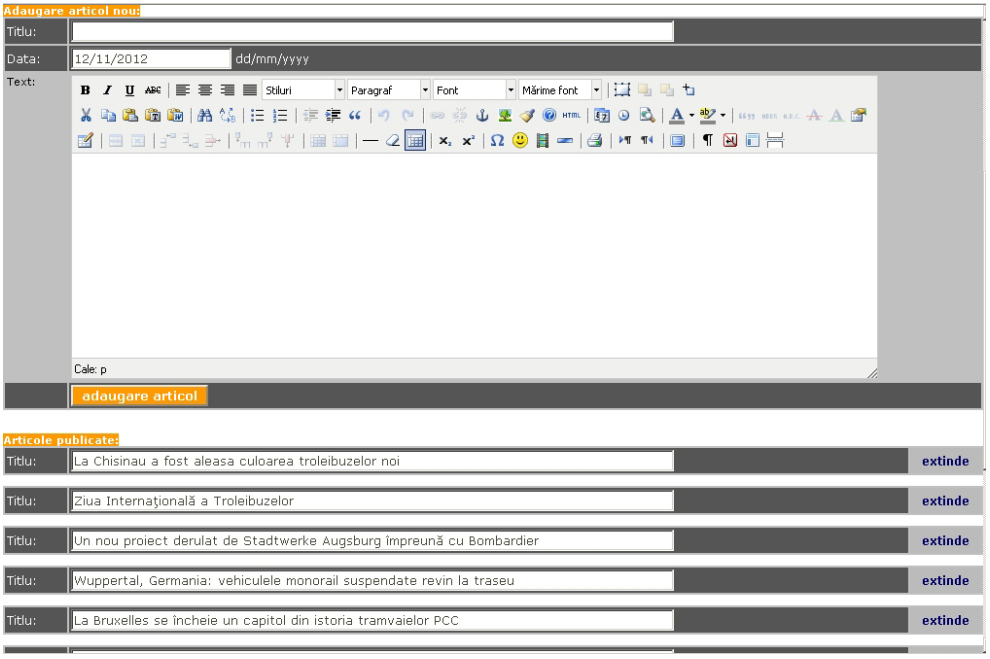


Fig. 5 The administrative panel of the informative sections

Stage 5: Communication activities – After implementation, the local population was informed about the forum by radio, TV and press releases.

Stage 6: Collection of data (starting with November 2009) – the access counter started in November 2009 and will continue as long as the site runs. In order to collect people's opinion regarding the information on public transport obtained through the forum, surveys were carried out twice after the implementation of the measure: in February 2011 and February 2012. A team of students from the Technical University of Iasi conducted face-to-face interviews among passengers and filled in paper-based questionnaires. The answers were used to evaluate the measure.

Stage 7: Monitoring – the forum will be monitored as long as the site runs.

B5 Inter-relationships with other measures

- The measure is linked to Measure IAS 38 – Travel Information Telephone Service, because both measures create direct communication links with citizens, the first via the Internet and the latter by phone.

C Planning of Impact Evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

The measures' impact, which targets the improvement of public transport services, can be evaluated by following the very discussions on the forum. All people that have internet access can initiate discussions with the public transport operator, which can ultimately lead to the improvement of the quality of transport services.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ECONOMY					
2b			**Capital Costs**	**Capital costs**	**costs per equipment**	**euro / equipment**
2			**Operating costs**	**Operating costs**	**costuri specifice de operare**	**euro / year**
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Awareness of the policies/measures	Index (%), qualitative, collected, survey
14			Acceptance	Acceptance level	Attitude survey of current acceptance of the measure	Index (%), qualitative, collected, survey
	NEW			Users	No. of forum accessing	counted

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2b	Capital costs	14.500 Euro	result from the financial offer of the supply company	Once, when the contract is signed
2	Operating costs*	As low as possible	result from the amount per month spent for hosting the forum and the labour costs with the person who supervises the activity on the forum and who answers the questions of the other users	Annually
13	Awareness level	Increased level of awareness	After the implementation of the measure, surveys were conducted to assess these indicators. The interviews** were carried out by students in a public transport stop during five working days both in 2011 and in 2012. 100 persons were interviewed in each of the two years.The interviews* were carried out by students in a public transport stop during five working days. **February 2011 and February 2012.** For the assessment of the awareness level, the respondents were asked if they heard about the CIVITAS project and if they knew that through this measure a website forum was created to offer useful information about public transport services and to collect suggestions and complaints from passengers. For the assessment of the acceptance level indicator, the interviewees were asked if they used the website forum to obtain information on public transport and to transmit suggestions for improving public transport services.	After - February 2011 and February 2012
14	Acceptance level	Increased level of acceptance		
X new	Users	at least 1500 accesses per month	Forum accesses (visits) counter from the first day the forum was made public until the it stops running	Annually

* The “maintenance costs” indicator was replaced with “operating costs”.
** The questionnaire is to be found in Annex 1.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	Not applicable		
Collection of after data	Users	M 15	IASI, PTI
	Users, 13, 14	M 30, M 42	
D 12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

Before the implementation of this measure, the communication between public transport users and the public transport company was always extremely formal and very restrictive; the suggestions and complaints were given an answer, but no further potentially constructive dialogues were held.

The new communication link allows, on the one hand, dialogues in which the initiator and the representative of the transport company take turns in answering or making remarks, and, on the other hand, it allows other users of the forum to step in any discussion whenever they have something to say. The effects can be on the quality of the transport services, if the dialogues lead to any concrete solution or viable idea in this respect, or on the improvement of a hard-to-quantify sense of reliability on the transport operator, which also has implications on the service quality.

Since this a new measure, for the situation before the implementation, the capital and operating costs related to the forum are zero. No surveys were carried out to point out citizens' opinions on the future implementation of this measure.

For the assessment of the measure, the following indicators were collected after its implementation:

- capital costs – the costs for the forum creation – information offered by the Municipality of Iasi.
- operating costs – the amount spent for hosting the forum and for the labour costs of the forum administrator – the data was provided by the transport company;
- number of forum users – the statistics recorded by the website.- awareness level, acceptance level and quality of service – determined through interviews;
- awareness level and acceptance level – determined through interviews;
- number of forum users – the statistics recorded by the website.

The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The interviews were carried out in the same public transport stop during the two periods the surveys took place after the implementation of the measure. The 100 respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews. The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the two periods differed one from another each year.

We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

C 1.3 Methods for Business as Usual scenario

Before this measure was implemented, the communication channels between public transport users and the public transport company were: telephone, fax, e-mail and post. The communication was limited to passengers asking a question or making a complaint and an employee of the company answering them. This did not offer the possibility to conduct more extensive dialogues and debates, to which more people can participate, and which may lead to solutions for the improvement of transport.

C2 Measure results

C2.1 Economy

Table C2.1.1 Capital costs

Indicator	After Euro - without VAT
2b Capital costs	13,922 Euro

Capital costs are the costs needed for the creation of the website forum.

Within the maintenance costs we included the amount per month spent for hosting the forum website.

Table C2.1.2 Operating costs

Indicator	Before (date)	After
2c Operating costs	NA	478 Euro/year

The operating costs are composed of:

- the amount per year spent for hosting the forum website – 372 Euro.
- the labour costs for the employee of the transport company who administers the forum corresponding to the time spent to supervise the activity on the forum and to answer the users' questions.

  The time spent with this activity is one hour per week, the labour costs are 2.04 €/hour, hence the annual value of the operating costs is:
  1 hous / week * 52 weeks/year * 2.04 €/hour = 106 Euro/year.

Total operating costs per year: 478 Euro.

C2.2 Society

In order to determine the level of the awareness and acceptance indicators, interviews were carried out among citizens by students. A characterisation of the respondents is provided in Fig. 6.

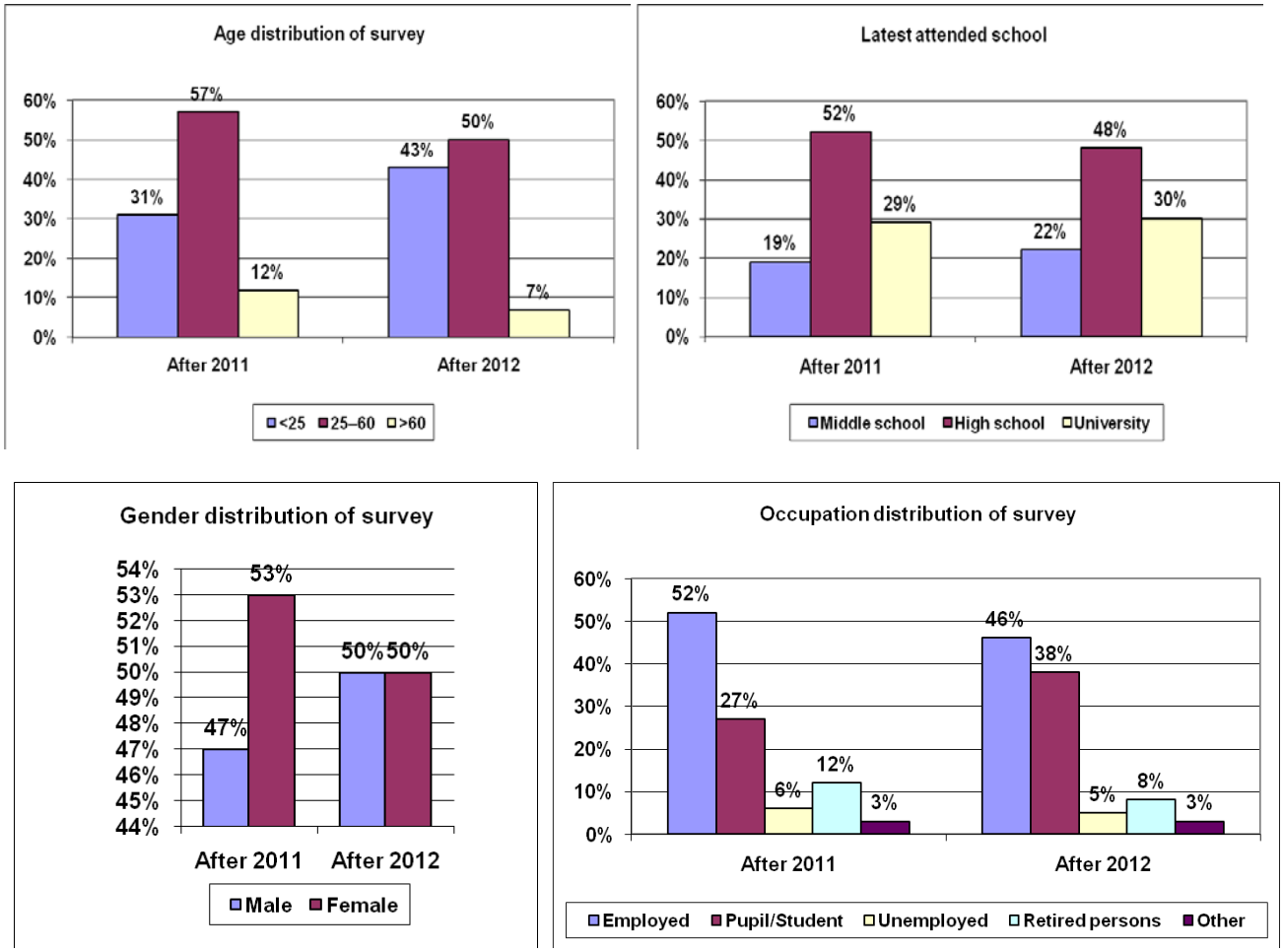


Fig. 6 Characterisation of the respondents

Figure 6 shows that of all the interviewees, 50%-57% are within the 25 to 60 year-old bracket, that most of them are employees, 31%-43% of the respondents are under 25 years of age and most of them are students. On analysing the characteristics of the respondents (Fig. 6), we notice the following evolutions in the two "after" situations:

- in both situations, most of the interviewees are within the 25 to 60 year-old bracket (56% and 50%, respectively). There is also quite a large number of young people under 25 years of age (31 % and 43 %, respectively);
- most of the interviewees attended high school (52% and 48%, respectively);
- while in the first "after" situation most of the interviewees were female (53%), in the second "after" situation the number of male and female respondents was equal.
- most of the interviewees are employed (52% and 46%, respectively), but the percentage of the students who were interviewed increased in 2012 compared to the first situation, from 27% to 38%.

Table C2.2.1 Awareness level

Indicator		Before (date)	After (2011)	After (2012)
13. Awareness level (%)	1. Yes	NA	20%	51%
	2. No	NA	17%	10%
	3. I don't know	NA	63%	39%

The following questions were asked regarding the awareness core indicator (see Annex 1):

a. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
b. Is one of the CIVITAS measures applied in Iasi to create a forum to obtain information or to send suggestions / complaints about the public transport in Iasi?

Both the table above, C2.2.1, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

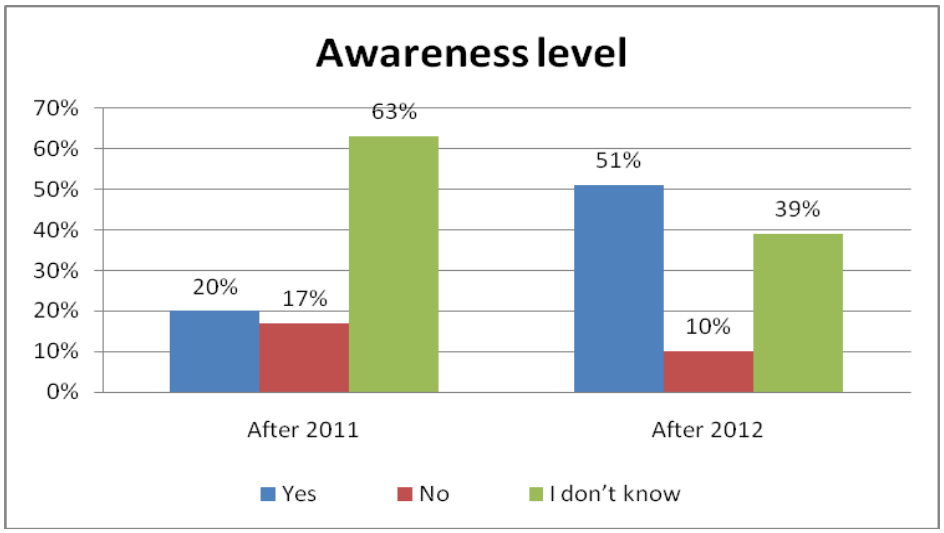


Fig. 7 Awareness level

The surveys carried out showed that people had heard about the project and the measure itself (Fig. 7), with an increase of the number of respondents from 20% in 2011 to 51% in 2012. At the same time, the percentage of the interviewees who had not heard about the measure decreased to 39% in 2012, compared to 63% in 2011.

Table C2.2.2 Acceptance level

Indicator		Before (date)	After (2011)	After (2012)
14. Acceptance level (%)	1. Yes	NA	7%	26%
	2. No	NA	61%	45%
	3. I don't know	NA	32%	29%

For the assessment of the acceptance indicator, respondents were asked the following questions (see Annex 1):

a. Do you use the forum website to get information about the public transport company's services?
b. Do you use the forum to send your suggestions / complaints about the public transport company's services?

Both the table above, C2.2.2, and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

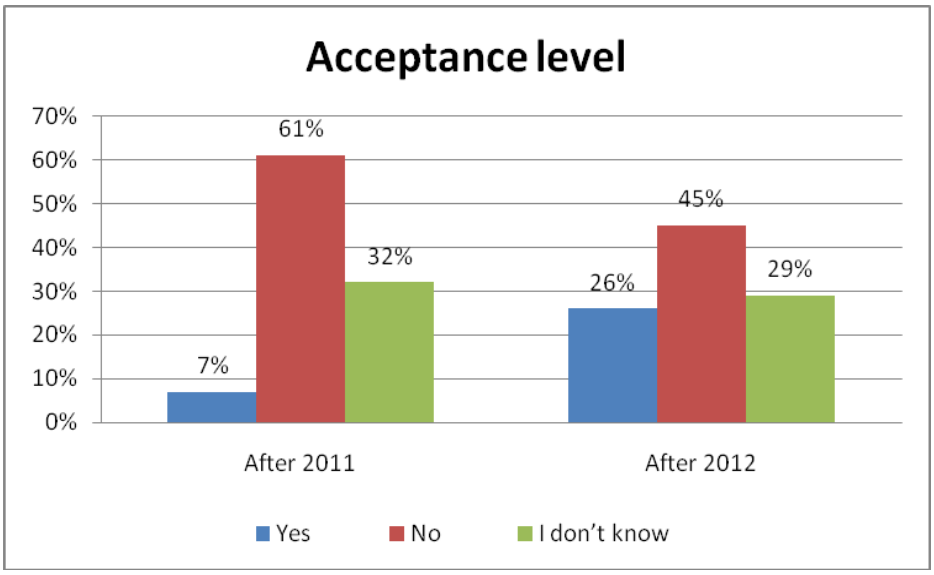


Fig. 8 Acceptance level

On analysing Figure 8, we notice that people use now the forum to communicate with the public transport company; their percentage increased by 19%, from 7% in 2011 to 26% in 2012. A possible reason for this increase is the fact that the number of students interviewed was larger in 2012 compared to 2011.

Table C2.2.3 total number of accesses

Indicator		After
New, No. of accesses (visits)	2010	56,968
	2011	70,101
	January – June, 2012	37,411

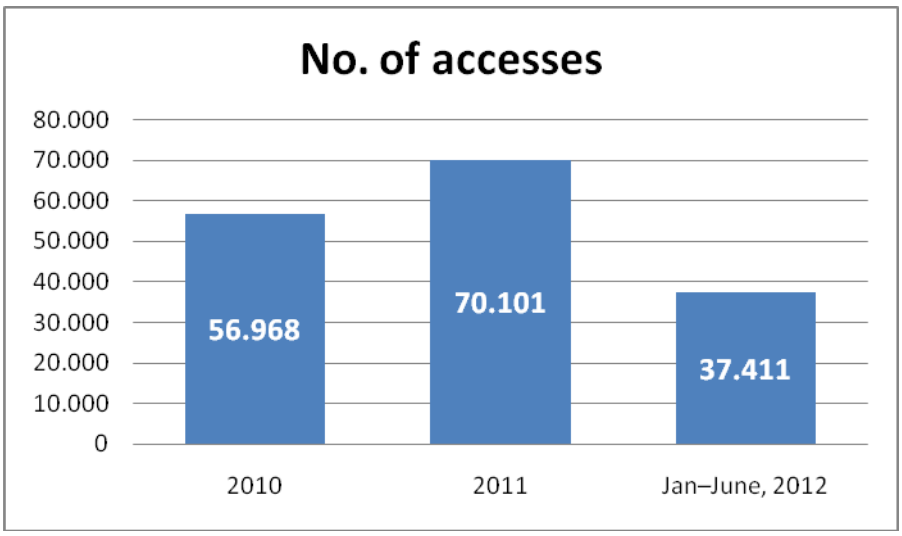


Fig. 9 Number of forum accesses

On counting the number of forum accesses (visits), we noticed that more and more people visit the forum each year: 56,968 in 2010 and 70,101 in 2011 (Fig. 9). If these website visits keep the same ascending trend as during the first 6 months of 2012, at the end of the year the total number will exceed 74,000 accesses.

Table C2.2.4 Monthly average accesses (visits)

We have chosen to calculate the monthly average for the interval January-June because this interval is common to all three years, and therefore the most representative.

Indicator		After
Monthly average accesses	2010	4490
	2011	5687
	2012	6235

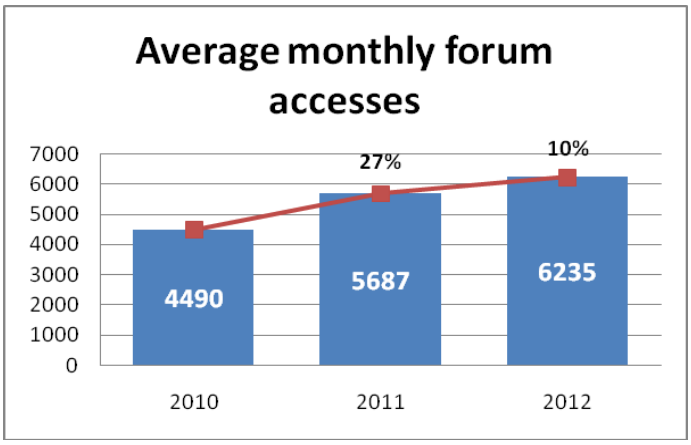
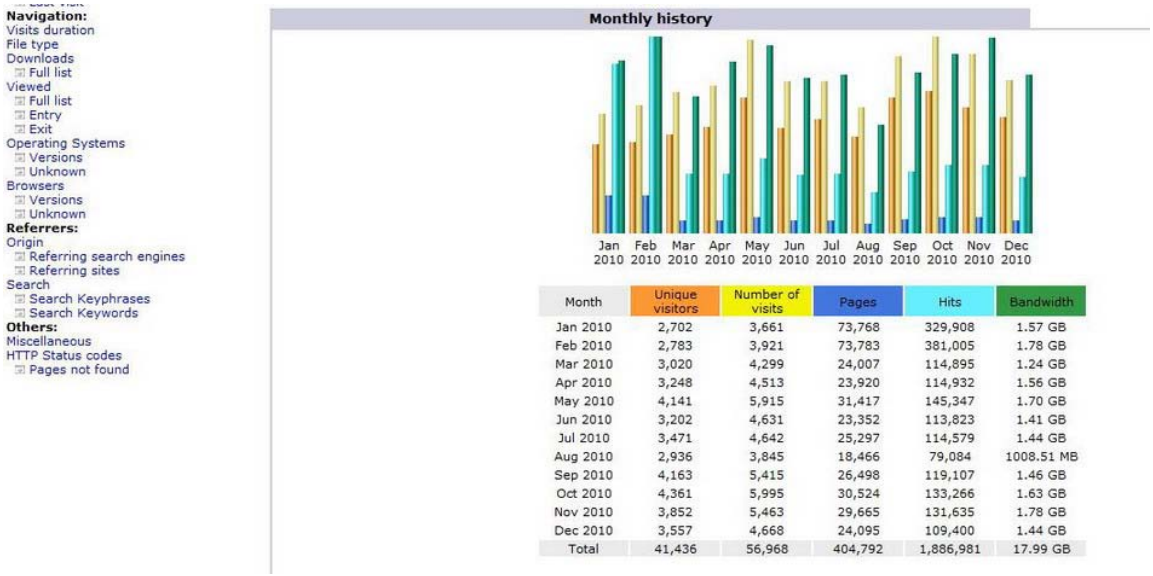


Fig. 10 Average monthly forum accesses (visits)

The monthly average of the website visits within the interval January-June shows an increase by 27% in 2011 and by 10% in 2012 compared to 2010, when a monthly average of 4490 visits was recorded (Fig. 10).

Figures 11-13 present details about the activity on the forum only for the year 2010.



Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2010	2,702	3,661	73,768	329,908	1.57 GB
Feb 2010	2,783	3,921	73,783	381,005	1.78 GB
Mar 2010	3,020	4,299	24,007	114,895	1.24 GB
Apr 2010	3,248	4,513	23,920	114,932	1.56 GB
May 2010	4,141	5,915	31,417	145,347	1.70 GB
Jun 2010	3,202	4,631	23,352	113,823	1.41 GB
Jul 2010	3,471	4,642	25,297	114,579	1.44 GB
Aug 2010	2,936	3,845	18,466	79,084	1008.51 MB
Sep 2010	4,163	5,415	26,498	119,107	1.46 GB
Oct 2010	4,361	5,995	30,524	133,266	1.63 GB
Nov 2010	3,852	5,463	29,665	131,635	1.78 GB
Dec 2010	3,557	4,668	24,095	109,400	1.44 GB
Total	41,436	56,968	404,792	1,886,981	17.99 GB

Fig. 11 The monthly evolution of the forum activity in 2010

Fig. 12 The countries where the forum was accessed from

Fig. 13 The visit durations on the forum

The evolution of the forum within 2010-2012 is obtained out of the forum's statistics.

Table C2.2.5 The monthly average for the period January-June of some indicators of the activity on the forum

Indicators	Year	2010	2011		2012	
Unique visitors		3183	4152	(2010) + 30%	4469	(2011) + 8%
No. of forum's accesses		4490	5687	(2010) + 27%	6235	(2011) + 10%
The number of visited pages within the forum		41708	35369	(2010) - 15%	29381	(2011) - 17%
The visit duration at the level of the whole year	0s-30s	58.4%	61.2%		63.3%	
	30s-2min	15.4%	15.6%		16.6%	
	2min-5min	10.4%	9.9%		9.1%	
	5min-15min	8.4%	7.3%		6.3%	
	15-min-30min	3.2%	2.7%		2.3%	
	30min-1h	2.5%	2.1%		1.8%	
	1h+	1.4%	0.9%		0.4%	

Table C2.2.5 shows that the monthly average of the number of:

- unique visitors increased by 30% in 2011 compared to 3183 unique visitors in 2010, and by 8% in 2012 compared to 4152 in 2011.
- forum accesses increased by 27% in 2011 compared to 4490 accesses in 2010, and by 10% in 2012 compared to 5687 in 2011.
- visited pages of the forum decreased of 15% in 2011 compared to 41,708 pages in 2010, and by 17% in 2012 compared to 35368 in 2011.

The interval 0s-30s and 30s-2min have increased and the rest of the intervals have decreased over the years.

It is hard to estimate the number of people who like or dislike the activity on the forum. We can only say that its purpose, that of creating a communication channel with the users of public transport, has been reached given the large number of messages on the forum – more than 400. The RATP staff managing the forum sent 135 responses to the questions and complaints of the users since the creation of the website. Here are a few examples of discussions:

Q1. “I don't know if what I am writing here matters, but it is very hard for me to tolerate the bad manners of the tram, bus and minibus drivers. [...] It happened to me many times when I asked a tram driver on a route which I hardly ever use if the tram reaches a certain point, to receive the answer "can't you see it is written up there?" or just "look up". What kind of an answer is that? And there are tram and bus drivers who always talk to the phone, stop the vehicles for their relatives and friends to get in, smoke... You aren't probably going to take any measures. And probably my message doesn't even matter. But you should know that my contempt remains.”

A1. “While kindly asking you to avoid generalisations, our response is that all of you who use public means of transport contribute, by each fact you report, to the improvement of the service we provide. However, in order to be able to take concrete action, apart from the instruction sessions for different categories of employees, which are held periodically and, additionally, whenever required, we need data which can help us identify those who do not observe regulations or who need to be admonished with respect to their behaviour. Therefore we ask you, whenever you notice anything that does not seem right, to report it to us in detail using any of the communication channels we have put at your disposal: the free telephone number, which is placed in all public means of transport and on our ticket kiosks, the e-mail address sesizari@ratp-iasi.ro or the forum.

Thank you for your involvement and for having trusted us by the very step you have made, namely to write here despite your feeling that such an endeavour might be pointless.”

Q2. “Here is an idea for the route of tram line 8 after lines 1 and 13 resume their normal route via Podu Ros: Rond Gara – Podu Ros – Tudor Vladimirescu – Copou. Advantages:
- this would be the first line that would link the area of the railway station to Copou
- it would be the only line that would link the Podu de Piatra and Cantemir areas to Tudor Vladimirescu, to the city centre, and to Copou
- it would ensure a direct link between Tudor Vladimirescu and Podu Ros.
Which are the chances for such a route to be approved?”

A2. “Your suggestion will be analysed within the discussions concerning the improvement of our future transport offer.”

Q3. ”A solution for this route to be quicker implemented would be to modify line 13 as follows: Copou – Tg. Cucu – Tatarasi – Metalurgie – Tutora and back, and line 1 or 8 to have the route Copou – Tg. Cucu – Tudor Vladimirescu – Podu Ros – Gara and back. As a consequence, tram line 5 can be shortened to Baza 3, because there not enough passengers further to Tutora.”

A3. “The transport demand on the sector Pod Metalurgie – Tepro – Tutora does not justify the change of the route of line 13 and redirect the trams to Tutora. Tram line 5 satisfies the demand between the areas from the West of the city and the industrial zone in the East (including the area of the Trei Fantani Street). Moreover, larger-capacity trams are required during peak hours.”

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To create a forum as a new and more open communication link between users of public transport and the public transport company in order to attract people to public transport and to improve this service.	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

The forum has proven to have multiple functions. The messages can be roughly broken down into two categories: informative and debating, but they can be further split into other types:

Each subforum (i.e. section of the forum) has at least one descriptive subject, where employees of the transport company in charge of the forum present aspects of the intrinsic activities of the company.

Although the forum was not conceived to serve primarily as a medium for complaints, it has often been used as such. On the one hand this gave the transport company the opportunity to correct wrong perceptions from the exterior by explaining things from a different perspective and by presenting facts that are more difficult to notice as an occasional passenger when not giving enough attention, and on the other hand it served in some instances as an incentive to improve particular aspects of the transport service. Even regular users with more openness to the realities of the public transport in Iasi sometimes answer the less-perceptive users and give them accurate explanations. Debates sometimes arise – at times constructive, at other times less sensible – but they are always supervised by moderators irrespective of whether they interfere with the discussions or not.

Apart from complaints, there are also mere questions of users of public transport, which are answered by employees of the transport company and sometimes even by regular users.

On the whole, the forum offers the transport company a medium for communication with the users of the service it offers, thus giving it an opportunity to better understand the needs of passengers, and to improve its image.

C4 Upscaling of results

Not applicable

C5 Appraisal of evaluation approach

The assessment process followed the evolution of the indicators set for this measure:
- capital and operating costs are values that do not change throughout the period analysed.
- visits of the forum – the interval January-June of each year was analysed because this period is common to the three years, hence it is the most relevant for the study of the evolution of the number of accesses. The information was provided by the public transport company based on the statistics recorded by the forum.
- the awareness level and the acceptance level – surveys were conducted on inhabitants of Iasi.

If this evaluation process were to be resumed, the interviews would probably be conducted on a much larger sample of citizens and in different parts of the city, so that the impact of the measure could be demonstrated at the level of the city.

There were no major problems in assessing this measure; the only aspect that cannot appear in statistics – hence it could not be evaluated – was the number of forum users who are satisfied or not with it.

C6 Summary of evaluation results

The evaluation of the indicators set for this measure revealed the following:

- the percentage of people that heard about the project increased from 20% in 2011 to 51% in 2012.
- the acceptance level showed that the percentage of people using the forum to communicate with the public transport company increased from 7% in 2011 to 26% in 2012.
- the monthly average of website accesses increased by 27% in 2011 (5687) and by 10% in 2012 (6235) since 2010 (4490).
- the monthly average of unique visitors increased by 30% in 2011 compared to 2010, when 3183 visitors were recorded, and by 8% in 2012 compared to 2011 (4152 visitors).
- although the monthly average of the number of visited pages decreased by 15% in 2011 compared to 2010 and by 17% in 2012 compared to 2011, the monthly average of accessed pages is still very high, (over 30,000).

C7 Future activities relating to the measure

The forum will continue to be active after the project ends with a view to improving the quality of public transport services and to make public transport more attractive for all people.

D Process Evaluation Findings

D0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviations from the original plan

There were no deviations from the original plan during the implementation stage.
The "maintenance costs" indicator was replaced with "operating costs" in order to evaluate the measure, because the components of the maintenance costs rather belong to "operating costs".
There were no deviations from the original plan.

D2 Barriers and drivers

D2.1 Barriers

Preparation phase

- **7. Planning**: Deciding on the main topics of a forum (i.e. of the sub-forums) is the starting condition towards its success. The main topics should ensure diversity, coherence and completeness to the forum, while keeping it concise, which means that the ideas of the participants to its creation have to be thoroughly selected.

Implementation phase

- **4. Problem related**: Creating a forum has a greater degree of complexity than just establishing its main topics. The beneficiary has to know exactly what to ask the developer in order to ensure future ease of operation both for users and for administrators.

Operation phase

- **5. Involvement, communication**: Good communication with particular users is sometimes hindered because of their preconceived opinions on some of the aspects of public transport.

D2.2 Drivers

Preparation phase

- **10. Technological**: The degree of development of the Internet medium and its wide accessibility nowadays facilitates the wide spreading of the information about the forum's existence among potential users.

Implementation phase

- **8. Organizational**: The background of the measure persons, as well as their experience in forum administration has successfully conjugated with the professionalism of the developer.

Operation phase

- **3. Cultural**: Having public transport as a hobby has spread all over the world to the extent of becoming a phenomenon. There are a few such users of the forum, both among the measure persons as among regular users, who contribute to its development in the right direction.

D.2.3 Activities

Preparation phase

- **7. Planning**: The measure persons analysed both the users' expectance of what the forum should offer, and the expectance of the public transport company in terms of topics that should be covered.

Implementation phase

- **4. Problem related**: The measure persons collaborated very well with the developer, who followed all their requirements (in terms of user interface – fonts, character sizes and styles, colours, way of displaying images, of visually marking the different states of the topics, and many other such details – and in terms of administration and security – apart from the implicit tools of a forum, other specific requirements were very important to be implemented.

Operation phase

- **5. Involvement, communication**: The measure persons are trying to break the communication barrier with users having preconceived opinions on some of the aspects of public transport by offering explanations, examples, sometimes by going into details, and other times by showing the broader context of the subject in question.

D3 Participation

D3.1. Measure Partners

- **Municipality of Iasi (Leading role)** – responsible for planning and concluding a contract for the development of the web application.
- **Company that created the web application (Principal participant)** – created the forum based on the information received from the public transport company and from the Municipality of Iasi.
- **The public transport company of Iasi (Occasional participant)** – hosts the forum on its website and is responsible for its administration, for moderating the discussions among users and for giving answers to their questions and complaints.
- **Technical University Iasi (Occasional participant)** – organised surveys by face-to-face interviews for the assessment of the measure.

D.3.2 Stakeholders

- **Media** – based on the information on the forum website, the media can sometimes influence the way the public transport company is perceived – either in a positive or in a negative way.
- **Public transport users and non public transport users** – they make remarks and/or complaints regarding public transport services and thus contribute to their improvement.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Applicable at European level**. Forums are widely spread around the world and are used also by institutions to facilitate the beneficiaries of their services the access to information. Since the Internet is accessible to large numbers of people, we think that forums dedicated to public transport can be created by all European transport companies in large cities in order to develop a closer relation to their users and to encourage them to contribute to the improvement of public transport in their city.

D4.2 Recommendations: Learning from the experiences of the measure

- **Complexity**. Creating a forum has a greater degree of complexity than just establishing its main topics. The beneficiary has to know exactly what to ask the developer in order to ensure future ease of operation both for users and for administrators
- **Coherence of the forum**. The main topics of forum should ensure diversity, coherence and completeness to the forum, while keeping it concise.
- **Promptitude in answering.** The answers of the staff of the public transport company to questions and complaints should be as prompt as possible, since feedback on time is vital for the economy of any forum.

ANNEX 1

Questionnaire – after situation

M. 36 – Public transport user forum

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket □ set of 10 trips □ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____
7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know
8. Has the public transport company created, as part of the CIVITAS project, a web forum by means of which people can obtain information or to send suggestions / complaints about the public transport services in Iasi?
   □ yes □ no □ I don't know
9. Which of the following sources of information on public transport in Iasi do you know:
   □ the public transport company's kiosks □ the public transport company's employees
   □ posters in bus stations □ toll-free line
   □ posters in the means of transport □ the website www.ratp-iasi.ro
   □ local newspapers □ website forum
10. Do you use the web forum to get information about the services of the public transport company?
    □ yes □ no □ I don't know
11. Do you use the web forum to send your suggestions / complaints about the services of the public transport company?
    □ yes □ no □ I don't know
12. What measures should be taken by the public transport company of Iasi to improve the web forum?

13. Do you have any suggestions for improving the information system of the public transport company?

Thank you!

Executive summary

In their endeavour to move towards a sustainable transport system, the Municipality of Iasi and the public transport company have been trying to ensure first the conditions that constitute the starting point for attracting more and more people to public transport. The implementation of the CIVITAS project has acted in parallel in the same direction, but at a different level, bringing about innovative measures at city and country level.

Within this measure meetings were organised to inform school and university students about the benefits of sustainable transport systems and to encourage them to reflect to their own transport habits. For a better understanding of students' travel behaviour and of their preferences regarding transport from home to educational institutions, surveys were carried out and three school travel plans were thus created, each for a different category: elementary school, secondary school, high schools and universities.

The evaluation process was based on several core indicators obtained through face-to-face interviews. Paper-based questionnaires were filled in with the answers of the persons interviewed, and the results are as follows:

- The awareness level assessment shows that the percentage of passengers (mainly school and university students) who had heard about school travel plans implemented through ARCHIMEDES increased to 46% in 2012, compared to 37% in 2011.

- The positive impact of the measures contained within the school travel plans and measured through the acceptance level indicator revealed an increased tendency from 63% in 2011 to 72% in 2012.

- The level of perception of accessibility regarding:
  - ✓ reaching the destination by public means of transport within reasonable time increased from 49% in 2011 to 55% in 2012.
  - ✓ the quality of the conditions provided by public means of transport increased from 22% in 2011 to 27% in 2012.
  - ✓ the viability of public means of transport as an alternative to private cars increased from 53% in 2011 to 58% in 2012.
  - ✓ the lower degree of pollution caused by public transport than by private cars increased from 64% in 2011 to 78% in 2012.
  - ✓ the improvement of traffic flow within the city if public transport were more frequently used increased from 71% in 2011 to 79% in 2012.

- The average modal split after the implementation of the measure has progressed as follows:
  - ✓ for the elementary school category, the trips by private car have decreased by 8%, those by tram or bus have increased by 4%, and those by bicycle by 1%.
  - ✓ for the secondary school category, the trips by private car have decreased by 9%, those by tram/bus have increased by 7%, and those by bicycle by 3%.
  - ✓ for the high school and university category, the trips by private care have decreased by 3%, those by tram/bus have increased by 3%, and those by bicycle by 6%.

The following can be regarded as lessons that were learned during the implementation of this measure:

- School and university students should be educated regarding the benefits of sustainable transport in such a manner that they draw the right conclusions by themselves, the external interventions having only a coordinating role.
- Teachers and parents should also attend the meetings with young students, because they should understand the direction their children should be educated towards.
- Experts in environmental issues should also be involved in the meetings with students for accuracy and relevance of information.

The novelty of this measure consists in the fact that environmental issues and benefits of sustainable transport systems within cities were not presented to students through video or radio spots or through newspaper articles, but they were discussed with them. The transport plans that have been implemented are also new for the city of Iasi and represent a way to make students realise that their transport needs can be satisfied by authorities.

IAS 37 - School Travel Plans

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To inform people on the benefits of sustainable transport and to encourage them to think about their transport habits.

(B) Strategic level:

- To educate people to travel in a more sustainable manner and to be aware of the alternatives to private cars.

(C) Measure level:

- To determine school and university students to use public and soft modes of transport through the creation of travel plans.

A1.2 Target groups

- the main target group is represented by school and university students learning at educational institutions along or nearby the CIVITAS corridor;

- children from other schools in the city can be taken as a target group because of the transferability of the measure to other school areas.

- other people can be instructed by promotional materials on the benefits of sustainable transport systems.

A2 Description

The City of Iasi is located in the north-east of Romania and has a total population of 398,000 inhabitants. The city has five universities with approximately 50,000 students and it is the second largest in Romania. The universities and their campuses are located in the central and semi-central area of the city. In the same area there is also a large number of kindergartens, schools and high schools with approximately 10,000 pupils. This creates a large number of routes along the main corridor between Complex Tudor Vladimirescu and Copou with an approximate length of 10 km, called the “CIVITAS corridor” (see Map 1).

A travel plan for school and university students is a document containing a set of measures aimed mainly at decreasing the number of trips made by their own car or by their parents’ car between their home and the educational institution they study at. This was anticipated to:

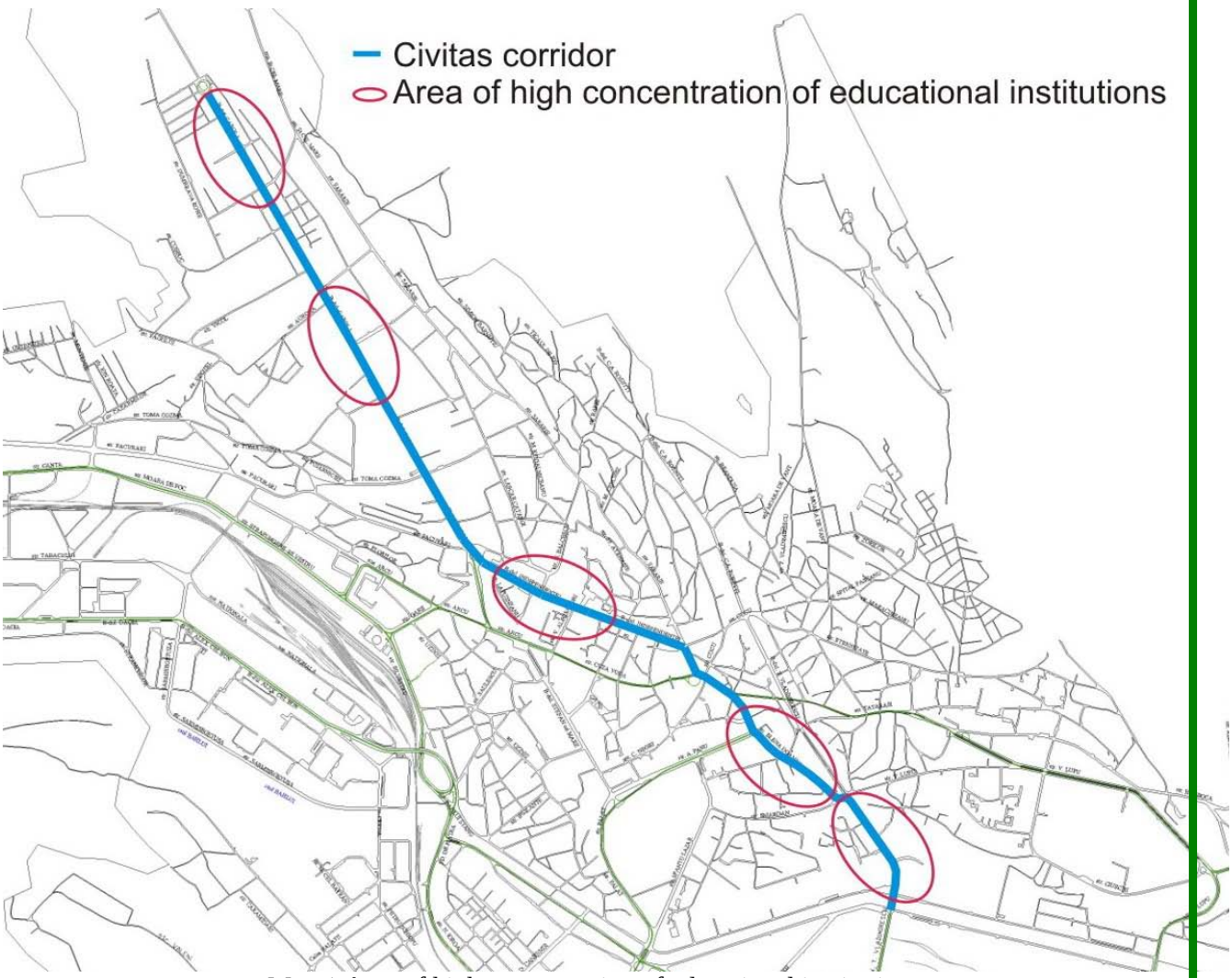
- decrease traffic congestion
- reduce pollution generated by private cars and
- increase students' safety when travelling to and from school or university.

For a better understanding of students’ travel behaviour and of their preferences regarding transport between home and educational institutions, surveys were carried out in eleven schools and four universities placed along the CIVITAS corridor. The surveys were conducted on three categories of students: elementary school pupils (aged 6-11), secondary school students (aged 10-15) and high

school and university students (aged 15-23). Three travel plans were then made on the basis of these surveys.

Iasi City Hall and the public transport company organised together meetings with children, parents, teachers, and university students in order to disseminate the results and suggestions collected for the travel plans, and to discuss the subject of sustainable transport.

Meetings with school children took place within civic education classes at least once a month. Relevant discussions were initiated by teachers and form tutors. For students, such meetings were organised by university teachers every two months.



Map 1 Area of high concentration of educational institutions

A3 Persons in charge with the evaluation of this measure

Names of persons	Homocianu Marius – implementation Dana Cernat – evaluation
Name of organization	Iasi, PTI
Direct telephone	+40742.539.009, +40744546706
e-mail	mariushomocianu421@hotmail.com, s_tehnic@yahoo.com

Measure title:	**School Travel Plans in Iasi**				
City:	**IASI**	*Project:*	**ARCHIMEDES**	*Measure number:*	**37**

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – No previous attempts had been made to affect the modal choice of school and university students in Iasi before.
- **New policy instrument** – Debates with students were aimed at supporting the Municipality of Iasi in its endeavour to make Iasi a cleaner city by encouraging its inhabitants to use public transport or soft modes of transport
- **New organizational arrangements or relationships** – the Municipality of Iasi has developed relationships with schools and universities where debates were organised.

B2 Research and Technology Development

B3 Situation before CIVITAS

Previously there had been no campaigns or events at schools or universities to explain to young people the advantages of using public transport or soft modes of transport and how shifting to such transport modes can contribute to a cleaner city.

B4 Actual implementation of the measure

Stage 1: Survey on travel behaviour (*March 2010***)** – For a better understanding of students' travel behaviour and of their preferences regarding transport from home to educational institutions, surveys were carried out (see Annex 1).

In order to identify the means of transport students use to travel from home to school/university and back and the means of transport they would prefer if they were to choose between several options, a survey was carried out in March 2010 in eleven schools and four universities located in the proximity of the CIVITAS corridor (Rond Agronomie – Tudor Vladimirescu). Representatives of the City of Iasi and of the public transport company have organised with the help of teachers several meetings with students from these schools. The aims of the future transport plans were presented and discussed within these meetings, and 184 elementary school pupils (aged 6-11), 570 secondary school students (10-15) and 1180 high school and university students (15-23).

The questionnaire (see Annex 1) includes questions on: the distance between home and school, the mode of transport from home to school and back, the mode of transport the respondents would like to use for these trips, the reasons and circumstances that would make them use other type of transport instead of their parents' cars or their own.

We also collected relevant data on the schools where the surveys were carried out, such as location (address) and number of students.

As for the reasons for which the pupils and the students taking part in the survey would give up their parents' car in favour of other means of transport in order to get to school, the respondents indicated the following conditions and reasons:

- If the frequency of the public means of transport were higher, which would make them also less crowded.
- If the quality of public transport were improved in terms of cleanness, safety, and comfort.
- If they had access to special buses for schools.

- If there were bicycle lanes in their way to school and bicycle parking racks in schools.
- If environmentally friendly means of transport were introduced, which would contribute to the reduction of pollution.
- If tickets were cheaper or if public transport were free.
- If bus/tram stops were very close to the schools.
- In order to use healthier modes of transport (walking or riding a bicycle).
- Because alternatives to private cars can be an occasion to socialise with colleagues and friends.
- If the distance between home and school were shorter.

The general problems related to transport as identified by school and university students in Iasi can be summarised as follows:

- high level of traffic congestion during peak hours,
- high level of pollution generated by high traffic volume,
- relatively low level of safety in traffic,
- negative impact on health (due to the low number of people who walk or ride bicycles).
- poor social interaction among pupils/students caused by the transport modes they choose (those who use private cars for travelling to school/university do not have the chance to interact with their colleagues on their way to the classes).

The main recommendations are:

- to reduce traffic,
- to encourage pupils/students to go on foot, ride the bicycle or use public transport on their way to school/university and back,
- to reduce the number of accidents and
- to improve the general level of health and fitness of all young people.

A second survey was performed in March 2011 within the same schools and universities as before the implementation of the measure and on the same number of respondents. A comparative analysis of the students' travel behaviour before and after implementation is provided in section C2 – Measure results.

Stage 2: Travel plans (*April 2010*) – Based on the results of the survey, travel plans were developed for school and university students, varying with the group they belonged to.

Based on the discussions with students, on the results of the analysis of the survey from March 2010, on the problems identified and on the recommendations mentioned above, three travel plans were created, one for each age category.

For **primary school pupils** (aged between 6 and 11), the main feature is the need to ensure safety of trips to school and back, hence the increased dependence of children on their parents. The measures suggested for this category of pupils require installation of new signs and road markings (e.g. zebra crossings, lighted signals), creation of pedestrian areas, information of parents, teachers and pupils on the benefits that might be brought by the use of alternative modes of transport like "car sharing", advertising alternative means of transport in school magazines and journals, more school buses as viable alternative to their parents' car, etc. The measures proposed were implemented in the first place to increase the level of safety for this category of children, and also to respond to their desire to travel to school with their colleagues.

For **older pupils** as well as for **university students**, their increased degree of independence and higher awareness require measures appropriate to these characteristics. The following measures have been identified in order to deal with their needs and requirements: creating bicycle lanes and bicycle parking places in schools / universities, increasing the number of buses and trams in order to ensure a higher frequency, introducing high-quality public means of transport, providing special facilities for

pupils/students, improving the information on public transport by setting up information points in bus stops, organizing a campaign to promote public means of transport, making a communication forum on the Internet between passengers and the public company of transport, implementing a hotline for public transport-related information, etc. These measures aimed at reducing traffic congestion and pollution by increasing the use of the public transport and of bicycles, and also at encouraging students to keep fit.

Stage 3: Implementation (*May 2010*) – The travel plans were transmitted to schools and universities.

Meetings with teachers, students and parents were subsequently held in each of the eleven schools and four universities, and participants were informed on the results and suggestions that had resulted from the travel plans.

The meetings with school students were organised by the Municipality of Iasi and by the public transport company and took place within civic education classes at least once a month; relevant discussions were initiated by teachers and form tutors. For university students, such meetings were organised by teachers once every two months.

Moreover, during the public transport education and promotion campaign, since one of its main goals was education in schools, each activity had a special section dedicated to promotion of public transport, which was supported by Iasi City Hall and by the public transport company. Time is the only factor that this measure has in common with the Education Campaign; the public transport education and promotion section is presented at the end of every meeting. Flyers promoting these meetings have been given to interested parties and information posters have been distributed to each school/university investigated (see Fig. 1).

Fig. 1 Examples of posters and flyers

Stage 4: Surveys (*February 2011 and February 2012***) –** In order to determine the values of the awareness level, acceptance level and perception of accessibility indicators, a survey was organised twice after the measure was implemented (see Annex 2).

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure IAS 11 – New school bus link in Iasi** – Romanian students were informed about the new bus line and other routes linked with this line.
- **Measure IAS 35 – Education and promotion programme, and 59 – City cycle routes** – On the occasion of the meetings related to school travel plans, information about the importance of using environmentally-friendly modes of transport and about the bicycle lanes created in Iasi was presented.
- **Measure AAL 30 – Commuter travel plans in Aalborg, MNZ 41 – School travel plans in Monza, DSS 33a School Travel Plans and DSS 83 – Mobility management for university campus in Donostia - San Sebastian –** In Aalborg, Monza and San-Sebastian campaigns were held to promote a cleaner city by using public transport or soft modes of transport.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

Along the CIVITAS corridor there are many schools and universities, therefore the main impact of this measure is on students. If they are encouraged to use public means of transport or soft transport modes they will use less and less frequently personal cars, which will have a direct impact on the environment and on road traffic.

C1.1.1 Selection of indicators

No.	Evaluation Category	Evaluation Sub-Category	Impact	Indicator	Description	Data /Units
	Society					
13		Acceptance	Awareness	Awareness level	survey	Index (%),
14			Acceptance	Acceptance level	survey	Index (%),
15		Accessibility	Spatial Accessibility	Perception of accessibility	survey	Index (%),
	Transport					
29		Transport system	Modal split	Average modal split (trips)	survey	Index (%),

C1.1.2 Methods for evaluation of indicators

No.	Indicator	Target Value	Source of Data and Methods	Frequency Of Data Collection
13	Awareness level	Increased level of awareness	Surveys were conducted on 100 students each time to assess these indicators. The interviews* were carried out by students in a public transport stop during five working days **February 2011 and February 2012.** To assess the awareness level, the respondents were asked if they had heard about the CIVITAS project and that through this measure school travel plans were created for three different categories: elementary school, secondary school, and high school and university students. For the evaluation of the acceptance level indicator, the respondents were asked if the following actions had a positive impact on them: the promotion campaigns to educate students to use soft modes of transport, the increase of the number of public transport vehicles that reach educational institutions, the introduction of special fares for season tickets, etc. Questions were asked for the evaluation of the perception of accessibility indicator, which was focused on students perception about the extent to which public transport services meet their needs (to go anywhere in the city within reasonable time and to travel in modern and civilised conditions), and about the statement that public transport is a viable alternative to personal cars.	February 2011 and February 2012
14	Acceptance level	Increased level of acceptance		
15	Perception of accessibility	A higher level of "accessibility perception" on a five-point scale		
29	Average modal split **	Decrease of the number of students who go by car to and from school or university	A different survey was conducted for the assessment of this indicator. Almost 2000 school and university students were interviewed in order to determine how they get from home to school and back (by private car, bus/tram, bicycle, on foot, in other way). The interviews*** took place within educational institutions and were conducted before and after the implementation of the measure on the same number of students.	Before - March 2010 After - March 2011

* The questionnaire is to be found in Annex 2.
** A new indicator was introduced, average modal split (trips), for the evaluation of the respondents' travel behaviour.
***The questionnaire is to be found in Annex 1.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	13, 14, 15	Not applicable	-
	29	M19	Iasi
Collection of after data	29	M31	Iasi
	13, 14, 15	M30, M42	Iasi, TUI
D12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

Previously there had been no campaigns or events at schools or universities to explain to young people the advantages of using public transport or soft modes of transport and how shifting to such transport modes can contribute to a cleaner city.

Two different surveys were used in the evaluation process of this measure:

- One of the two surveys was conducted in order to evaluate the awareness level, the acceptance level and the perception of accessibility indicators, conducted only after the measure was implemented (in 2011 and in 2012).

  The surveys were conducted on students in a public transport stop in the proximity of schools and university departments. The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses. The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 students), during five days in both periods after the implementation of the measure (2011 and 2012), thus making it possible to compare the results. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews. The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the two periods differed one from another each year.

  We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

- The other survey was conducted for the evaluation of the average modal split indicator, and had 2010 as reference year. Almost 2000 students were interviewed for this purpose in 11 schools and 4 universities. This survey was repeated in 2011 in order to determine the tendency of the target group in terms of travel behaviour.

C1.3 Methods for Business as Usual scenario

The BaU scenario implies that:

- no meetings with students were organised in the 11 schools and 4 universities
- no debates took place with them on sustainable modes of transport and on its benefits
- the circumstances in which the students would choose an environmentally-friendly mode of transport for their daily travels as apposed to personal car were not identified
- the general problems concerning the traffic in the city as perceived by students would not be known

As a consequence of the above, in the BaU scenario no travel plans would have been created.

C2 Measure results

C2.1 Society

The interviews to determine the awareness level, acceptance level and perception of accessibility indicators were carried out by students on 100 school and university students in the same public transport stop twice after the implementation of the measure, A characterisation of the respondents is provided below (Fig. 2).

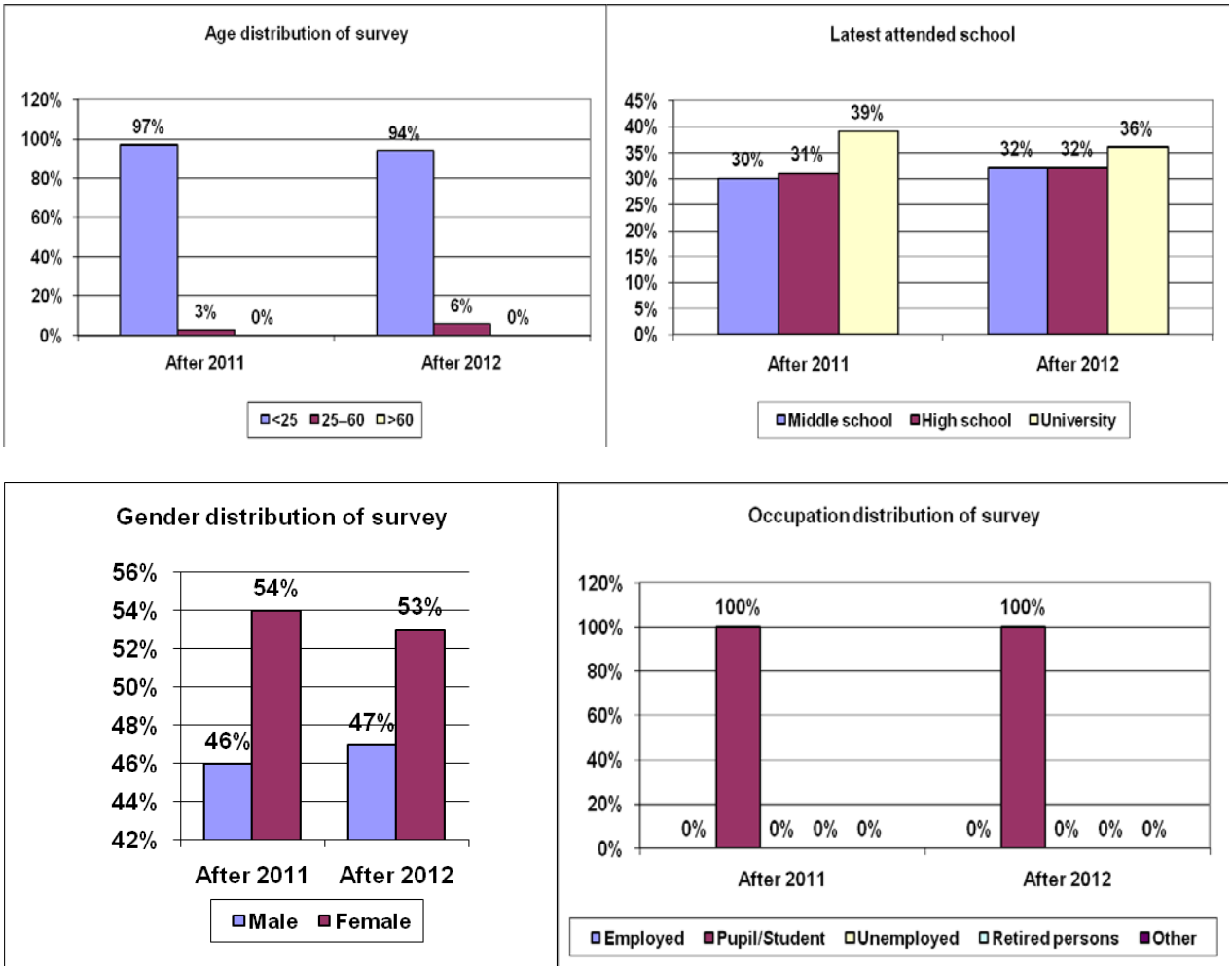


Fig. 2 Characterisation the respondents

On analysing the characteristics of the respondents (Fig. 2), we notice the following evolutions in the two periods:

- Most of the interviewees are under 25 years of age (97% and 94%, respectively).
- Most of them had attended the university (39% and 36%, respectively), and the rest had attended the other two cycles of education in almost equal percentages (over 30% and 32%, respectively).
- Most of the interviewees are female in both cases (54% and 53%, respectively).
- All the interviewees are school and university students (100 %).

Table C2.1.1 Awareness level

Indicator		Before (date)	After (2011)	After (2012)
13. Awareness level (%)	1. Yes	N.A.	37%	46%
	2. No	N.A.	8%	6%
	3. I don't know	N.A.	55%	48%

Regarding the awareness level indicator, the following questions were asked:

a. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
b. Has the public transport company, as a part of the CIVITAS project, implemented transport plans for students aiming at educating students on the benefits of sustainable transport?

Both the table above, C2.1.1, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

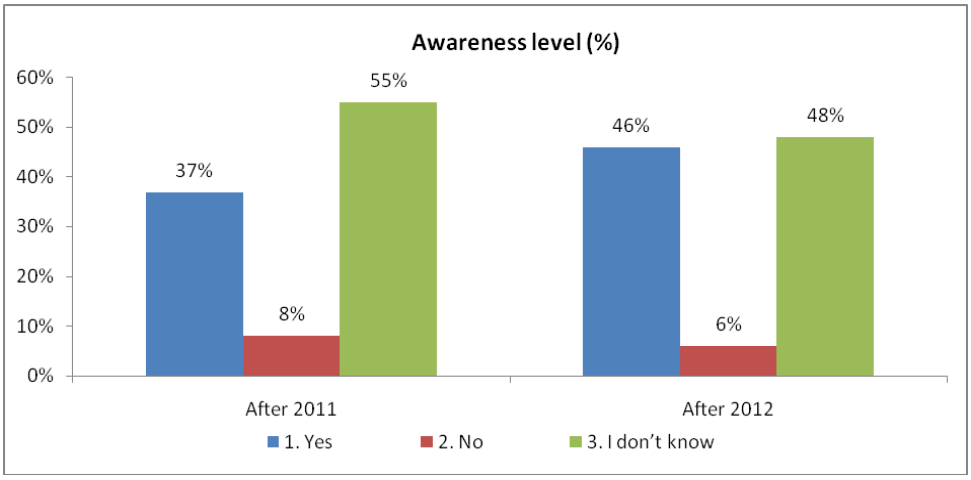


Fig. 3 Awareness level

Figure 3 indicates that the percentage of students knowing about school travel plans implemented through ARCHIMEDES project increased to 46% in 2012 compared to 37% in 2011.

Table C 2.1.2 Acceptance level

Indicator		Before (date)	After (2011)					After (2012)				
			a	b	c	d	Average	a	b	c	d	Average
14. Acceptance level (%)	1. total disagreement	N.A.	6	4	0	4	4%	4	3	1	2	2%
	2.		21	11	4	9	11%	18	8	3	7	9%
	3.		26	24	12	27	22%	23	21	5	19	17%
	4.		21	21	19	22	21%	26	24	22	26	25%
	5. total agreement		26	40	65	38	42%	29	44	69	46	47%

Regarding the acceptance core indicator, students were asked if the following actions have had a positive impact on them regarding their transport habits:
a. The promotion events aimed at educating students to use soft mode of transport for their daily trips.
b. The increase of the number of trams and buses in order to ensure higher frequency of public transport vehicles beginning with the new school year.

c. The introduction of special fares for season tickets
d. The improvement of the methods to inform people about public transport (toll-free telephone line, webpages, etc.)?

Both the table above, C2.1.2, and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the four questions for each of the five levels of agreement.

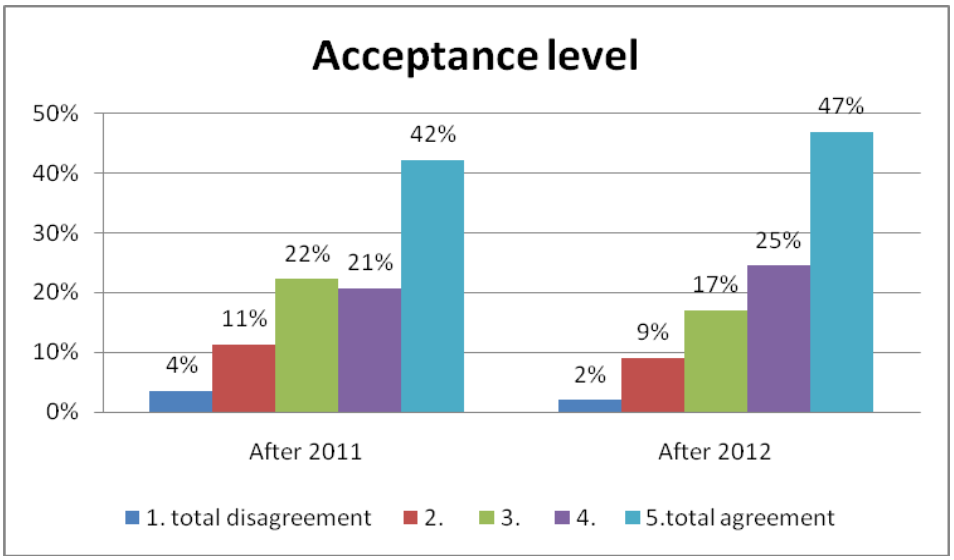


Fig. 4 Acceptance level

Fig. 4 shows an increased percentage of students – from 63% (points 4 and 5) in 2011 to 72% in 2012 – on which actions like promotion campaigns organised in schools and universities, improvement of the frequency of public means of transport that reach educational institutions, introduction of special fares for season tickets have had a positive impact.

Table C 2.1.3 Perception of accessibility

Indicator		Before (date)	After (2011)					After (2012)				
			a	b	c	d	e	a	b	c	d	e
15. Perception of accessibility (%)	1. total agreement	N.A.	22%	6%	27%	39%	48%	26%	8%	30%	48%	52%
	2.		27%	16%	26%	25%	23%	29%	19%	28%	30%	27%
	3.		18%	37%	25%	16%	18%	19%	37%	25%	8%	13%
	4.		20%	18%	15%	9%	5%	16%	16%	12%	8%	4%
	5.total disagreement		13%	23%	7%	11%	6%	10%	20%	5%	6%	4%

Regarding the perception of accessibility indicator, the respondents were asked to assess the following statements on a five-point scale:
a. If I used public means of transport I would be able to reach any point in the city within reasonable time.
b. The public transport company provides a modern and civilised service.
c. Public transport is a viable alternative to personal cars.
d. Public transport pollutes less than personal cars.
e. If people in Iasi used public transport more frequently, the city would be less polluted and less crowded.

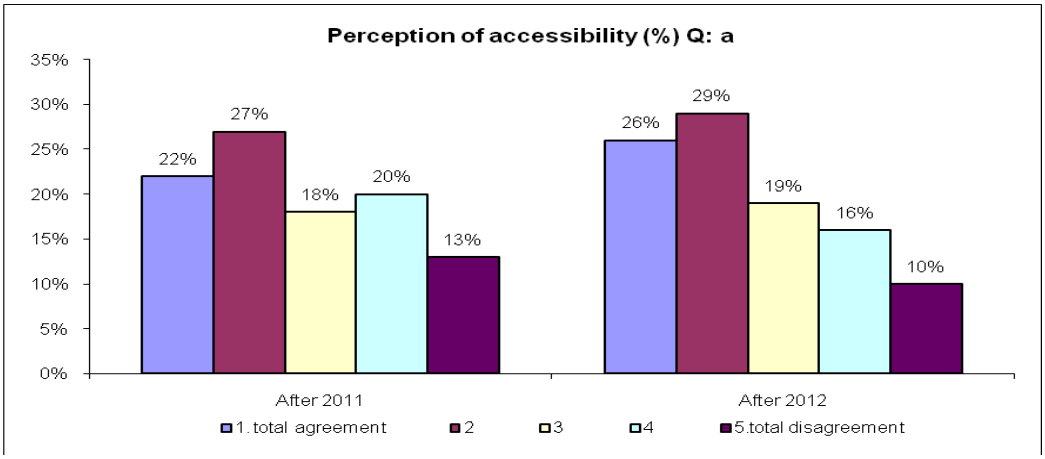


Fig. 5 Perception of accessibility – Q: a

The percent of the interviewees who agreed that they can go by public means of transport anywhere in the city within reasonable time increased from 49% in 2011 (points 1 and 2) to 55% in 2012 (Fig. 5).

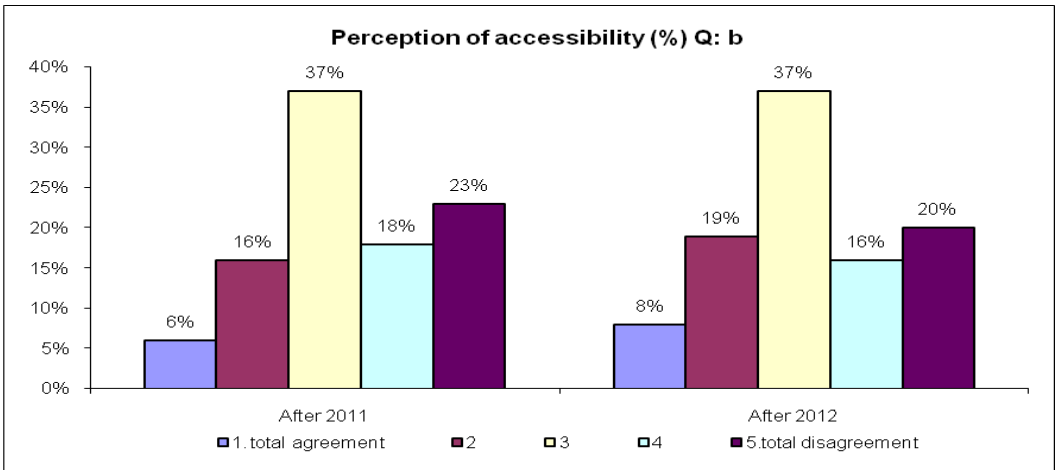


Fig. 6 Perception of accessibility – Q: b

Figure 6 indicates that 27% (points 1 and 2) of the respondents think that the public means of transport offer modern conditions, 5% more than in 2011.

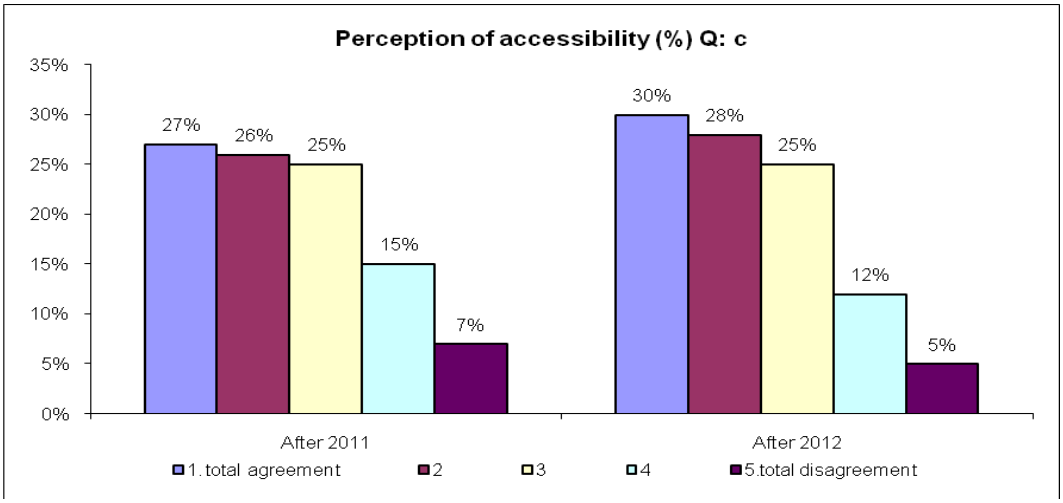


Fig. 7 Perception of accessibility – Q: c

When the respondents were asked if public means of transport vehicles represented a viable alternative to personal cars, 53% in 2011, and 58% in 2012 (points 1 and 2) agreed (Fig. 7).

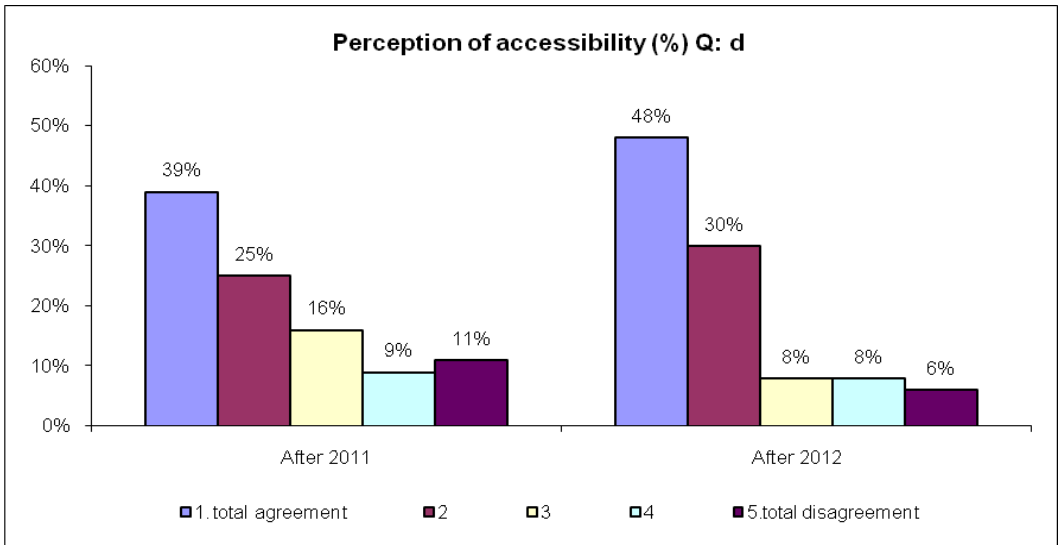


Fig. 8 Perception of accessibility – Q: d

Figure 8 shows that a large percentage of the respondents – 64% in 2011 and 78% in 2012 (points 1 and 2) – agree that public transport vehicles pollute less than personal cars.

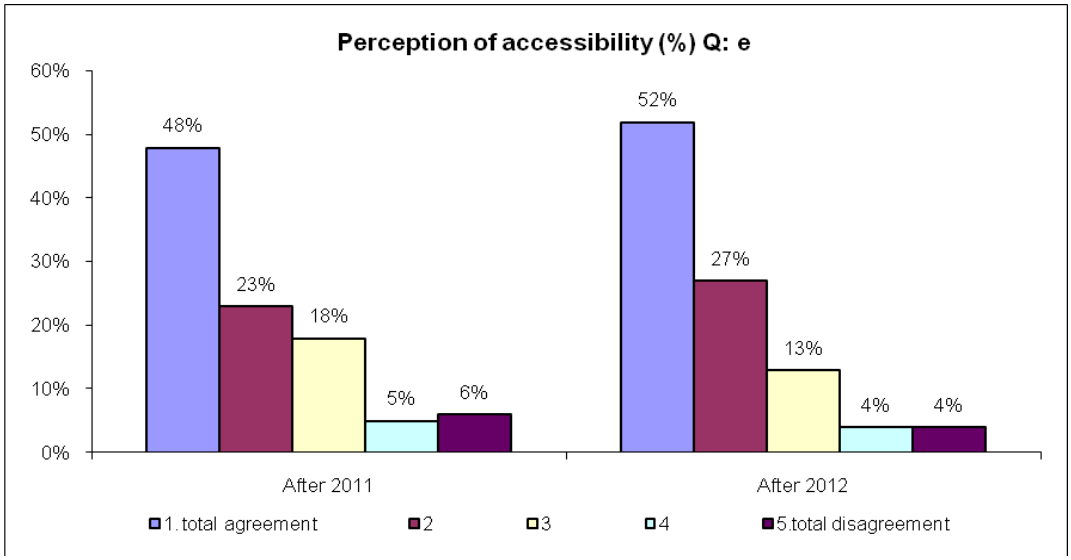


Fig. 9 Perception of accessibility – Q: e

From Fig. 9 we notice that most of the interviewees (points 1 and 2) – 71% in 2011 and 79% in 2012 – think that the city would be less polluted and less crowded if public transport were used more frequently

Table C.2.1.4 Average modal split

For the analysis of the average modal split indicator, almost 2000 students were interviewed in schools and universities with respect to the mode of transport they use for going to school/university and back. They were also asked to name the transport mode they would prefer if they were to choose. The surveys were conducted before and after the implementation of the measure

Table C.2.1.4.1 Average modal split – elementary school

184 pupils aged between 6 and 11 were interviewed.

Elementary school pupils	Home to school		School to home		Favourite mode of transport	
	Before	After	Before	After	Before	After
Personal car	59%	51%	49%	42%	36%	31%
Bus / Tram	15%	19%	19%	22%	1%	5%
School bus	1%	2%	1%	2%	27%	27%
Bicycle	1%	2%	1%	2%	16%	18%
Walking	23%	24%	29%	30%	18%	17%
Other	1%	2%	1%	2%	2%	2%

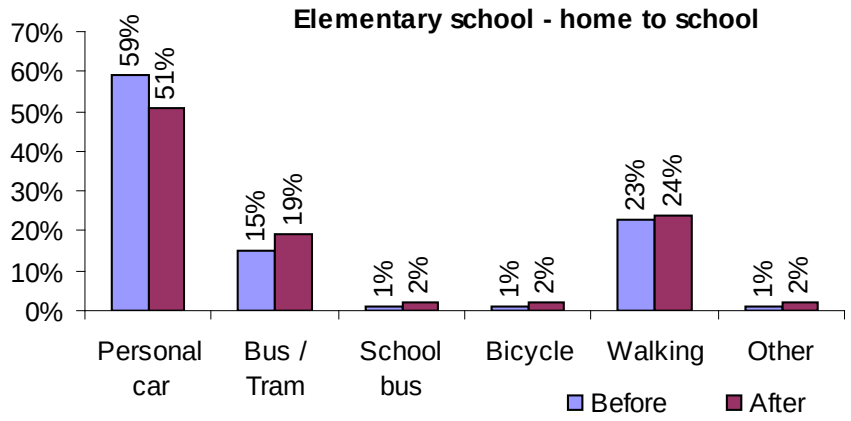


Fig. 10 Mode of transport from home to school

Regarding the mode of transport from home to school, we notice from Figure 10 that, before the implementation of the measure, 59% of the interviewees travelled in their parent's car, which can be explained by their young age (6-11), 15% used public means of transport, 23% walked to school, and other modes of transport were used by 1% of the respondents each. After the implementation of the measure, the trips by private car decreased by 8%, those by public means of transport increased by 4%, and the percentage of the respondents who walked to school, who used the school bus, the bicycle or other means of transport increased by 1% each.

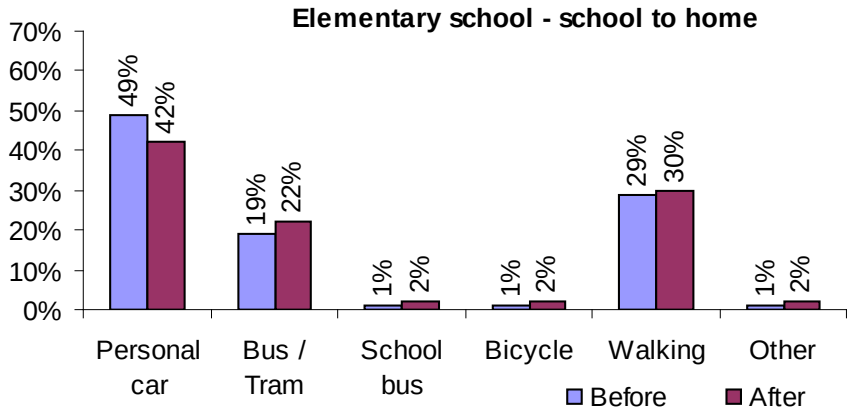


Fig 11. Mode of transport from school to home

Before the implementation of the measure, for moving from school to home (Fig. 11) 49% of the respondents were driven by their parents, 19% used public means of transport, and 29% went on foot. After the measure was implemented, the trips by private cars decreased by 7%, those by public means of transport increased by 3%, and the other modes of transport increased by 1% each.

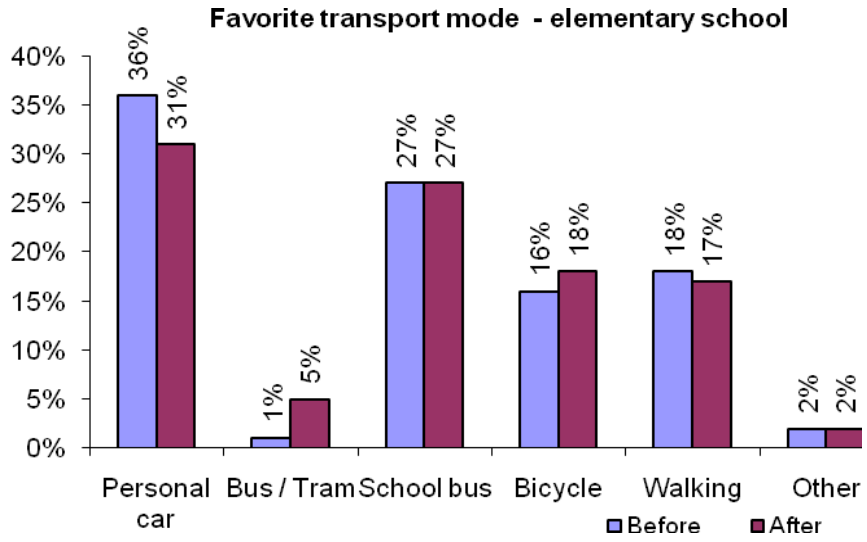


Fig. 12 Favourite mode of transport

If they were to choose the means of transport they would like to use for their trips between home and school (Fig. 12), much more pupils would go by school bus (27% - before and after implementation) than those who actually do. Many would also prefer to ride a bicycle (16% - before and 18% - after). These preferences are related especially to the desire of pupils to travel to school with their colleagues (by school bus), and to shift to a transport mode that is fun to use and that would make them feel more responsible and independent (bicycle riding). Thus, the number of pupils moving between home and school in their parents' car would decrease (36% - before and 31% after) if their choices were materialised, but at the same time there would also be a decrease in number of those using public transport (by 1% before the measure was implemented and by 5% after implementation).

Table C.2.1.4.2 Average modal split – secondary school

570 students aged between 10 and 15 were interviewed.

Secondary school students	Home to school		School to home		Favourite mode of transport	
	Before	After	Before	After	Before	After
Personal car	29%	20%	23%	15%	40%	33%
Bus / Tram	45%	51%	47%	54%	12%	17%
School bus	0%	1%	0%	1%	20%	21%
Bicycle	1%	4%	1%	4%	13%	18%
Walking	24%	23%	27%	24%	12%	10%
Other	1%	1%	2%	2%	3%	1%

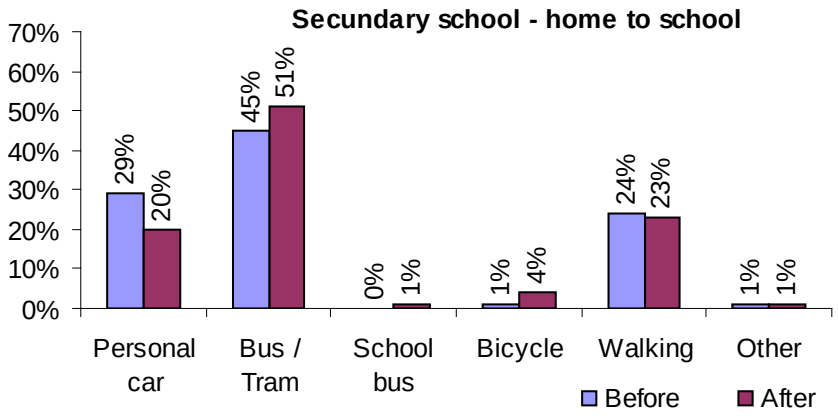


Fig. 13 Mode of transport from home to school

For moving from home to school (Fig. 13) before the implementation of the measure 29% of the interviewees were driven by their parents, 45% used public means of transport, 24% went on foot, 4% used bicycles, and 1% other means of transport. After the measure was implemented, the percentage of the respondents who were driven to school by their parents decreased to 20%, that of the students who used trams of buses increased by 6%, trips by bicycles increased by 3%, the percentage of those who went on foot decreased by 1%, and the trips by school bus increased by 1%.

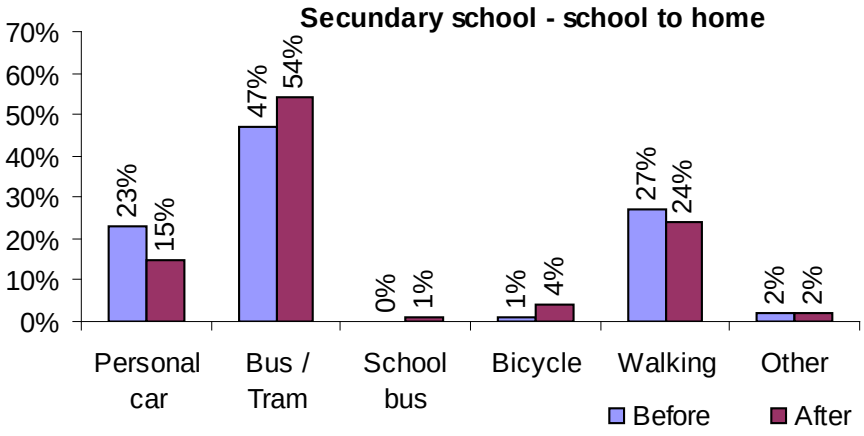


Fig. 14 Mode of transport from school to home

Fig. 14 shows that, while before the implementation of the measure 23% of the respondents were driven by parents to home, 47% used public means of transport, 27% walked, 1% used bicycles, and 2% other modes of transport, after the measure was implemented trips by private cars decreased by 8%, trips by bus or tram increased by 7%, those by bicycles by 3%, those by school bus by 1%, and the percentage of the respondents who chose to walk decreased by 3%.

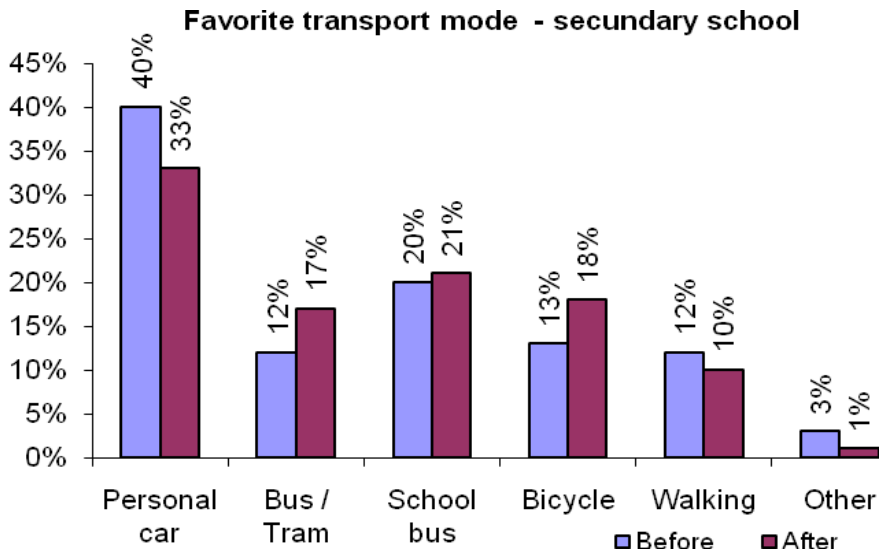


Fig. 15 Favourite mode of transport

As for the preferences of secondary school students (Fig. 15), we note that most of them would rather be driven by their parents (40% - before and 33% after the implementation of the measure). Second comes the school bus, if one were available for them (20% - before and 21% - after). They would use bicycles (13% - before and 18% - after) if an adequate infrastructure were available throughout the city (cycle routes and bicycle parking racks in schools).

The high percentage of students who prefer going to and from school by car may be due, on the one hand, to the fact that this grew into a habit for part of them, who were already used to this mode of transport since primary school, and, on the other hand, to the fact that private cars are regarded not only as a comfortable means of transport, but also as an indication of financial comfort. School buses are also among the most favourite means of transport because of students' desire to travel to school together with their colleagues. Many of the secondary school students interviewed indicated the bicycle as favourite transport mode, which is, indeed, an effective way of transport given the crowded streets during rush hours.

If all these preferences were put into practice, they would cause a significant decrease in public transport use (the percentage would have come down to 12% before and 17% after implementation), but also in the percentage of students who go between home and school on foot, (it would have reached 12% before and 10% after).

Table C.2.1.4.3 Average modal split – high school and university

1180 high school and university students aged between 15 and 23 were interviewed.

High school and university students	Home to school		School to home		Favourite mode of transport	
	Before	After	Before	After	Before	After
Personal car	13%	10%	6%	4%	53%	46%
Bus / Tram	55%	58%	59%	61%	9%	14%
School bus	1%	1%	1%	1%	16%	16%
Bicycle	1%	6%	0%	6%	6%	14%
Walking	27%	23%	31%	27%	13%	9%
Other	3%	2%	3%	1%	3%	1%

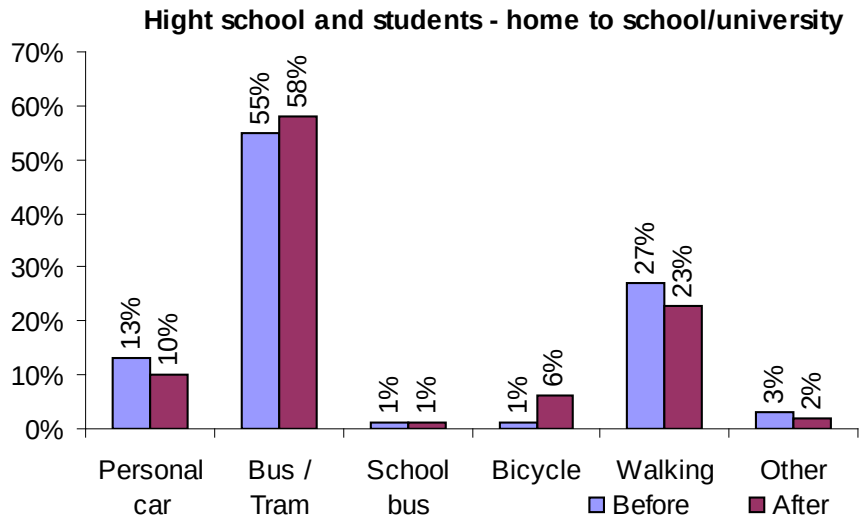


Fig. 16 Mode of transport from home to school/university

Regarding the modes of transport high school and university students used to go from home to school/university (Fig. 16), before the implementation of the measure 13% of the interviewees used private cars (they were either driven by their parents or they drove themselves), 55% went by public means of transport, 1% used school buses, 1% bicycles, 27% went on foot, and 3% used other modes of transport. After the measure was implemented, the percentage of the respondents who used private cars decreased by 3%, the number of trips by school bus remained constant, the number of trips by bicycle increased by 5%, the percentage of the respondents who chose to walk to school decreased by 4%, and the use of other modes of transport decreased by 1%.

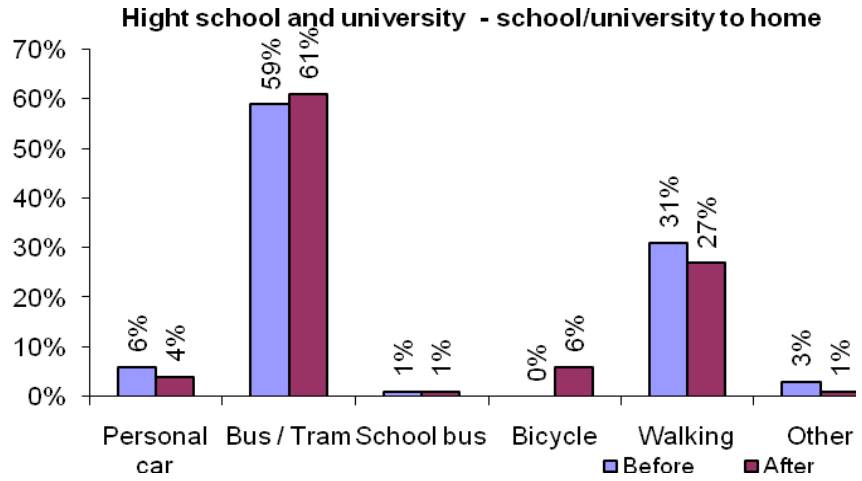


Fig. 17 Mode of transport from school to home

Figure 17 shows that, before the measure was implemented, 6% of the respondents used private cars for going back home from school/university, 59% used public transport, 1% school buses, none used bicycles, 31% went on foot, and 3% used other modes of transport. After the implementation of the measure trips by private cars decreased by 2%, those by public means of transport increased by 2%, those by school bus remained constant, those by bicycle increased by 6%, the percentage of the respondents who chose to walk decreased by 4%, and the use of other modes of transport decreased by 2%.

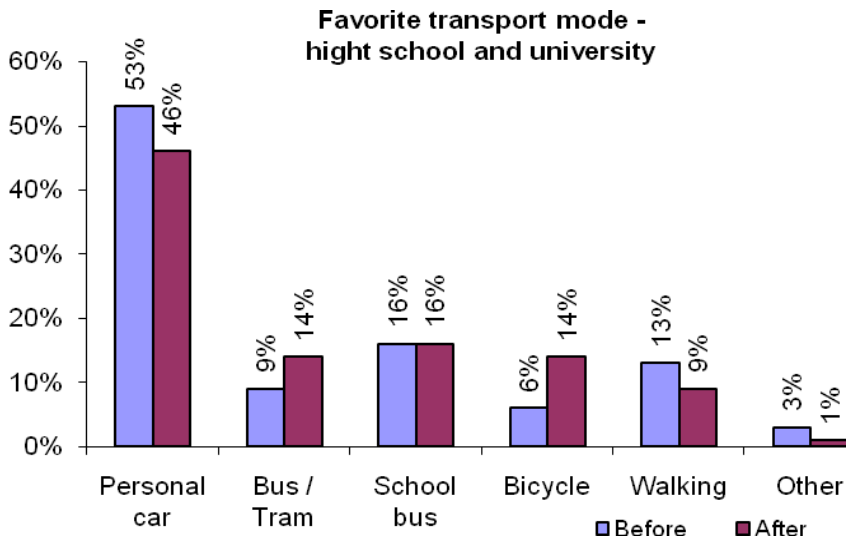


Fig. 18 Favourite mode of transport

With reference to preferences, the distribution of the results (Fig. 18) is very much different from the actual habits of the respondents. Private cars are clearly the favourite option, with 53% (before) and 46% (after) of the respondents. Only 9% (before) and 14% (after) declared they would prefer public transport, which is far less than the actual number of users of this mode. 16% of the interviewees would rather go by school bus, and 6% (before) and 14% (after) would prefer to cycle, while the number of students who would walk to school would decrease to 13% (before) and 9% (after).

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	The implementation of transport plans for school and university students	★★
NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%) ★★ = Achieved in full ★★★ = Exceeded		

C4 Upscaling of results

Students of other schools and universities in Iasi can be encouraged to use environmental-friendly modes of transport instead of personal cars, and transport plans to meet their needs can be implemented.

C5 Appraisal of evaluation approach

There were no major problems in evaluation, but if this assessment had been made from the very beginning, probably the interviews would have been conducted on a much larger sample of citizens in different parts of the city so that the measure impact could be demonstrated at city level.

C6 Summary of evaluation results

On assessing the indicators set for this measure we noticed:

- an increase to 46%, in 2012 of the students interviewed who knew about the school travel plans implemented through ARCHIMEDES, compared to 37% in 2011.
- that the acceptance level indicator, which we used to evaluate the positive impact on passengers that the implementation of school travel plans had, increased from 63% in 2011 to 72% in 2012.

- the increase of the level of perception of accessibility regarding:
  - ✓ the arrival at the destination by public means of transport within reasonable time: 49% in 2011, 55% in 2012
  - ✓ the quality of the conditions provided by public means of transport: 22% in 2011, 27% in 2012
  - ✓ the viability of public means of transport as an alternative to private cars: 53% in 2011, 58% in 2012
  - ✓ the lower degree of pollution caused by public transport than by private cars: 64% in 2011, 78% in 2012
  - ✓ the improvement of traffic flow within the city if public transport were more frequently used: 71% in 2011, 79% in 2012.

- the variation of the average modal split after the implementation of the measure; the number of trips by:
  - ✓ Elementary school:
    - private car decreased by 7%
    - tram or bus increased by 4%
    - bicycle increased by 1%
  - ✓ Secondary school:
    - private cars decreased by 9%
    - tram or bus increased by 7%
    - bicycle increased by 3%
  - ✓ High school and university:
    - private cars decreased by 3%
    - tram or bus increased by 3%
    - bicycle increased by 6%

C7 Future activities relating to the measure

Iasi will continue to maintain the School Travel Plans and the contact with the schools and universities involved in this measure.

D Process Evaluation Findings

D0 Focused measure

x	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviation from the original plan

1. Five universities were to take part in the project according to the DOW. However, since one of them ("Mihail Kogalniceanu" University) was going through a period of reorganisation at the time the meetings with students were supposed to take place, we decided that we could give up collaboration with it without affecting the achievement of our goals, because its number of students was insignificant (around 500 in the year 2009-2010) compared to the total number of university students in Iasi. The number of questionnaires distributed in universities to study students' behaviour regarding mobility was large enough to compensate for the number of students of "Mihail Kogalniceanu" University who did not take part in the project, and so was the number of the students involved in debates. The sample size of the category "high school and university students" was 1180 students and it ensured statistical representativity of the students in Iasi.

2. A new indicator, average modal split, was introduced for the evaluation of the measure in order to study after its implementation the change in travel behaviour of the students from the schools and universities involved. A positive aspect in assessing this indicator was the large sample size – almost 2000 students.

D2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **5. Involvement, communication**: Insufficient involvement or awareness of key stakeholders.
- **6. Positional**: The innovative character of the measure (no previous experience in the elaboration of school travel plans).

Implementation phase

- **5. Involvement, communication**: Difficulties in establishing good communication and participation of school and university students, teachers and parents.

Operation phase

- **4. Problem related**: Difficulties in achieving some of the objectives established in the school travel plans

D.2.2 Drivers

Preparation phase

- **1. Political/strategic**: The measure concerned is part of a (city) program and/or a consequence of the implementation of a sustainable vision

Implementation phase

- **7. Planning**: Accurate technical planning and analysis/studies to determine requirements of measure implementation
- **6. Positional**: Exchange of experiences and lessons learned from other measures or cities

Operation phase

- **6. Positional**: Make use of the results and conclusions of the previously made study

D.2.3 Activities

Preparation phase

- **5. Involvement, communication**: Consultation of target groups by means of workshops, expert meetings, face-to-face interviews or questionnaires, campaign for public awareness on the sustainability problems to be solved, bringing together key stakeholders to discuss the sustainability problems to be solved (sharing different viewpoints)

Implementation phase

- **5. Involvement, communication**: Involvement of key stakeholders in the measure
- **5. Involvement, communication**: Efforts were made in order to improve the dialogue with school and university students, teachers and parents

Operation phase

- **4. Problem related**: Difficulties were identified and solutions were found in order to achieve the objectives

D3 Participation

D.3.1 Measure partners

- **Municipality of Iasi (Leading role)**
  - in charge with organising the survey for a better understanding of students' travel behaviour and of their favourite modes of transport between home and educational institutions;
  - in charge with developing school travel plans for students;
  - in charge with organising debates with students, teachers and parents and with planning the meetings aimed at disseminating the results and suggestions regarding the transport plans.
- **Public transport company (Occasional participant)**
  - representatives of the public transport company participated in the meetings organised by the Municipality of Iasi;
  - in charge with providing background information about public transport services;
  - in charge with fulfilling its responsibilities regarding the school travel plans: to increase the number of public transport vehicles to offer proper transport conditions, to introduce environmentally-friendly vehicles, to improve the methods for informing people about public transport services, etc.
- **Schools and universities (Occasional participants) –** the head of the 11 schools and 4 universities involved in the measure approved the meetings organised by the Municipality of Iasi within these educational institutions.
- **Technical University Iasi (Occasional participant)** – organizing surveys, by face-to-face interviews, for the assessment of the measure.

D.3.2 Stakeholders

- **School and university students** – participated in surveys aimed at establishing their transport habits. They benefited directly from school travel plans.
- **Parents** – they are not involved in the implementation of the measure, but they are affected by the measure.
- **School principals and university rectors** – allowed the Municipality of Iasi to organise meetings in schools and universities.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Transferability**. This measure has a high degree of transferability because in almost every city there are students willing to change their travel behaviour. Their transport needs have to be identified and they have to be explained the benefits of sustainable transport. The most successful method therefore is to organise meetings with students and teachers, and even with parents. The parties involved in such a project (the municipality, the public transport company, specialists in environmental issues) should work closely together in order to ensure coherence to the project.

D4.2 Recommendations: Learning from the experiences of the measure

- **Approach methods**: The way to achieve the best results is by means of dialogue. The students should be gently guided towards reaching the right conclusions themselves, with little perceivable help from the persons trying to raise their awareness on the global environmental problems. The teachers and parents should participate not only in these meetings, but separate sessions can be held only with them, in order to develop strategies on how to continue to educate their students and their children, respectively.
- **Involvement, communication**: Consultation of target groups (schools and universities) by means of workshops, expert meetings, face-to-face interviews or questionnaires, campaign for public awareness on the sustainability problems to be solved, bringing together key stakeholders to discuss the sustainability problems to be solved (sharing different viewpoints).
- **Involvement, communication**: Campaigns for raising the awareness of school and university students about the importance of using public transport and alternative means of transport to private cars should be organised not only once, but on a regular basis. It would be advisable that not only students, but also teachers and parents take part in workshops and lectures, so that they become aware of their role in the education of young generations on this matter. Campaigns are always more attractive when presentation materials are available.

Annex 1 Questionnaire administered to almost 2000 students of 11 schools and 4 universities

Questionnaire
Educational institution……

In order to help draft of transport plans for school and university students, please answer the following questions:

1. What are you currently attending:
   - □ elementary school
   - □ secondary school
   - □ high school
   - □ university

2. What is the distance from your home to school?
   - □ < 500 m
   - □ 500-1000 m
   - □ > 1000 m

3. What is the means of transport you use the most in order to get from home to school:
   - □ personal / parents' car
   - □ bus / tram
   - □ school bus
   - □ bicycle
   - □ walking
   - □ other

4. What is the means of transport you use the most when you come home from school:
   - □ personal / parents' car
   - □ bus / tram
   - □ school bus
   - □ bicycle
   - □ walking
   - □ other

5. If you were to choose your favourite means of transport for getting from home to school and back, which would you pick:
   - □ personal / parents' car
   - □ bus / tram
   - □ school bus
   - □ bicycle
   - □ walking
   - □ other

6. Write down an action or a measure which could make you use other means of transport than the personal car in order to get from home to school.

……
……

ANNEX 2 – Questionnaire administered to 100 school and university students. Place: a public transport stop

M. 37 – School travel plans

1. What is your level of education:

middle school	high school	university

2. When I go by public means of transport, I prefer to use a:

one-trip ticket	two-trip ticket	set of 10 trips	monthly season ticket

3. How often do you use public transportation?

..... (How many times a week / a month / occasionally ...)

4. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?

yes	no	I don't know

5. Has the public transport company, as a part of the CIVITAS project, implemented transport plans for students aiming at educating them on the benefits of sustainable transport?

yes	no	I don't know

6. Does the implementation of a transport plan for students contribute to the improvement of traffic flow within the city with an impact on pollution levels in Iasi?

yes	no	I don't know

7. To what extent do you consider that educating students about the benefits of sustainable transport and introducing dedicated transport plans help solve the following problems (with a grade from 1 to 5, where 1 equals "total disagreement" and 5 "total agreement"):

- traffic jams during rush hours	1	2	3	4	5
- high level of pollution generated by heavy traffic	1	2	3	4	5
- low level of safety for students moving between home and school	1	2	3	4	5
- lack of physical exercise and poor social interaction of students	1	2	3	4	5

8. To what extent do you agree that the following measures have helped improve the mobility of students in Iasi (with a grade from 1 to 5, where 1 equals "total disagreement" and 5 "total agreement"):

- organising events to promote the use of alternative modes of transport (walking, cycling, public transport) among students	1 2 3 4 5

- increasing the number of buses and trams to ensure higher frequency of public means of transport at the beginning of school / university year	1 2 3 4 5
- introducing season tickets with special prices for students	1 2 3 4 5
- improving the information on public transport (website, information panels in stops, free telephone line, etc.)	1 2 3 4 5

9. To what extent do you agree with the following statements (with a grade from 1 to 5, where 1 means "total agreement" and 5 "total disagreement"):

I can reach anywhere in the city within reasonable time when I use public means of transport.	1 2 3 4 5
The public transport company provides a modern and civilised service	1 2 3 4 5
Public transport is a viable alternative to personal cars	1 2 3 4 5
Public transport pollutes less than personal cars	1 2 3 4 5
If people in Iasi used public transport more frequently, the city would be less polluted and less crowded.	1 2 3 4 5

10. Do you have any suggestions for improving the way students in Iasi move between home and school/university?
    .....

Thank you!

Executive summary

The toll-free telephone service is a communication path used by many institutions to send information to users of its services and get feedback from them. The Municipality of Iasi and the public transport company used the opportunity provided by the ARCHIMEDES project to establish a new communication line with passengers. After contacting a specialised company, a contract was signed and a toll-free telephone service was installed within the dispatch centre of the public transport company. Specialised personnel offer information about public transport services, and record complaints and suggestions around-the-clock.

The following methods for determining the indicators were used for the evaluation of this measure:

- surveys were carried out through face-to-face interviews, with the following results:
  - The quality of service indicator shows a growing in the respondents' satisfaction with this service, the percentage rising from 10% in 2011 to 21% in 2012.
  - Thanks to a parallel communication campaign providing information on public transport including this service, more and more people got to know about the free telephone line: the awareness level indicator increased to 31% in 2012 compared to 20% in 2011.
  - 39% of the interviewees used the toll-free telephone service in 2012 compared to 26% in 2011.

- On analysing the statistics submitted by the company who provided this telephone service, we noticed a very high number of phone calls each year: 7212 in 2010, 6944 in 2011, and 3006 within January-June, 2012.

The following can be regarded as lessons that were learnt during the implementation of this measure:

- in order to improve its image, a public transport company does not only have to invest in infrastructure (extension and/or modernisation of the vehicle fleet, of the tram tracks, etc.), but also in creating direct communication links to (potential) passengers, so that they have instant access to information regarding its services;

- a toll-free telephone line has the downside of being used also by ill-intended people, which makes it important that operators be able to handle appropriately any situation;

- the reaction of claimants when they are called back and given an answer to their complaints is usually positive; the prompter the answer, the more satisfied the beneficiary of the service – many even have words of praise when they receive the answer sooner than anticipated.

After having evaluated this measure we can state that the toll-free line has offered and will continue to offer passengers the feeling that the transport company does more than just provide a transport service; it also cares for the opinions and needs of its clients and therefore it always keeps a direct communication channel open and tries to follow, as far as possible, their suggestions.

IAS 38 - Travel Information Telephone Service in Iasi

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To promote high quality, high efficient, and more attractive public transport services.

(B) Strategic level:

- To keep a permanent relationship with passengers from anywhere in the country and at any time of the day and night.

(C) Measure level:

- To create a free telephone service so that people can easily communicate with the public transport company, and to have as many users of this service as possible.
- To help passengers, both inhabitants of the city and visitors, to choose the optimum route in order to get to the desired location as fast as possible.
- To inform passengers on all aspects of the services offered by the public transport company: routes, timetables, prices of ticket and season tickets, etc.
- To offer passengers the possibility to make complaints and suggestions about all constituents of the public transport services.

A1.2 Target groups

.

The communication between the transport company and the people using its services is made mostly through the two main channels that are the easiest to use: the Internet and the telephone. The access to both is free of charge and they are complementary to each other. The communication via the toll-free telephone line is the easiest to establish, and the impact on the person who calls may be more direct than when using the Internet: when the passenger is in a public means of transport or at a stop, he or she may need urgently information on the transport service, and the only possibility to get an answer in a matter of seconds is via telephone. When people want to make complaints or suggestions, or when they do not necessarily need a quick answer to their questions, they can use the Internet to contact the transport company. Both services are accessible to people living anywhere in the country, who may wish to ask for information before arriving in Iasi. Hence the target groups are the inhabitants of Iasi and the visitors of the city.

A2 Description

The public transport company started a toll-free telephone line that connects citizens with the dispatch centre. People can make free phone calls to a special number (0 800 110 427) and an employee of the public transport company offers them all information they need about public transport services. Passengers can make a call even if they are inside a public means of transport and want to know what route to follow in order to get to the desired location. The same phone number is used for making complaints and suggestions, which are recorded, analysed, and solved if possible.

A3 Person in charge for the evaluation of this measure

Names of persons	George Mocanu - implementation Cristian Stoica - evaluation
Name of organization	PTI
Direct telephone	+40722229502
e-mail	dir_tehnic@ratp-iasi.ro

B Measure implementation

B1 Innovative aspects

Innovative Aspects:
The innovative aspects of the measure are:

- **New mode of transport exploited** – The more information people can get directly from the public transport operator, the more satisfied they will be and the more frequently the will use public transport services.

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

Previously there was no easy and fast way for passengers whithout Internet connection to get information about the public transport in Iasi in general and about how they can get from one point to another and how fast in particular.

The ways to get such information were through information panels placed in stops, by asking the personnel from the ticket vending kiosks of the transport company, or by accessing the company's website.

B4 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Identifying the proper company (*October 2009*) **–** Based upon the data mentioned in Description of Work, a specialized company was contacted in order to implement the toll-free telephone service line.

Stage 2: Implementation of the measure (*October 2009*) – A contract was signed and the telephone line was installed within the dispatch centre of the public transport company

Stage 3: Promotion of the service (*November 2009***) –** the special free telephone line was promoted through flyers, stickers, etc.

Stage 4: Collection of data (*beginning with November 2009*) – we can access statistics regarding this telephone service on the telephone company's website using an ID and a password.

Stage 5: Surveys (*February 2011 and February 2012*) – face-to-face interviews were organised to assess the impact of the measure.

The aim of this dedicated telephone line is to offer people the opportunity to promptly obtain information on public transport services (Fig. 1). Information for route planning purposes is provided in real time. Moreover, operators are able to receive feedback and suggestions from public transport users. The suggestions and complaints arrive at the Public Relation (PR) Department, which selects all the information received from passengers and sends it to different departments (exploitation, technical, legal advisors). Those departments analyse the requests and send the answer back to the PR Department. The PR Department, sometimes together with the management of the public transport company, if necessary, reviews the answers and sends them to the persons who had asked for information. According to Romanian law, the public transport company must provide an answer within 30 days.

The time elapsed from the moment an event takes place to the moment the claimant receives an answer to his or her complaint has considerably decreased since this service has been put into

operation. The reason may be that, once an event takes place, it usually takes hours or even days until it is reported using other communication channels (e-mail, fax, complaint written by hand), because the claimant does not have access to them immediately after the event occurs, and he or she may even forget the incident for some time and remember about it only some days later. Such delays may sometimes make it impossible to solve the complaints.

Another positive impact of this measure is that, in certain circumstances, the complaint is solved in just a few dozens of minutes. Immediately after a phone call is received announcing an event taking place or that has just occurred (e.g. a person spotted inside the driver's cabin, a driver accepting money for taking a passenger without a ticket or selling validated tickets to passengers), a team from the Department of Traffic Safety of the public transport company goes on the route the driver is on, and chances are high that they get evidence on the incident.

This measure and the way the problem-solving process is organised are intended to encourage passengers come into contact with the transport operator. Not only does the quality of transport services improve thanks to some of the issues passengers raise, but also new links are created with each passenger receiving an answer to his of her question. This is how passengers realise that what they have to say about public transport services matters to the transport operator and thus the level of trust towards the company increases.

Fig. 1 The telephone used for communicating with public transport users

This telephone line is promoted through different channels:
- radio and TV spots
- local newspapers
- posters placed in every transport vehicle and in every bus station (Fig. 3, Fig. 4, Fig. 5).
- the website of the transport company (Fig. 2).

Fig. 2 The home page of the public transport company of Iasi

Fig. 3 Toll-free telephone poster on a bus

Fig. 4 Toll-free telephone poster inside a minibus

Fig. 5 Toll-free telephone poster on a minibus

B5 Inter-relationships with other measures

- This measure is related with Measure IAS 76 – Bus Management System: the complaints and suggestions received through the toll-free line are written in a file which is part of the Incident Management Software implemented through Measure 76, and they are sent to the corresponding departments of the public transport company in order to be handled
- This measure is also related to Measure IAS 36 – Public Transport User Forum in Iasi because they both create communication channels between the public transport company and the users of its services (the first by phone, the latter through the Internet)

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

- the main impact is on every person in the city that wants to or uses public transport services;
- another impact is on the image of the public transport company, which has opened a better communication channel for public transport users, which helps improve the quality of services.
- the time of solving complaints has reduced because incidents can now be reported immediately after they occur.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ECONOMY					
2b			Capital Costs	Capital costs	Total costs for implementing the measure	**euro**
2			Operating costs	Operating costs	Operating costs	euro
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
	TRANSPORT					
19		**Quality of Service**	Quality of service	Quality of service	Survey	Index (%)
NEW				Users	Number of calls	Counting

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2b	Capital costs	102 euro	Costs of promotional materials	Once, when promotional materials are distributed
2	Operating costs*	as low is possible	10 euro/month is the cost of the reservation of the special number (0 800 110 427) + costs of the calls + labour costs with the telephone operators.	monthly
13	Awareness level	Increased level of awareness	After the implementation of the measure surveys were conducted to assess these indicators. The interviews** were carried out by students in a public transport stop during five working days both in 2011 and in 2012. 100 persons were interviewed in each of the two years.**February 2011 and February 2012.** In order to assess the awareness level, the respondents were asked if they had heard about the CIVITAS project and if they knew that a toll-free telephone service was created to offer useful information about public transport services and to collect suggestions/complaints from passengers. Regarding the acceptance level indicator, the interviewees were asked if they used this telephone service to obtain information on public transport and to transmit suggestions that may help the company improve its services. To evaluate the quality of service indicator we tried to measure the level of passengers' satisfaction regarding the information offered by the transport company and the capacity of the personnel working in the dispatch centre to answer the questions asked by means of this toll-free telephone service.	February 2011 and February 2012
14	Acceptance level	Increased level of acceptance		
19	Quality of service	increased		
NEW	Users	At least 60 users/month	The number of phone calls received through the toll-free line was taken from the website of the telephone company	monthly

* The "maintenance costs" indicator has been replaced with "operating costs"

** The questionnaire is to be found in Annex 1.

C1.1.3 Planning before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	2b,2c, NEW - users	Not applicable	---
	13, 14, 19		
Collection after data	2b, 2c, NEW - users	Monthly	PTI
	13, 14, 19	M 30, M 42	
D12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

Before this measure was implemented, people could obtain information on public transport services from information panels placed in stops, by asking the personnel from the ticket vending kiosks of the transport company, by writing e-mails to the transport company or by accessing its website.

We take 2008 as reference year. Since this is a new measure, we have no data on the costs of installing a free telephone service, neither had any surveys been conducted to assess people' s opinion on the introduction of this communication channel

The following indicators were collected after the implementation of the measure :

- the capital costs are represented by the costs of promotional materials; the data was provided by the public transport company;
- the operating costs are composed of the costs with reserving the special telephone line from the provider, and with the operators of the transport company who answer the phone;
- the number of users of the toll-free line was taken from the website of the provider of the telephone service;
- the awareness level, acceptance level and quality of service were assessed by surveys.

The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The interviews were carried out in the same public transport stop during the two periods the surveys took place after the implementation of the measure. The 100 respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the two periods differed one from another each year.

We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

C1.3 Methods for Business as Usual scenario

Up to the implementation of this measure passengers were not able to get all information they needed about public transport or to make complaints or suggestions when they were in stops or in public means of transport.

C2 Measure results

C2.1 Economy

Table C2.1.1 Capital costs

Indicator	2009
2b Capital costs	102 Euro

Capital costs are represented by the costs of promotional materials meant to inform people about the new, easy-to-use and fast means of communicating with the public transport company. These costs were covered from the budget of the transport company.

Table C2.1.2 Operating costs

Indicator	After (2010)	After (2011)	After (2012)
2 Operating costs	6,793 Euro	6,548 Euro	6,272 Euro

Operating costs per month include (Table 1):

- toll-free telephone line subscription (10 Euro/month);
- total costs of received phone calls on the basis of the financial documents received from the telephone service provider;
- labour costs of the telephone operators – an average of 10% from the activity of the employees of the transport company working in the main dispatch centre are dedicated to answering the phone (358 €/month).

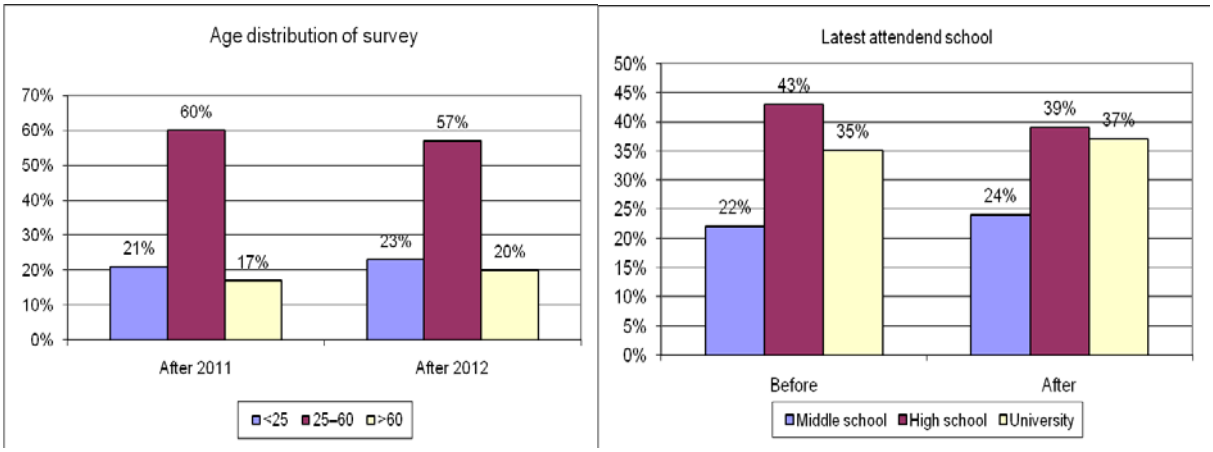
Operating costs (euro)	2010	2011	2012*
toll-free telephone line subscription	120	120	120
costs of received phone calls	2,377	2,132	1,856
operators in the main dispatch centre (6 persons; 10%)	4,296	4,296	4,296
Total	6,793	6,548	6,272

Table 1 Operating costs

*The costs for 2012 are based on the data recorded in the interval January-June, which were then extrapolated to the whole year (they were multiplied by 2).

C2.3 Transport

The interviews for determining the quality of service indicator were conducted by students, in the same bus stop in both periods after implementation. A characterisation of the respondents is provided in the tables below (Fig. 6).



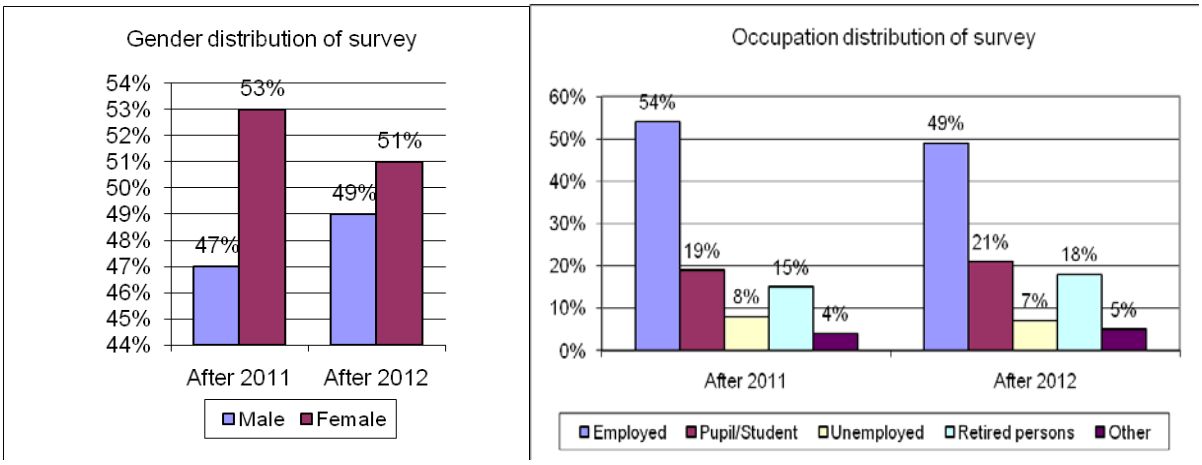


Fig. 6 Details of the survey's respondents

On analysing the characteristics of the respondents (Fig. 6), we notice the following evolutions in the "before" and "after" situations:

- most of the interviewees are within the 25 to 60 year-old bracket (60% and 57%, respectively);
- most of them have attended only high school (over 39%) or also university (over 35%);
- 47% and 49%, respectively, are male, and 53% and 51%, respectively, are female;
- most of the respondents are employed (54% and 49%, respectively).

Table C2.3.1 Quality of service

Indicator		Before (date)	After (2011)	After (2012)
19. Quality of service	1. totally satisfied	NA	2%	8%
	2.	NA	8%	13%
	3.	NA	42%	41%
	4.	NA	33%	28%
	5. totally dissatisfied	NA	15%	10%

For the evaluation of this indicator, respondents were asked to answer how satisfied they are about the following aspects regarding the services of the public transport company (the level of satisfaction was measured on a 1 to 5 scale, where 1 equals "total satisfied" and 5 "total dissatisfied"):

a. the information provided to passengers using the toll-free telephone line.

b. the capacity of the transport company's employees to answer the complaints, suggestions and questions of passengers who call using the toll-free service.

Both the table above, C2.3.1, and the graphical representation of the quality of service indicator contain the average of the percentage value resulted from the answers to the two questions for each of the five satisfaction levels.

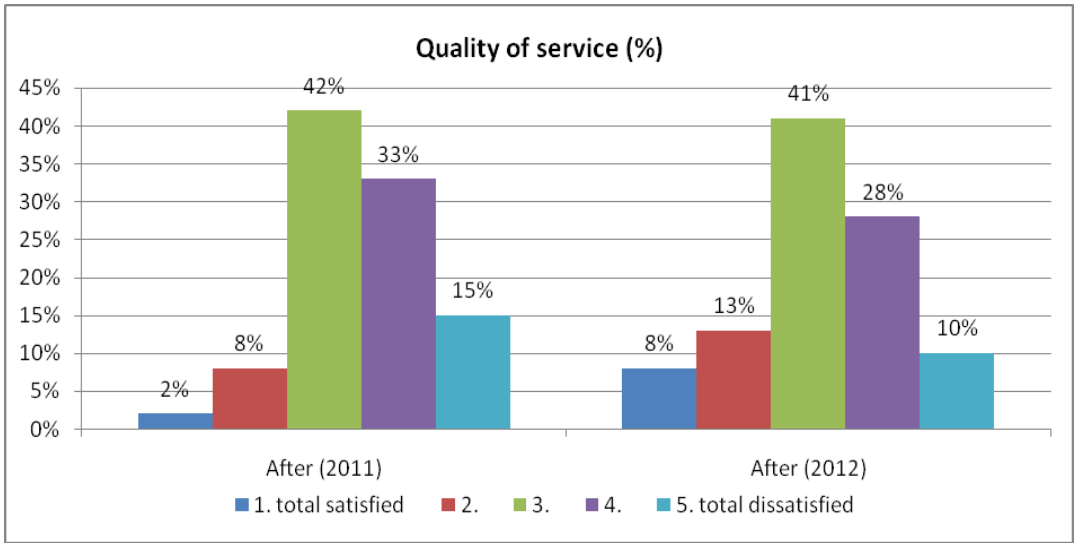


Fig. 7 Quality of service

On analysing the data from Fig. 7, we notice an increase of the percentage of persons satisfied with the information received. The personnel working within the dispatch centre was able to answer all the questions asked through the toll-free telephone service in 10% (points 1 and 2) of the instances in 2011 and in 21% of the instances in 2012. The percentage of undecided respondents (point 3) remained almost constant, around 41%-42%.

C2.4 Society

The details on the categories of respodents who were interviewed in order to determine the awareness level and acceptance level indicators are provided in Figure 6 above.

Table C2.4.1 Awareness level

Indicator		Before (date)	After (2011	After (2012)
13. Awareness level	1. Yes	NA	20%	31%
	2. No	NA	17%	11%
	3. I don't know	NA	63%	58%

The values of the awareness level indicator result by combining the two questions mentioned further below. Since a single questionnaire was used for the evaluation of both Measure 38 (toll-free line) and Measure 36 (web forum), question b. of the questionnaire used in 2011 comprised both communication channels: "Has the public transport company introduced, as part of the CIVITAS project, a special toll-free telephone line (TELVERDE – 0800) and a web forum that enable citizens to get information and express suggestions or complaints about the public transport services in Iasi?"

In order to get more accurate results for the year 2012 for each of the two measures, we used a separate questionnaire. The following questions were asked in relation to Measure 38 (see Annex 1):

a. Does the city of Iasi participate in the CIVITAS project, which is partially funded by the European Union?

b. Has the public transport company introduced, as part of the CIVITAS project, a special toll-free telephone line (TELVERDE – 0800) that enables citizens to get information and express suggestions or complaints about the public transport services in Iasi?

Both the table above, C2.4.1, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

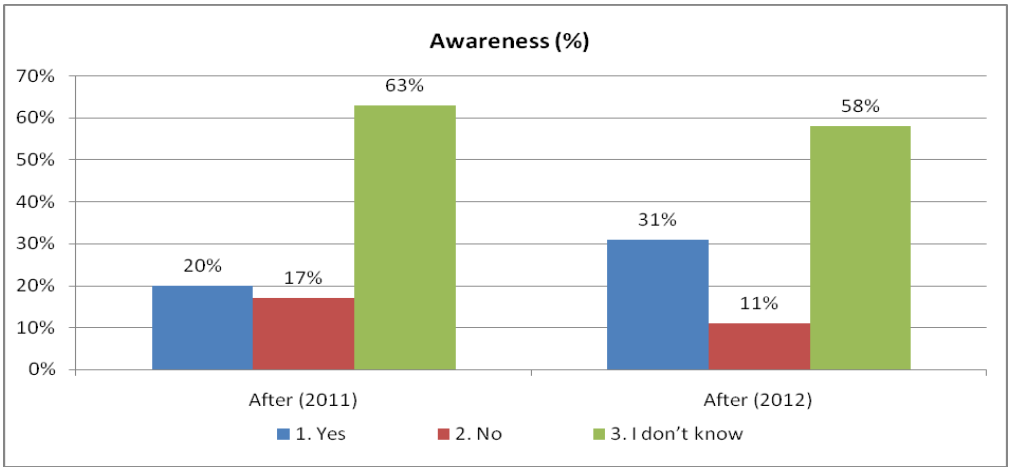


Fig. 8 Awareness level

The data resulted from the survey of the awareness level indicator (Fig. 8) shows that after implementation the percentage of people knowing about the new telephone service increased to 31% in 2012, compared to 20% in 2011.

Table C2.4.2 Acceptance level

Indicator		Before (date)	After (2011)	After (2012)
14. Acceptance level	1. Yes	NA	26%	39%
	2. No	NA	48%	39%
	3. I don't know	NA	26%	22%

Regarding the acceptance indicator, respondents were asked the following questions:

a. Do you use the toll-free telephone line to get information about the public transport company's services?

b. Do you use the toll-free telephone line to send your suggestions / complaints about the public transport company's services?

Both the table above, C2.4.2, and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

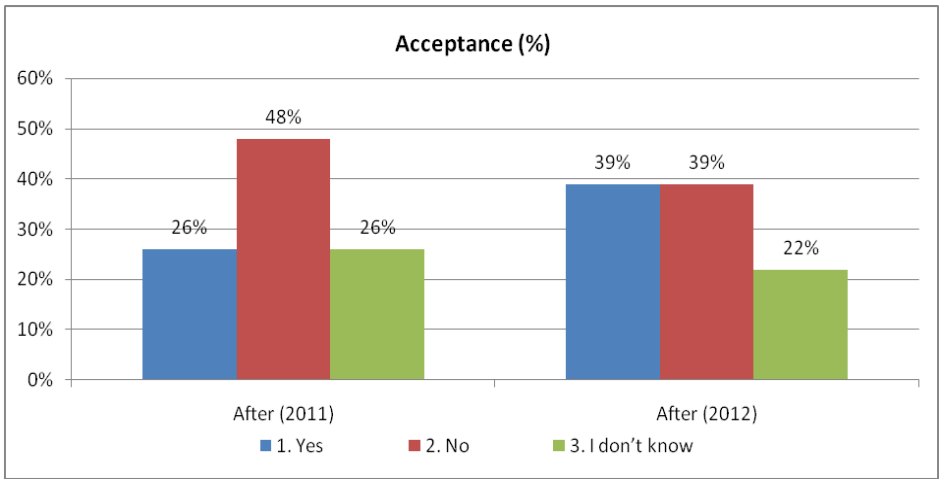


Fig. 9 Acceptance level

After comparing the data on the acceptance level indicator, we noticed that 39% of citizens used the toll-free telephone line in 2012 compared to 26% in 2011 (Fig. 9).

Table C2.4.3: Users

Indicator		Before (date)	After -Annually-	Monthly average
New, Users	2009 November-December	NA	921	461
	2010	NA	7212	601
	2011	NA	6944	579
	2012 January - June	NA	3006	501

The telephone company contracted has offered the transport company the possibility to log on their website in order to access information on the number, duration and time intervals of phone calls. The web address is https://client.ines.ro/ and this is where the data in table C2.4.3 above resulted from. The number of calls in 2009 was counted for the period November-December, and the number of calls in 2012 only for the period January-June (Fig. 10).

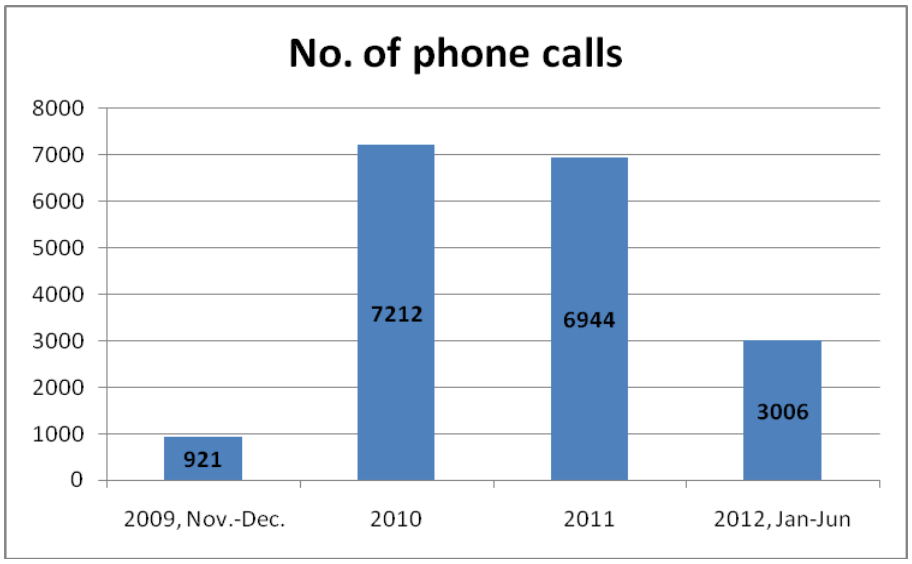


Fig. 10 Number of phone calls per year

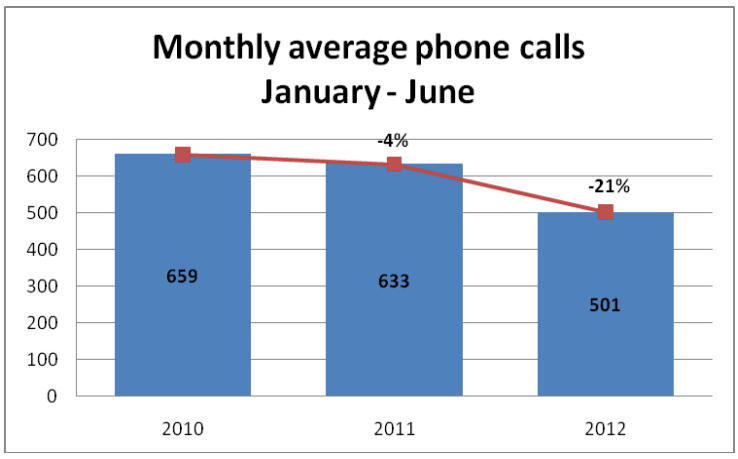


Fig. 11 Monthly average number of phone calls

In order to compare correctly the monthly average number of phone calls, we only took into account the period January-June for the years 2010, 2011, and 2012. On calculating the monthly average number of phone calls (Fig. 11), we noticed that the highest value was recorded in 2010 (659 calls), and that it decreased by 4% in 2011 and by 21% in 2012 compared to 2011.

Although the monthly average of the number of phone calls decreased in the first six months of 2012, this service is still intensively used by passengers.

Details on the nature of the calls made through the toll-free line are given in Table 2 below:

Indicator		After	From which:		
			Information on transport services	Suggestions and complaints	Miscellaneous
New, Users	2009	921	Not available	Not available	Not available
	2010	7212	2037	423	4752
	2011	6944	1988	318	4638
	2012 Jan.-June	3006	848	180	1978

Table 2 The annual evolution of the number of users

The calls made in order to make suggestions or complaints about the public transport services in Iasi were written down in a dedicated register. Here are some examples of complaints: inappropriate behaviour of drivers, ticket inspectors and ticket sellers towards passengers, failure of validators, dirty means of transport, drivers who missed a stop. Suggestions mostly refer to extensions of existing transport routes, creation of new lines, introduction of more vehicles on a certain route.

The requests for information (e.g. how to get from one point to another, when a certain line is going to resume its normal route in the context of construction sites) were not recorded because the operators were able to answer on the spot. Since there is no evidence of the number of calls with requests for information, we asked the operators to estimate it; the conclusion is that these calls represent about 30% of the calls that remain after subtracting from the total number of calls per year the number of calls made to give suggestions and make complaints.

Most of the remaining calls – under the heading "miscellaneous" – come from employees of the transport company (mostly drivers and ticket sellers) who share or ask for work-related information.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To install a toll-free telephone line	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

C4 Upscaling of results

Not applicable.

C5 Appraisal of the evaluation approach

This measure was assessed by means of:

- economic indicators, on the basis of which capital costs and maintenance costs were determined;
- indicators related to the number of users. There was a large number of people who used the toll-free line in order to request information on the public transport services and to make

complaints or suggestions. Both the transport company and the telephone service provider gave the necessary data for the analysis of these indicators;
- surveys conducted among the inhabitants of the city of Iasi in order to assess the awareness level, the acceptance level and the quality of service.

If this evaluation process were to be resumed, the interviews would probably be conducted on a much larger sample of citizens and in different parts of the city, so that the impact of the measure could be demonstrated at the level of the city.

The strong point of this measure is that, due to the large-scale development of communication systems at local and national level, almost everybody has (at least) one telephone. Using a telephone is also much more appropriate than accessing the Internet when it comes to making a complaint or asking for information at the transport company when one is in a public means of transport or in a stop. Moreover, any type of mobile telephone is appropriate for making a call, regardless of its performances. The feedback received from passengers thanks to the toll-free line is highly beneficial for the transport company because it helps improve the public transport services.

C6 Summary of evaluation results

The results obtained by evaluating the indicators set for this measure are:

- people interviewed are now more satisfied with the information / answers they receive through the toll-free telephone service, the quality of this service increasing from 10% in 2011 to 21% in 2012.

- the awareness level shows that more citizens know about this telephone service: their number increased to 31% in 2012 compared to 20% in 2011.

- the acceptance indicator revealed an increased level from 26% in 2011 to 39% in 2012, which means that more and more people are using this type of service.

- the number of phone calls is much higher than expected: between 500 and 600 per month.

C7 Future activities relating to the measure

We will continue to use the toll-free service after the project ends and we will also keep a permanent communication with citizens with a view to improving the quality of public transport services and to making them more attractive to all categories of potential users.

D Process Evaluation Findings

D0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviations from the original plan

There were no deviations from the original plan in the process of the measure implementation. "Maintenance costs" were replaced with "operating costs" within the evaluation process because the components of the first were found to belong to the latter.

D2 Barriers and drivers

D2.1 Barriers

Preparation phase

- **10. Technological**: The calls using this telephone line had to be free from all networks.

Implementation phase

- **10. Technological**: A suitable and reliable device for recording calls had to be identified (as part of the interconnecting measure 76, T8.11.3, Modules for Management of Incidents and Specific Equipment).

Operation phase

- **5. Involvement, communication**: Time was needed for the service to be advertised and for people to get used to using it.
- **5. Involvement, communication**: Apart from well-mannered and well-intentioned people using this service, there are also other types of persons: some complain of the public transport service in a totally disrespectful manner, others make complaints which, after several investigations, prove to be false, and others dial the free number only for fun.

D2.2 Drivers

Preparation phase

- **5. Involvement, communication**: In its continuous endeavour to improve its services, the public transport company felt the need of a better communication with the beneficiaries of the services. Better communication means service improvement, which leads to image improvement, which ultimately leads to an increase of the passengers' number.
- **12. Other**: There were many offers of telephone operators to choose from.

Implementation phase

- **10. Technological**: The recording of calls eliminates the subjectivism of information available only in writing after having had a telephone conversation. The more accurate the information, the easier the investigation of all complaints.

Operation phase

- **8. Organizational**: Task assignment is very well organised, so complaints are answered in much less time than the legal period.
- **10. Technological**: This service has been integrated within a module for the management of incidents, where complaints coming through various communication media are centralised and managed by means of a software application developed especially for the Public Transport Company.

D.2.3 Activities

Preparation phase

- **12. Other**: Negotiations were carried out with several telephone operators, and the goal of offering a free telephone service was reached in a relatively short time.

Implementation phase

- **5. Involvement, communication**: Stickers advertising the toll-free telephone service were placed inside all means of public transportation and on all ticket kiosks belonging to the public transport company. The service was also advertised in local newspapers.
- **8. Organizational**: The employees of the transport company who were going to answer the calls underwent a brief training.

Operation phase

- **5. Involvement, communication**: When the nature of a complaint requests that the claimant be contacted, or when a conclusion is reached after having conducted an investigation, the claimant is contacted as promptly as possible. Apart from the service improvement, the transport company aims also improved its image, as a side effect of satisfied beneficiaries.

D3 Participation of stakeholders

D3.1 Measure partners

- **Public Transport Company (Leading role)**
  - Responsible for establishing within the dispatch centre of a toll-free telephone service and for signing the contract with a specialised telephone company;
  - Responsible for communicating with citizens and for providing them accurate information about the public transport services;
  - Responsible for recording suggestions, opinions, complaints or other type of feedback from passengers and for making all necessary efforts to solve problems, when possible.

- **Telephone company (Principle participant)** – responsible for providing the toll-free telephone service and for keeping the statistics about number of users, call duration, etc.
- **Iasi Municipality (Occasional participant)** – responsible for the creation and distribution of promotional materials.
- **Technical University Iasi (Occasional participant)** – responsible for organizing surveys for the assessment of the measure.

D3.2 Stakeholders

- **Toll-free line users**: by using the toll-free telephone service they can participate actively in the improvement of public transport services through observations, suggestions or complaints.
- **Other citizens**: even the citizens who have not used this telephone service can benefit, indirectly, from this measure based on the feedback provided by those who have used it.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Not all public transport companies need such a service.** By having a free telephone line open to the public 24 hours a day has proven to be very helpful for the public transport company of Iasi, which is currently in a process of sustained technological development, which may not be needed in transport companies who have a tradition in meeting high standards of quality as per the services they offer.

D4.2 Recommendations: Learning from the experiences of the measure

- **Encouraging people to express their thoughts and experiences.** Should a public transport company want to encourage people to express their opinions on the services it offers and to announce any incidents or irregularities they notice, then introducing a free telephone line should be considered. The main goal for the transport operator in offering this facility is to improve the quality of the services it provides.
- **Importance of training.** A free telephone service encourages both well- and ill-intended people to use it. It would be advisable to have the persons who answer the telephone trained beforehand, so that they have some patterns to follow when answering questions, demands, complaints, praises, but also verbal abuses.
- **Importance of rapid reactions to complaints.** In order to maximize the efficiency of the service and to improve the image of the company, rapid reaction to complaints is needed.

ANNEX 1

Questionnaire – after situation

M. 38 - Toll-Free Line

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest graduated school _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket □ set of 10 trips □ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____
7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know
8. Has the public transport company introduced, as part of the CIVITAS project, a special toll-free telephone line by means of which people can obtain information or send suggestions / complaints about the public transport services in Iasi?
   □ yes □ no □ I don't know
9. Which of the following sources of information on public transport in Iasi do you know:
   □ kiosks of the public transport company □ employees of the public transport company
   □ posters in bus stops □ toll-free telephone line
   □ posters in the means of transport □ the website www.ratp-iasi.ro
   □ local newspapers □ website forum
10. Do you use the toll-free telephone line to get information about the services of the public transport company?
    □ yes □ no □ I don't know
11. Do you use the toll-free telephone line to send your suggestions / complaints about the services of the public transport company?
    □ yes □ no □ I don't know
12. What measures should take the public transport company to improve the toll-free telephone service?

13. How satisfied are you with the following aspects of the services offered by public transport company of Iasi?

	very satisfied	satisfied	almost satisfied	dissatisfied	very dissatisfied
the information provided to passengers using the toll-free telephone line					
the capacity of the employees of the transport company to answer the complaints, suggestions and questions of passengers who call using the toll-free service					
the public transport services provided by the public transport company in general					

14. Do you have any suggestions for improving the information system of the public transport company?

Thank you!

Executive summary

In order to meet the requirements of the European Union regarding the accessibility of public transport services for disabled people, the Municipality of Iasi, together with the public transport company of Iasi, decided to create proper conditions for both visually and physically impaired people to cross safely at least some of the intersections regulated by traffic lights, and to be able to travel with more public transport vehicles than before the implementation of the CIVITAS project.

The Municipality of Iasi, after discussing with The Association of Visually Impaired People and after signing a protocol with them, contracted through the ARCHIMEDES project a specialised company to install 40 audio warning devices at 16 controlled intersections. The Municipality also organised meetings with this association to decide which 50 stops were going to be modernised (access ramps and shelters) to grant persons with disabilities easy and safe access to public transport vehicles. The implementation phase was performed together with the public transport company.

Another task implemented as part of this measure was to equip 10 minibuses with hydraulic lifting ramps. The Municipality collaborated with the public transport company and with the contracted company to ensure compliance with all technical requirements.

The Technical University conducted surveys to assess the impact of the measure, with the following results:

- on assessing the awareness level, it became apparent that people's knowledge about the measure increased from 10% in 2009 to 45% in 2011, and to 53% in 2012.
- the acceptance level was evaluated on different levels:
    - from the perspective of the acceptance level among the respondents, the percentage of those who are not satisfied with the degree of accessibility provided by the public operator decreased significantly: from 99% in 2009 to 66% in 2012.
    - the acceptance of adapted public transport vehicles had an increased tendency among impaired people: from 29% in 2009, to 41% in 2012.
    - the percent of respondents who had difficulties in using public transport services decreased from 98% in 2009 to 92% in 2011 and to 88% in 2012.
- After assessing the perception of accessibility indicator, the surveys revealed that a high percentage of people with disabilities (over 70%) considered that the improvements achieved allow them to access public transport services more easily and facilitate their daily trips.

The following can be regarded as lessons that were learned:

- how shelters should be designed so as to accommodate also people with special needs, including people in wheelchairs;
- when designing shelters one should also consider the incidence of acts of vandalism in the respective city and choose suitable materials;
- the sound level of the audio warning devices has to be adapted according to the general surrounding noise conditions so as not to disturb people in residential buildings.

The results obtained after evaluation allow us to conclude that this measure has contributed to raising the degree of accessibility of public transport services for disabled people. It has contributed to raising the security level for visually-impaired people. It has also been noticed that, although the degree of accessibility and usage of public transport has increased, the accessibility to public transport stops still needs to be addressed (old buildings have to be adapted to the needs of disabled people – elevators should be installed and access ramps should be created).

IAS 48 - Provision for disabled persons in Iasi

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The objectives of the measure are:

(A) High level / longer term:

- To have public transport services that reach European level.

(B) Strategic level:

- To offer to impaired people the possibility to travel with more public transport vehicles.

(C) Measure level:

- To improve the quality of transport services.
- To install 40 audible warning equipments for visually impaired people at 16 main intersections regulated by traffic lights.
- To transform and equip 10 minibuses to enable access for physically disabled people.
- To reshape 50 stops so as to grant impaired people easy and safe access to public transport services.

A1.2 Target groups

This measure was conceived from the beginning for physically and visually disabled people, who were going to benefit from optimum conditions when crossing certain signal-controlled intersections and when using public means of transport and the corresponding infrastructure. In Iasi there are about 3.000 persons with physical and visual disabilities.

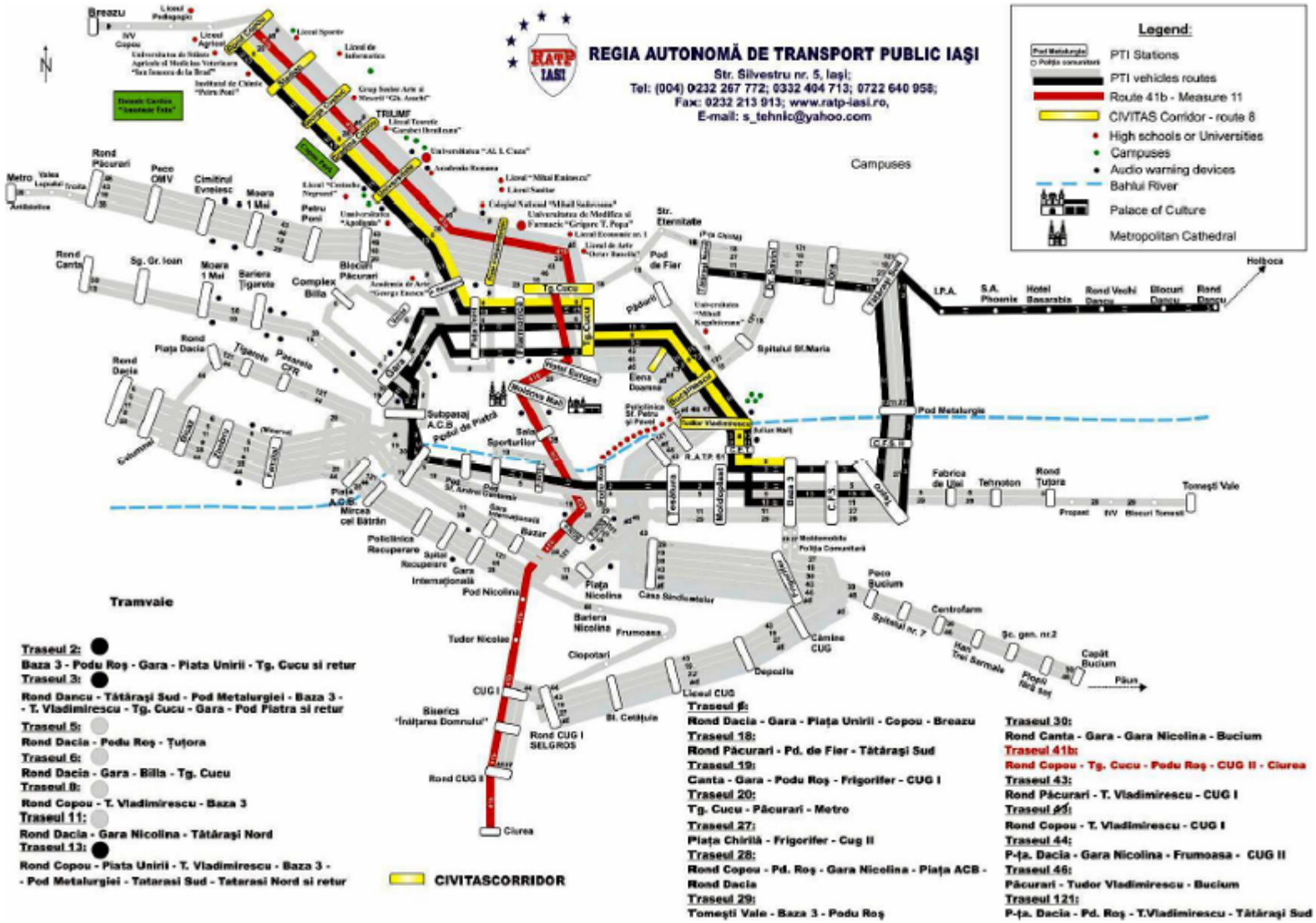
A2 Description

The measure comprised two actions aimed at improving the accessibility and safety of disabled people:

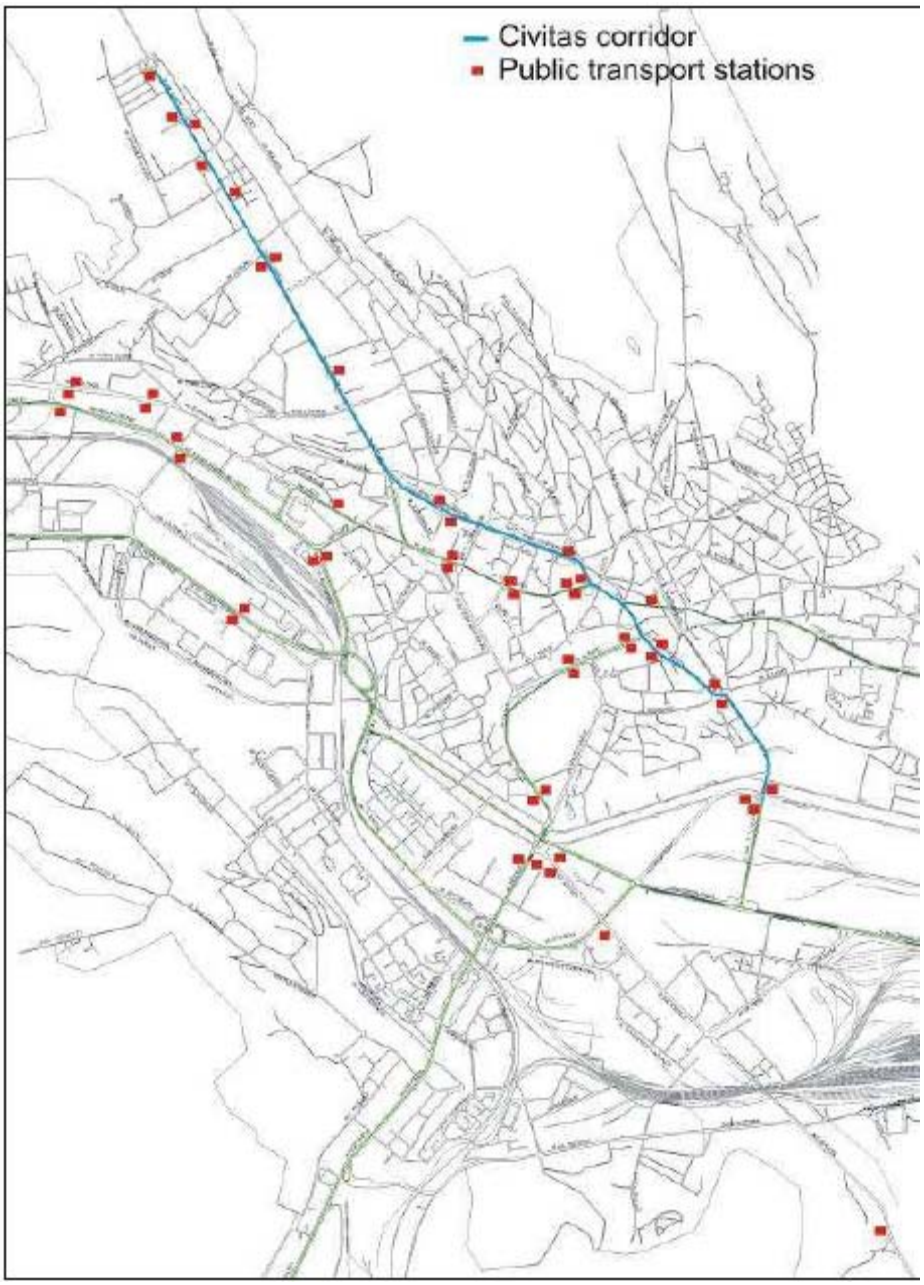
- audible warning devices were installed at 16 main intersections regulated by traffic lights (shown on Map 1 below) to help visually impaired people cross the street safely.

- ten minibuses were transformed in order to offer access to physically impaired people. Fifty stops (shown on Map 2 below) were transformed to grant accessibility to physically impaired people.

Map 1 - the locations where audio warning devices have been installed (black dots)



Map 2 - the locations of the stops that have been redesigned along the CIVITAS corridor



A3 Person in charge for evaluation of this measure

Names of persons	Homocianu Marius – implementation
	Cristi Simionescu – evaluation
Name of organization	Iasi, PTI
Direct telephone	+40742539009; +40332409861
e-mail	mariushomocianu421@hotmail.com; s_tehnic@yahoo.com

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – Only 50 low-floor buses were appropriate for transporting people with physical disabilities before the implementation of this measure. On the other hand, there were no controlled intersections to grant safety to visually impaired people while they crossed the streets.

- **Use of new technology/ITS** – In Iasi new technology has been used to transform 10 minibuses and to install devices at controlled intersections.

- **Targeting of specific user groups** – Visually and physically impaired people.

- **New policy instrument** – The implementation of this measure has supported the city of Iasi in its effort to make public transport more accessible.

B3 Situation before CIVITAS

There are about 3.000 persons with physical and visual disabilities in Iasi. There were shortcomings in providing visually and physically impaired people access to public transport, to public institutions, and in granting them safety while they moved through the city. There were only 50 low-floor buses which were appropriate for transporting people with physical disabilities. These buses ran on different lines along the CIVITAS corridor and outside its boundaries. The major problems were that sometimes buses were very crowded, the special seats for people with physical disabilities were taken by other passengers, and no public transport stops had special places for wheelchairs.

The Municipality of Iasi has set out a balanced transport strategy which aims at improving accessibility to everyday facilities for all people and to reduce road accidents.

B4 Actual implementation of the measure

The measure was implemented in the following stages:

a. **<u>Audio warning devices</u>**:
Stage 1: Discussions with people involved (*May-June 2009***) –** The Municipality of Iasi together with "The Association of Visually Impaired People Iasi-Vaslui" decided upon the locations where the audio warning devices were to be installed along the CIVITAS Corridor, as well in other locations.
Stage 2: Tender notice (*June 2009***)** – After the locations were established, the tender notice was published.
Stage 3: Signing of the contract (*August 2009***) –** After evaluation of offers a contract with the winner company was signed.
Stage 4: Implementation (*September 2009***)** – 40 audio warning devices were installed at 16 intersections stipulated in the contract (see Map 1 above and Annex 1).

b. **<u>Modernization of stops:</u>**
Stage 1: Decisions about the location (*April 2010*) – The Municipality of Iasi together with The Association of Physically Impaired People selected the stops on the CIVITAS Corridor, as well at other locations, that were to be transformed for disabled people. The decision was made based on consultations with disabled people, who indicated the stops they used most.

Stage 2: Publishing of the tender (*May 2010***)** – The tender notice was launched.
Stage 3: Signing of the contract (*August 2010***) –** After the offers were evaluated, a contract with the winner company was signed.
Stage 4: Implementation (*September 2010***)** – Transport stops were rebuilt so as to provide easy and safe access for people with disabilities (see Map 2 and Annex 3)

c. **Conversion of 10 minibuses:**
Stage 1: Publishing of the tender (*August 2010***)** – The tender notice was launched.
Stage 2: **Signing of the contract (***December 2010***)** – After the offers were evaluated, a contract with the winner company was signed.
Stage 3: Implementation (*January-February 2011***)** – 10 minibuses were transformed to enable access for physically disabled people.

Evaluation: (*Before - May 2009; After - June 2011 and February 2012*) - Questionnaires were filled in within face-to-face interviews for all the tasks. Moreover, the impaired people who used the converted minibuses and those who crossed the intersections equipped with audio warning devices were counted in June 2011 and February 2012.

Task 5.8: Audio Warning Devices

The Municipality of Iasi and The Association of Visually Impaired People Iasi-Vaslui decided together upon the 16 locations where the audio warning devices were to be installed along the CIVITAS Corridor, as well on other locations, according the following criteria:

- the intersections mostly used by visually impaired citizens;
- location of their Association;
- location of their workplaces;
- high density areas used by visually impaired people (see Map 1).

The Municipality of Iasi, in collaboration with a specialised company, mounted the audio warning devices for visually impaired people (40 units) at 16 main intersections regulated by traffic lights on the CIVITAS corridor (see Map 1). The precise locations where the devices have been installed are to be found in Annex 1.

The decision about the proper manner to install the devices was made on a case-by-case basis because every crossing was different and it was imperative to optimize the installation in order to maximize the success rate. The devices had to be protected from interferences with other devices, panels, mechanical obstructions, etc. The connections were made with anti-vandal cables, as the wires are under high voltage (230 V). The devices were connected to existing pedestrian traffic lights.

The private company was selected by a transparent public procurement tender, following the applicable legal provisions. The company provided and installed the audio warning devices. The requirements of the procedure included that the audio warning devices followed the international standards for traffic and noise safety (see Annex 3).

These devices were installed according to the specifications given by the Association of Visually Impaired People, and also according to the noise level registered during the day and during the night, so that people living in the surrounding area would not be disturbed. The audio warning devices were installed successfully from an operational perspective.

Fig. 1 Audio devices

The installation of audio warning devices was very well received by the beneficiaries, who agree that this measure has improved their access to the most frequented destinations, increasing their independence and safety while walking. Outcomes in terms of impact of the audio warning devices were determined within the project evaluation tasks.

The locations for mounting the devices were established in meetings with the association for the visually impaired people, which were attended by 3 representatives of the Municipality of Iasi, 3 representatives of the Iasi ARCHIMEDES team and 5 representatives of the Visually People Association. After implementation, a public campaign informed by radio and TV about the devices, their locations and their function.

The reactions of the mass media (written press, radio and TV) and of the Visually Impaired People Association were positive, most of them considering that it is necessary to extend this activity to the entire city. Some reactions in the media can be seen in Annex 2.

Task 5.9 : Fully accessible public transport- <u>Conversion of 10 minibuses</u>

The conversion of 10 minibuses adds to the measures already implemented for better and cleaner urban transport services by providing safety to disabled people as vulnerable category of passengers, and by increasing the number of public means of transport accessible to all citizens.

The conversion of the 10 minibuses consisted in mounting at the back of the vehicles an electro-hydraulic lifting platform to be used exclusively by persons in wheelchairs.
A full technical specification is presented in Annex 4.


Fig. 2 and 3 Electro-hydraulic lifting platform

The Municipality of Iasi collaborated with a specialised private company, which installed the equipment on the minibuses. This company was selected by a transparent public procurement tender following the applicable legal provisions. The requirements of this procedure included that the equipment followed the corresponding international standards.

Task 5.9 : Fully accessible public transport _ Modernization of PT stops

The Municipality of Iasi had to decide first upon the locations where the stops for disabled people were to be installed on the CIVITAS Corridor (see Map 2).

An important factor in choosing the stops in which to install the street furniture was the area needed for this type of construction and the impact it would have on the environment in its proximity. The new shelters are placed along the CIVITAS corridor and in the neighbouring areas, where high traffic levels are recorded and where disabled people indicated they should be mounted~~,~~

The Municipality of Iasi together with The Association of Physically Impaired People Iasi decided upon the stops to be modernised along the CIVITAS Corridor, as well at other locations, according to the following criteria:

- · the PT stops mostly used by persons with physical disabilities;
- · location of their Association,
- · location of their workplaces;
- · high density areas used by persons with physical disabilities.

The technical elements of the stops are:

1. Resistance structure
2. Roof
3. Special handrails for disabled persons
4. Side walls
5. Junction box and electrical installation

A full technical specification is presented in Annex 5.

Fig. 4 Modern shelter installed at one of the 50 locations

Fig. 5 Modern shelter installed at one of the 50 locations

In Annex 6 there is a list with the locations of the modernised stops.

The Municipality of Iasi collaborated with a specialised private company, which installed the street furniture in stops. This company was selected by a transparent public procurement tender following

the applicable legal provisions. The requirements of this procedure included that the equipment followed the corresponding international standards.

During the implementation of the measure various local media presented news about the task based on press releases issued by the Municipality of Iasi. A summary is included in Annex 2.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure B&H 72 (PT Information for visually impaired people)** – The implementation of this measure has improved the accessibility to public transport for people with disabilities.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

This measure has a direct impact on disabled people:

- it granted them accessibility to a larger number of public means of transport once the 10 minibuses have been adapted to their needs;
- it created a safer environment for visually impaired people, who can now safely cross part of the intersections regulated by traffic lights thanks to the audible warning devices.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ECONOMY					
2b			**Capital Costs**	**Capital costs**	Total costs for implementing the measure	**euro**
2c			**Maintenance costs**	**Maintenance costs**	Total maintenance costs	**euro**
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
15		**Accessibility**	Spatial Accessibility	Perception of accessibility	Survey	Index (%)
	NEW			Users	Number of users	Counting

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2b	Capital costs	21,400 Euro (audio warning devices) + 10 minibuses transformed + 50 shelters built	resulted from the financial offer of the supply companies	Once, when contracts were signed.
2c	Maintenance costs	As low as possible	resulted from the financial data analysis regarding the maintenance operations	-
13	Awareness level	Increased level of awareness	The interviews for the assessment of indicators were carried out by students at the headquarters of The Association of Physically Impaired People and at The Association for Visually Impaired People. The questionnaires included questions for both physically and visually impaired people. Two teams of students from the Technical University of Iasi received a set of 50 questionnaires each, for both groups of physically and of visually impaired people*. **May 2009.** The volontary respondents were asked in face to face interviews in the headquarters of their Association if they had heard about the CIVITAS project and about the facilities to be implemented that would enable access to impaired people. (awareness level). In order to evaluate the acceptance indicator, people were asked if public transport services were accessible to all citizens, including those with disabilities; if public transport vehicles were adapted to facilitate the access for impaired people; whether more public means of transport and special shelters adapted to the needs of disabled people were needed, etc. The "perception of accessibility" indicator focused on the access to public transport services provided: minibuses were to be equipped with hydraulic lifting ramps, access ramps and special shelters were to be installed in stops, and audio warning devices were to be mounted in intersections. **June 2011 and February 2012.** Another set of 100 questionnaires was used for face-to-face interviews in both instances. The surveys were conducted in the same place as in 2009, but with different respondents. The questions for assessing the awareness level indicator and perception of accessibility indicator remained the same, but they were adapted to the stage of implementation. The questions for evaluating the acceptance level remained the same.	Before – May 2009 After - June 2011 and February 2012
14	Acceptance level	Increased level of acceptance		
15	Perception of accessibility	A higher level of "accessibility perception" index on a five-point scale		
NEW	Users	Increased	The number of physically disabled people who use modified minibuses and of visually impaired people who cross controlled intersections equipped with audio warning devices was counted.	June 2011 and February 2012

* The questionnaire is to be found in Annex 7.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	13, 14, 15	M 9	Iasi, PTI
Collection of after data	All indicators	M34, M42	Iasi, PTI
D12.2 Baseline and first results from data collection	All indicators	Month 38	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

Until 2008, the access to public transport services and also to public institutions was sometimes difficult for visually and physically impaired people. There were only 50 low-floor buses running within and outside the boundaries of the CIVITAS corridor which granted access to impaired people. Another problem was the lack of adapted traffic lights in the areas frequently used by persons with special needs, resulting in a high risk of traffic accidents.
The data collection method for the evaluation of the measure is as follows:

- The economic indicators have been obtained by analysing internal data of the public transport company and / or of the Iasi Municipality of Iasi.

- The new indicator, called "users", was obtained by counting the number of physically disabled people who use modified minibuses and of visually impaired people who cross controlled intersections equipped with audio warning devices was counted

- In order to assess the awareness level, the acceptance level and the perception of accessibility surveys were conducted at the headquarters of The Association of Physically Impaired People and at The Association for Visually Impaired People.

- The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

- The representatives of the three institutions decided that the survey was to be conducted on the same sample size (50 + 50 people) after the measure has been implemented, thus making it possible to compare the results of the “before” and of the two “after” situations. For each of the two associations, two interviewers questioned face-to-face ten people a day for five days. The questionnaires included questions for both physically and visually impaired people. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews. The groups of students who carried out the interviews in the three periods differed one from another each year.

No indicators regarding the safety of disabled people when moving outdoors were taken into account during the evaluation, because no records of traffic accidents where such people were involved were found at local level. This may be explained by the lack or very small number of such accidents, which may due to the reduced mobility of disabled people and to the fact that they usually are accompanied (special facilities are granted to attendants of impaired people).

C1.3 Methods for Business as Usual scenario

In respect to the accessibility of physically impaired people to public transport services, there were only 50 buses fitted with an access ramp out of a total of 80 buses and 50 minibuses belonging to the public transport company of Iasi, which meant restricted access for disabled people to public transport services.

Previously there were no audible devices to inform visually disabled persons about when they can cross intersections safely.

C2 Measure results

C2.1 Economy

Table C2.1.1 – Capital costs

Indicator		-Euro- without VAT
2b. Capital costs	Audio warning devices	20,444 €
	Modernised stops	173,333 €
	Transformation of minibuses	121,638 €

*The rate exchange is 1 Euro = 4.5 Lei

Table C2.1.2 – Maintenance costs

Indicator		-Euro- without VAT
2c Maintenance costs		746 Euro/month

*The rate exchange is 1 Euro = 4.5 Lei

We have split maintenance costs into two categories:
a. Maintenance costs for the hydraulic lifting ramp

Maintenance operations consist of the inspection of the hydraulic lifting ramp. This inspection is performed by a professional mechanic, who must do a leakage test, has to check the level of the hydraulic oil, and to make sure that the whole equipment runs properly.

It has been determined that such an inspection lasts 1 hour / minibus and that it has to be made once a month.The salary of a mechanic for one hour is 3.6 euro (3.6 Euro/minibus/hour x 10 minibuses = 36 Euro / month).

b. Maintenance costs for the modern shelters

Most of the shelters were vandalised and, due to the fact that they are partially made of glass, the panels were broken. A commission was created for assessing damage.

Time period	October 2010 – May 2011	June 2011 – January 2012
No. of shelters repaired	35	45
Price	3700 Euro	6667 Euro
Total	10,367 Euro	

The 50 shelters were installed in October 2010, and in May 2011 the first evaluation of the damaged shelters was made. Consequently 35 shelters were repaired, and the costs of the spare parts amounted to 3700 Euro.

In January 2012 a second damage evaluation was carried out and 45 shelters were repaired. The spare parts cost 6667 Euro. The total cost of the spare parts was 10,367 Euro.

The reason why the parts for 45 shelters cost almost double than those for 35 shelters is that the number of broken glass panels may differ from one shelter to another.Two workers replaced the glass panels of each

shelter, and the average work time at one shelter was of 1 hour.The manpower costs for replacing all broken glasses of one shelter are as follows:
- the salary of one worker is 1.73 Euro/hour
- 1 hour * 2 workers * 1.73 Euro/hour/worker = 3.46 Euro

The manpower costs for all the shelters that have been repaired are:
3.46 Euro * 80 shelters = 277 Euro within 15 months (October 2010 – December 2011).

The average costs for the maintenance of the ~~50~~ shelters are:
(10,367 Euro + 277 Euro) / 15 months = 710 Euro/month

The maintenance costs for the whole measure are:
36 Euro + 710 Euro = 746 Euro / month.

C2.2 Society

The interviews (before / after) were carried out always in the same place, at the headquarters of The Association of Physically Impaired People (50 interviewees) and at The Association for Visually Impaired People (50 interviewees). A characterisation of the respondents is provided in the tables below (Fig. 6 and Fig. 7).

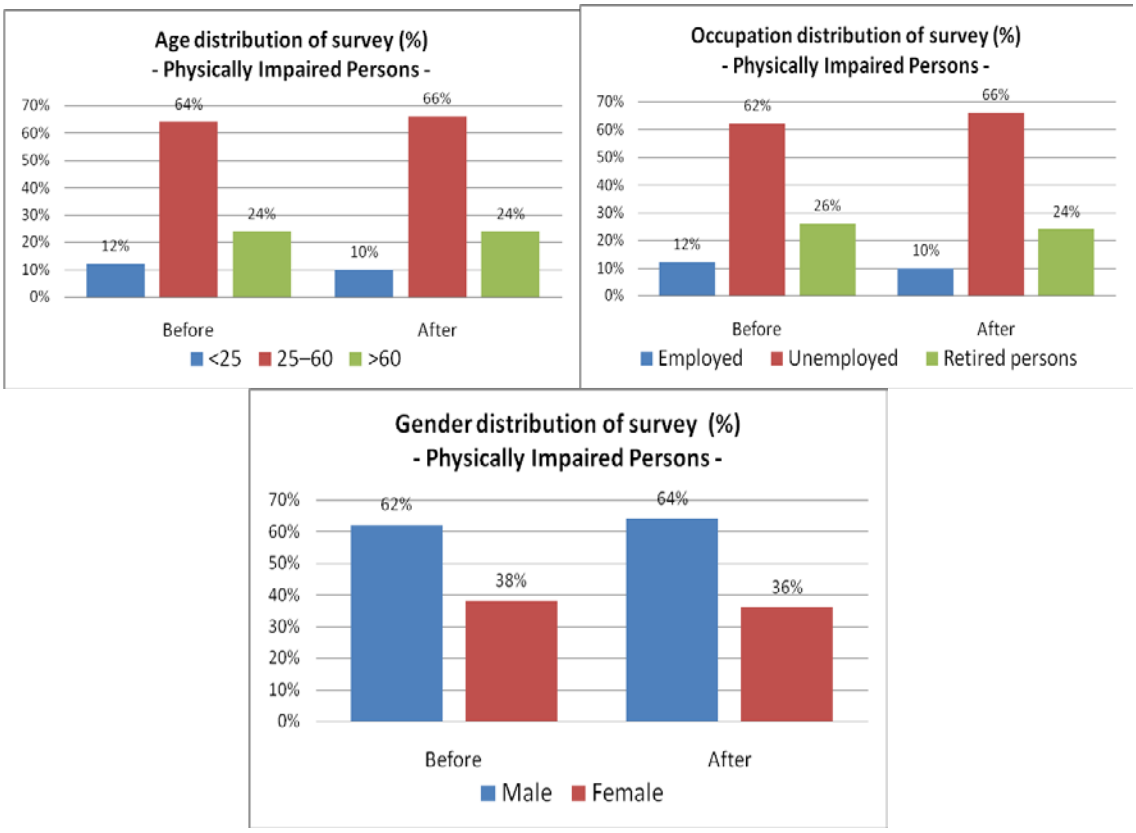


Fig. 6 Characterisation of the respondents – physically impaired people

On analysing the characteristics of the respondents (Fig. 6), we notice the following evolutions in the "before" and "after" situations:

- most of the interviewees are within the 25 to 60 year-old bracket (64% and 66%, respectively);
- most of the interviewees are male in both situation (62% and 66%, respectively);
- most of the interviewees are unemployed (62% and 64%, respectively), and around 10% are employed.

Disabled people are usually integrated in programs of social security supported by state institutions or NGOs.

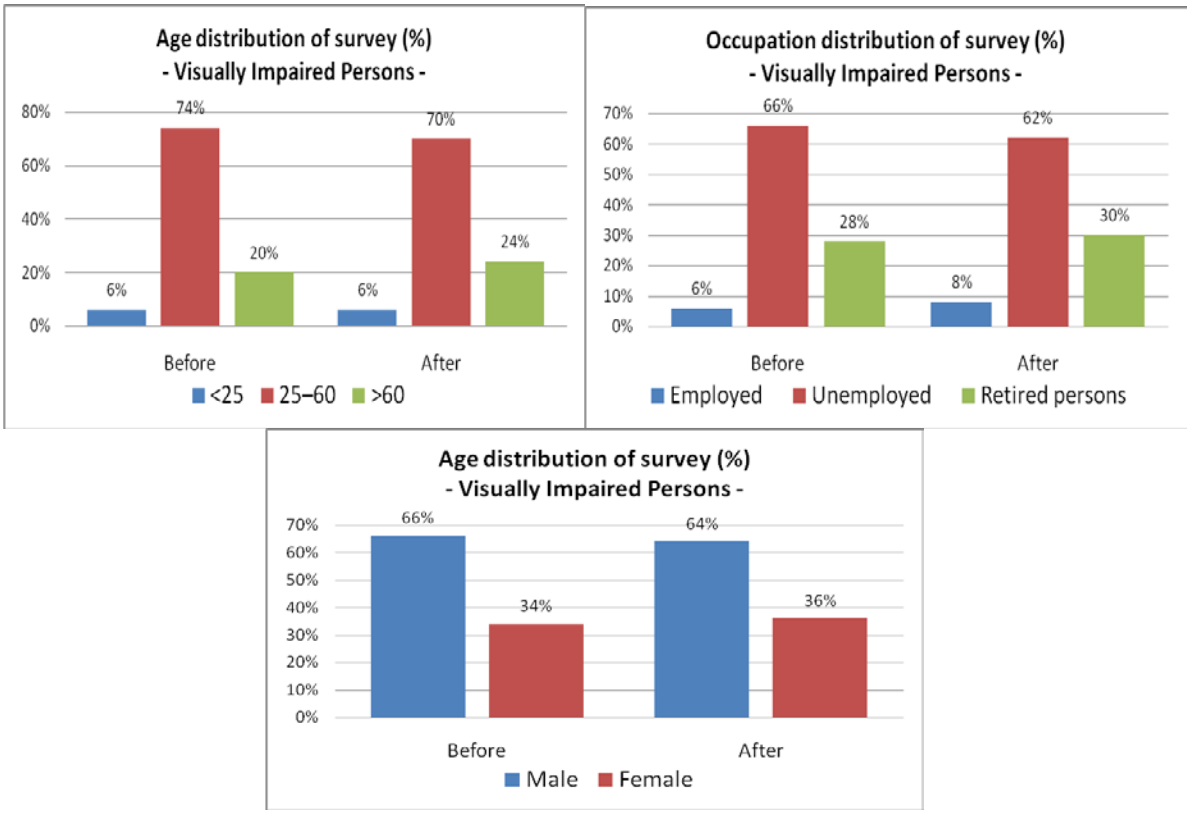


Fig. 7 Characterisation of the respondents – visually impaired people

On analysing the characteristics of the respondents (Fig. 7), we notice the following evolutions in the "before" and "after" situations:

- most of the interviewees are within the 25 to 60 year-old bracket (74% and 70%, respectively);
- most of the interviewees are male in both situations (66% and 62%, respectively);
- most of the respondents are unemployed (66% and 64%, respectively), and around 6% are employed;

Disabled people are usually integrated in programs of social security supported by state institutions or NGOs.

Table C2.2.1: Awareness level

Indicator		Before (2009)	After (2011)	After (2012)
13. Awareness level (%)	1. Yes	10%	45%	53%
	2. No	1%	2%	1%
	3. I don't know	89%	53%	46%

Regarding the awareness core indicator, interviewed people were asked if they had heard about the CIVITAS project and if they knew that impaired people benefited from a series of facilities during their daily trips thanks to this project.

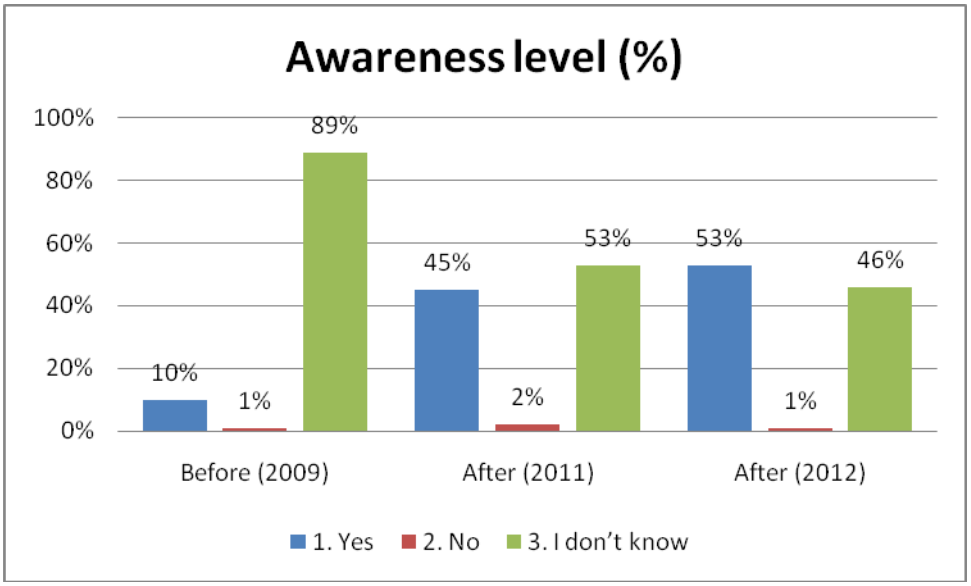


Fig. 8 Awareness level

Fig. 8 shows that the percentage of respondents who had heard about the tasks implemented through this measure increased from 10% in 2009 to 45% in 2011 and to 53% in 2012. The number of those who had not heard about the measure decreased from 89% in 2009 to 53% in 2011 and to 46% in 2012.

Table C2.2.2: Acceptance level

Indicator		Before (2009)					After (2011)					After (2012)				
14. Acceptance level (%)	Question	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
	1. total disagreement	99	0	0	0	0	70	0	0	0	0	66	0	0	0	0
	2.	0	0	0	0	0	19	0	0	0	0	24	1	1	0	0
	3.	1	0	71	0	0	11	0	60	0	0	8	3	58	0	0
	4.	0	2	18	0	0	0	8	28	0	0	3	8	28	0	0
	5. total agreement	0	98	11	100	100	0	92	12	100	100	0	88	13	100	100

For the assessment of the acceptance core indicator, the respondents were asked the following questions:
a. Are the public transport services accessible to all citizens, including people with disabilities?
b. Do people with disabilities experience major problems in using the public transport system?
c. Does the public transport company have public transport vehicles adapted to the needs of people with disabilities?
d. Should the public transport company increase the number of vehicles fitted with access ramps in order to facilitate the access for people with disabilities?
e. Should the public transport company increase the number of shelters modified so as to facilitate the access for people with disabilities?

On analysing the results after having interviewed disabled people, we considered that a graphical representation was relevant only for questions a (Fig. 9), b (Fig. 10), and c (Fig. 11), because at questions d and e all respondents answered that they agreed that there should be more public means of transport adapted to their needs and more modernised stops to facilitate access to public transport.

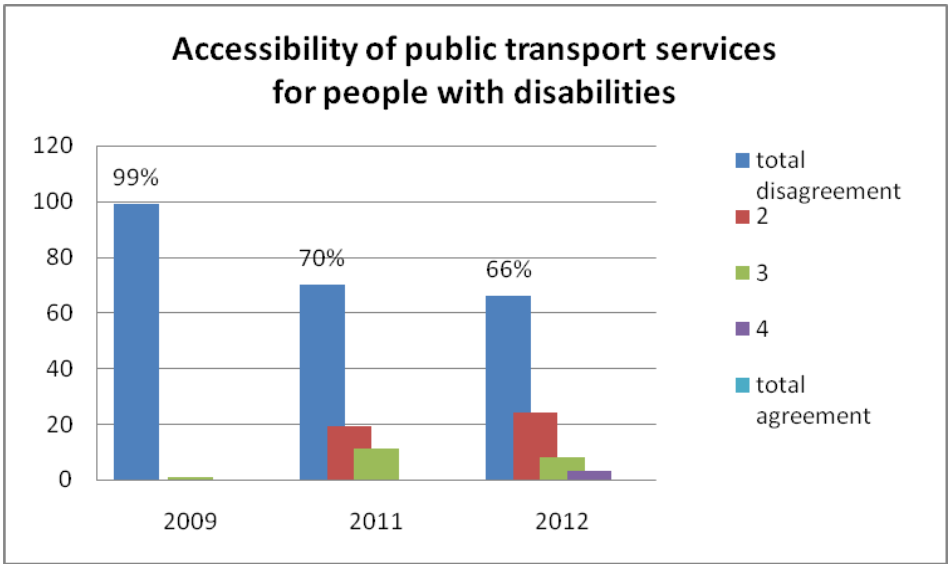


Fig. 9 Acceptance level

Fig. 9 reveals that after the implementation of the measure the percentage of persons with disabilities that were dissatisfied of the level of accessibility provided by the public transport services decreased from 99% in 2009 to 70% in 2011 and to 66% in 2012.

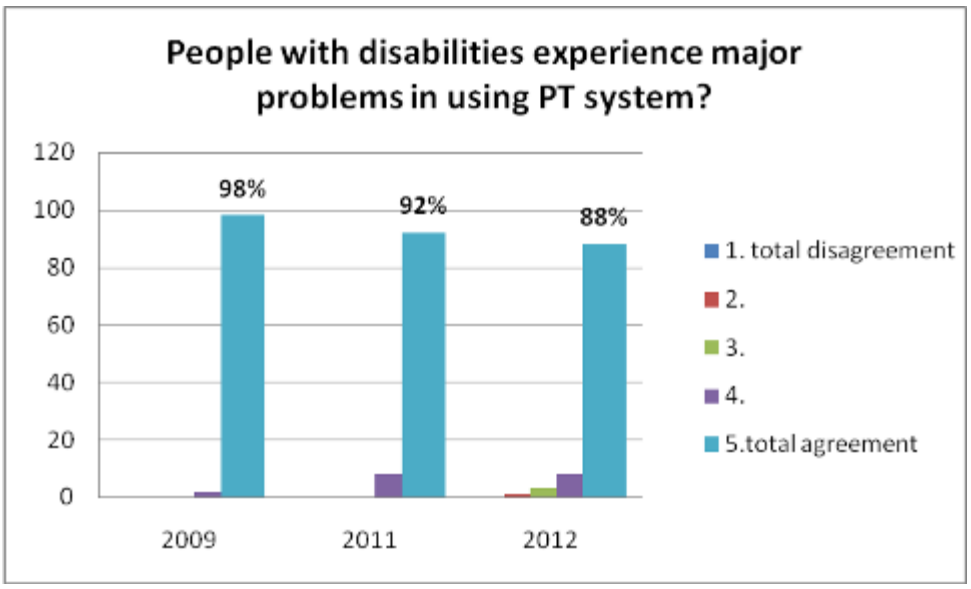


Fig. 10 Acceptance level

The analysis of the answers to the question whether disabled people were facing major problems in using public transport showed a decrease of the number of respondents who agreed to this statement – from 98% in 2009 to 92% in 2011 and to 88% in 2012 (Fig. 10). This means that the tasks implemented as part of this measure have led to a decrease of access-related problems to public transport, at least from the point of view of the respondents.

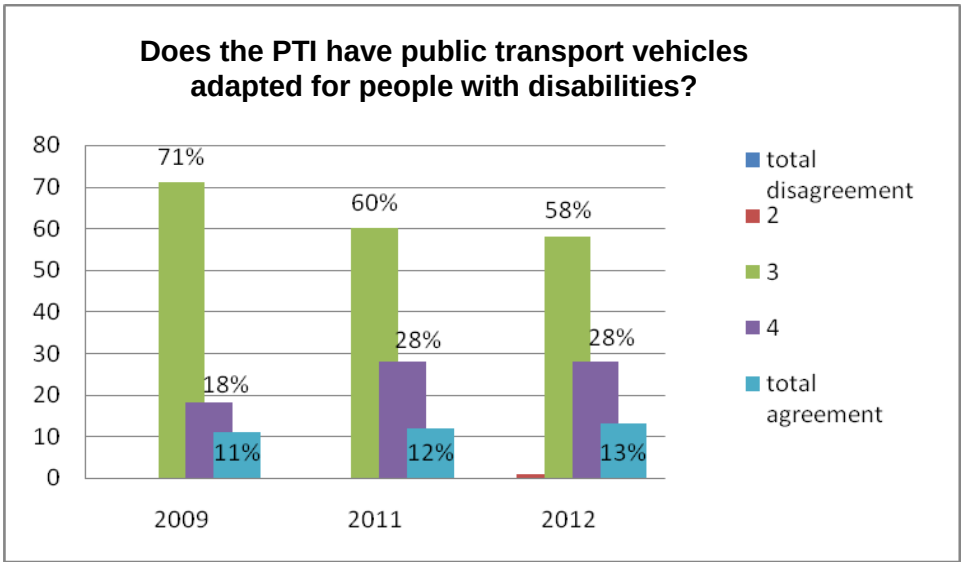


Fig. 11 Acceptance level

The percentage of impaired people neither agreeing nor disagreeing with the question whether the public transport company has got vehicles adapted for their needs (Fig. 11) decreased from 71%, before the implementation phase to 60% in 2011 and to 58% in 2012. On the other hand, the percentage of respondents who answered positively to this question (points 4 and 5) increased from 29% in 2009 to 41% in 2012.

On analyzing the answers to questions d and e, we noticed that people with disabilities need for their daily trips more public means of transport equipped with access ramps and more bus shelters modified according to their needs.

Table C2.2.3: Perception of accessibility indicator

Indicator		Before (2009)					After (2011)					After (2012)				
	question	a	b	c	d	Av	a	b	c	d	Av	a	b	c	d	Av
15. Perception of accessibility (%)	1. total disagreement	0	0	0	0	0%	0	0	0	0	0%	0	0	0	0	0%
	2.	0	0	0	0	0%	0	0	0	0	0%	1	0	2	1	1%
	3.	5	9	10	12	9%	2	8	8	11	7%	3	7	7	10	7%
	4.	5	0	17	64	22%	3	2	16	60	20%	2	3	15	65	21%
	5.total agreement	90	91	73	24	70%	95	90	76	29	73%	94	90	76	24	71%

For the assessment of the "perception of accessibility" core indicator, the respondents were asked the following questions:
a. Do the minibuses of the public transport company equipped with a hydraulic lifting ramp provide easy access to public transport services for persons with disabilities?
b. Do the low-floor buses of the public transport company equipped with an access ramp provide easy access to public transport services for persons with disabilities?
c. Do the stops of the public transport company equipped with access ramps and special shelters provide easy access to public transport services for persons with disabilities?
d. Do the audio warning devices installed at controlled intersections facilitate the daily movement of persons with disabilities?
e. Does the city of Iasi offer proper conditions to persons with disabilities for their daily trips?

Only questions from a to d were represented graphically and their arithmetic mean was calculated (Fig. 12), since answers to question e did not have any significant evolution in the two periods after implementation (2011 and 2012) compared to the period before implementation (2009).

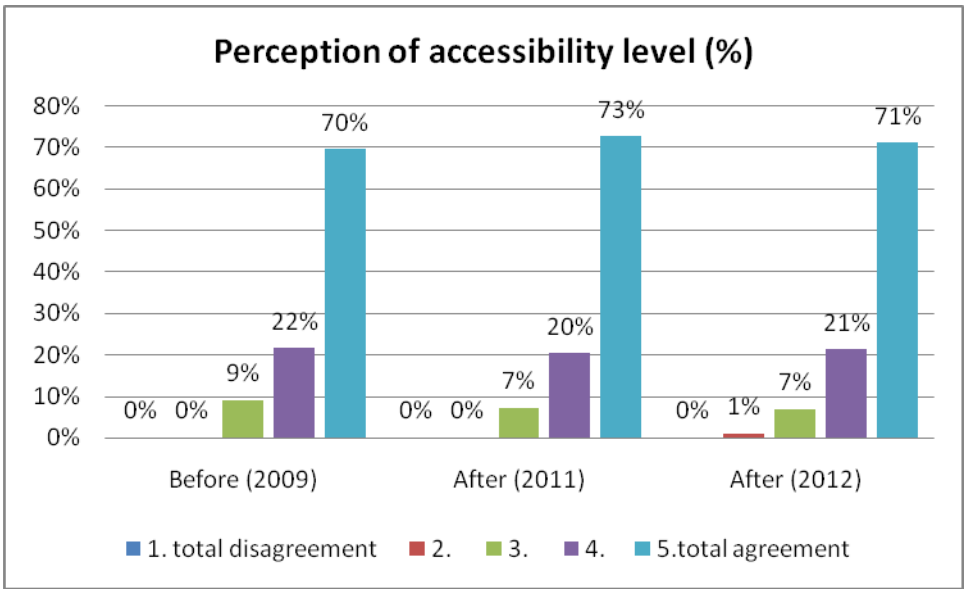


Fig. 12 Perception of accessibility

The analysis of the perception of accessibility indicator (Fig. 12) reveals that a very high percentage of people with disabilities – over 70% – think that the tasks implemented allow them to access public transport services more easily.

Table C2.3 Users

Indicator	After	
	June 2011	February 2012
Persons that use the hydraulic lifting ramp of the minibuses	10 users per month	9 users per month
Impaired people who cross intersections equipped with audio warning devices	10 users per day	12 users per day

Unfortunately there is no data available for the period before implementation on the number of disabled people using public means of transport and crossing signal-controlled intersections, respectively, per unit of time.

In June 2011 and in February 2012 the drivers of the minibuses equipped with hydraulic lifting ramps were instructed to announce at the end of each day the number of physically disabled persons who used the lifting ramp. Thus a total of 10 people were counted in June 2011, and 9 in February 2012.

An explanation for the low number of people that use such minibuses is that the infrastructure between their home and the closest stop, and between the destination stop and their final point of interest is still inappropriate.

In order to count the number of visually impaired people crossing the intersections equipped with audio warning devices, two inspectors monitored two intersections in the interval 8 a.m.-2 p.m. and other two in

the interval 2 p.m.-8 p.m. This was repeated during 8 consecutive days, so that all 16 intersections were covered. The results revealed that there were intersections that no visually-impaired people crossed during one whole day, and that the maximum number of visually-impaired people who crossed such an intersection in a single day was 3. The result is that, on average, 10 visually-impaired people cross the intersections equipped with audio-warning devices each day.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	to install 40 audible warning equipments for visually impaired people at 16 main intersections regulated by traffic lights	**
2	to transform and equip 10 minibuses to enable access for physically disabled people	**
3	to reshape 50 stops so as to grant disabled people easy and safe access to public transport services	**
NA = Not Assessed O = Not Achieved * = Substantially achieved (at least 50%) ** = Achieved in full *** = Exceeded		

C4 Upscaling of results

Depending on the needs of visually disabled people, audio warning devices can be installed in many other intersections of the city.

Modern shelters adapted to people with special needs are planned to be installed throughout the entire city.

Should requests to increase the number of minibuses that provide easy access for persons with disabilities arise, this measure can be upscaled to the rest of the minibuses of the public transport company.

C5 Appraisal of evaluation results

We have encountered the following difficulties in evaluating this measure:

- At the beginning of the project, the plan for evaluating this measure was based on the assumption that the associations of disabled people had a database of the persons with special needs, which would have allowed us to pick respondents belonging to a variety of groups (at least from the point of view of their age and occupation). When we decided to carry out the interviews, we learnt that the two associations were not so well organised as to offer us what we had expected. Therefore, we contacted different state institutions to get the data we needed. Then we went back to the associations and we fixed the dates when the interviews could be performed, correlating the days when the students were able to conduct the interviews with the days when the associations were open. When the students handed in the questionnaires, we were able to see the impact the interviews had on them; they had obviously realised the difficulties disabled persons are confronted with daily when having to transfer from one location to another within the city.

- A traffic inspector had to monitor each intersection with audio warning devices for 6 hours continuously and count disabled people who crossed it.

- We had to estimate the average manpower cost per hour in order to calculate the maintenance costs for checking the hydraulic ramps mounted in minibuses and for repair the damaged shelters.

C6 Summary of evaluation results

After assessing the results of indicators data collection, we can summarize that:

- The awareness level of the people that have heard about the implementation of this measure increased from 10% in 2009, to 45% in 2011 and 53% in 2012.

- On evaluating the acceptance level indicator we noticed that the percentage of people with disabilities that were initially undecided with respect to whether any means of transport adapted for their access existed dropped after the measure was implemented from 71% in 2009 to 60% in 2011, and to 58% in 2012. On the other hand, the percentage of those who answered positively (points 4 and 5) increased from 29% in 2009, to 41% in 2012. The percent of those who answered that they encountered major difficulties in using public means of transport decreased from 98% in 2009 to 92% in 2011 and to 88% in 2012. When asked, all respondents answered that they needed for their daily trips more public transport vehicles equipped with an access ramp and more stops modified to allow easy access.

- Regarding the perception of accessibility indicator, we saw that a very high percentage of people with disabilities (over 70%) consider that the implemented tasks allow them to access more easily public transport services and facilitate their daily movement.

- The number of users remained almost the same, with only slight variations the reason of which we have already explained.

C7 Future activities relating to the measure

After the project has ended, the Municipality of Iasi and the public transport company will ensure the necessary maintenance works to preserve in proper conditions the audio warning devices, the hydraulic ramps of the minibuses, and the stops that facilitate the access of people with disabilities.

D Process Evaluation Findings

A non-focused measure

D1 Deviation from the original plan

There were no negative deviations from the original plan.

- Because the complexity of some intersections, and based on the Protocol signed with The Association of Visually Impaired People, it was necessary to install more than two audio warning devices per intersection (as it had been initially predicted) in the locations specified within the Protocol, but the total number of audio warning devices according to the DoW was kept.

- The Municipality of Iasi had initially thought to modernise 40 public transport stops. We then considered linking this measure to old measure 13 – Improved PT Information, through which 50 real-time information panels were to be installed in 50 public transport stops. This is the reason for which a total of 50 stops, instead of 40, were modernised to allow easy access for people with disabilities.

D2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **4. Problem related**: Designing a model for the shelters for stops to ensure accessibility for all categories of people was not straightforward.

Implementation phase

- **10. Technology**: An authorised firm to offer a suitable solution for transforming 10 minibuses of the public transport company so as to adapt them for wheelchair access had to be found and then the steps for having the transformed minibuses authorised for public transport had to be taken.

Operation phase

- **10. Technology**: Surveys have shown that people with special needs appreciate having public means of transport adapted to their needs, however, the non-suitable infrastructure between their home and the closest stop, and between the destination stop and their final point of interest, respectively, still hinders them to move free from barriers.
- **3. Cultural**: Shelters are sometimes vandalised.

D.2.2 Drivers

Preparation, implementation and operation phase

- **Need for integration**. The drivers are the same in all three phases: the need of disabled people for integration, for becoming more independent by being able to move more freely from one place to another. Gaining visibility to the society translates into more awareness of their needs and into acting so as to improve their quality of life.

D.2.3 Activities

Preparation phase

- **4. Problem related**: Several models for shelters were created, the shortcomings and the advantages of each were analysed, and in the end one model was chosen.

Implementation phase

- **8. Organizational**: The drivers of the public transport companies were trained to handle the lifting platforms and to behave appropriately towards their potential users, and the technicians were instructed on maintaining them.

Operation phase

- **9. Financial**: Extra funds have been invested in repairing vandalised shelters.

D3 Participation

D3.1 Measure partners

- **Municipality of Iasi (Leading Role)**

- in charge with preparing the documentation, the tender and for signing the contract for audible warning devices.
- in charge with organising the tender procedures and for signing the contract for the transformation of minibuses.
- in charge with organising meetings and signing a Protocol with The Association of Visually Impaired People Iasi-Vaslui regarding the 16 locations where audible warning devices were installed.
- the Municipality of Iasi together with The Association of Persons with physical disabilities decided upon the locations where public stops should be modernised along the CIVITAS Corridor, as well as in other locations.
- collaboration with the public transport company and with a specialised private company during the minibuses' transformation.
- responsible for purchasing shelters to equip 50 public transport stops.

- **The public transport company (Principle participant)**

- in charge with preparing the documentation for equipping 10 minibuses with hydraulic lifting ramps.
- participating at meetings held with the Municipality of Iasi and with a specialised private company during the transformation of the minibuses .
- in charge with modernizing 50 stops to provide easy access for persons with disabilities.
- in charge with collecting all indicators to assess the impact of the measure.

- **Private companies that supply necessary equipments (Principle participant)** – one company supplied and installed audio warning devices and another one transformed 10 minibuses. Both are responsible for maintenance operations within the warranty period.
- **Technical University Iasi (Occasional participant)** – participated in organizing surveys and face-to-face interviews for the assessment of the measure.
- **The Associations for disabled persons (Occasional participant)** – both associations were involved in the measure's preparation phase.

D3.2 Stakeholders

- **Persons with disabilities**: either living in Iasi or coming to city as tourists, people with disabilities are directly affected by the implementation of the measure.
- **The Associations for disabled persons and other NGOs**: special NGOs together with the above-mentioned Associations can lobby in favor of the creation/purchasing of proper

infrastructure and/or public transport vehicles for allowing people with disabilities to move easily within the city.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Replicability**. All measure's tasks can be replicated successfully in other cities. While audio warning devices can and should be installed in controlled intersections of other cities, and public transport stops should grant easy access to people with disabilities, minibuses (if any available) do not necessarily need to be equipped with hydraulic lifting ramps; if all or at least most of the public transport vehicles provide accessibility for disabled people there is obviously no need to add lifting platforms to vehicles; it is enough to intercalate one non-accessible vehicle between two accessible ones.

D4.2 Recommendations: Learning from the experiences of the measure

- **Space for wheelchair.** Designing shelters in stops so as to accommodate also people with special needs, including people in wheelchairs, is important for all public transport systems.

- A**nti-vandalism materials**. When designing shelters one should also consider the incidence of acts of vandalism in the city and choose suitable materials.

- **Sound level of audio warning devices**. Installing audio warning devices at pedestrian traffic lights is always of great help for visually impaired people. However, the sound level has to be adapted according to the general surrounding noise conditions so as not to disturb people in residential buildings.

ANNEX 1

Locations of the audio warning devices:

1. Bariera Tigarete - **4 pcs** (1 crossing str. Strapungere Silvestru; 1 crossing Moara de Foc)
2. Gara mare - **6 pcs** (1 crossing str. Garii; 1 crossing str. Silvestru; 1 crossing str. Stapungerii Silvestru)
3. Moara de Foc (Canta) - **2 pcs** (1 crossing str. Moara de Foc; 1 crossing str. Canta)
4. Munca Invalizilor - **2 pcs** (1 crossing sos. Pacurari - aleea Cimitir Evreiesc)
5. Podu Ros - **2 pcs** (1 crossing str. Nicolina – post office)
6. Minerva - **2 pcs** (1 crossing bdul. Al. Cel Bun)
7. Recuperare - **2 pcs** (1 crossing str. Pantelimon Halipa)
8. Pacurari-Moara de Foc - **4 pcs** (1 crossing str. Pacurari; 1 crossing sos. Pacurari-Moara 1 Mai)
9. Codrescu - **2 pcs** (1 crossing bdul. Carol I)
10. Spiridon - **2 pcs** (1 crossing bdul Independentei)
11. Mitropolie - **2 pcs** (1 crossing bdul St.Cel Mare – str. Colonel Langa)
12. Tudor Vladimirescu– **2 pcs** (1 crossing bdul Tudor Vladimirescu – Iulius Mall – Facultatea de Chimie)
13. Univ Al. I. Cuza – **2 pcs** (1 crossing bdul Carol I)
14. Traversare N Iorga– **2 pcs** (Casa Sindicatelor-Cotnari)
15. Str Palat– **2 pcs** (Gh Asachi school - Palat)
16. Str Strapungerea Silvestru – **2 pcs.**

See Map 1 for location within the city of Iasi.

ANNEX 2

Some examples of reaction to implementation of the measure in written press

http://www.iasiplus.ro/news/4/17357/Semafoare+cu+semnale+acustice+pentru+nevazatori.html

Fig. A1 This online newspaper announced the intention of the Municipality to install audio warning devices

http://www.7est.ro/stiri//esential/8308-municipalitatea-a-inceput-montarea-semafoarelorpentru-nevazatori-foto

Fig. A2 This online newspaper announced that audio warning devices had begun to be installed

http://www.evenimentul.ro/articol/statii-moderne-pe-coridorul-civitas.html

evenimentul
REGIONAL AL MOLDOVEI
ediția online de miercuri, 14 iulie 2010
Iași, Bacău, Botoșani, Neamț, Vaslui, Suceava
Reducerile sunt C
33 vizitatori pe site

Cuprins
EDITORIAL
MOLDOVA
Iasi
Bacau
Botosani
Neamt
Suceava
Vaslui
POLITICA
ECONOMIE
CULTURA
SPORT
RUBRICI
Suplimente
TRUP&SUFLET
REPORTER
NIMIC IN PLUS
TABLOID
ZIG-ZAG
AUTO
Top
STIRI DIN TARA
EXTERN

Anunțuri prin Google | Fortus Iasi | Statii Epurare | Proiect

Staţii moderne pe coridorul Civitas

Municipalitateaa organizat ieri o licitaţie în vederea achiziţionării de echipamente pentru amenajarea a 50 de staţii de transport public local de pe coridorul Civitas, Agronomie – Tudor Vladimirescu, şi adiacent acestuia, cu copertine şi city light-uri. Valoarea estimată a acestor echipamente este de 820.000 lei, fără TVA, sumă din care contribuţia municipalităţii este de 2 la sută, diferenţa fiind suportată de la Uniunea Europeană, prin proiectul Civitas. **„În criteriile de atribuire vom ţine cont în proporţie de 80 la sută de oferta financiară şi 20 la sută de termenul de furnizare şi punere în funcţiune"**, a declarat Cosmin Coman, directorul Direcţiei de Programe şi Servicii pentru Comunitate din cadrul Primăriei.

Cele 50 de staţii - dotate cu copertine, city-light-uri, bănci de aşteptare din inox, bare şi două locuri speciale pentru persoane cu dizabilităţi - vor fi livrate municipalităţii în termen de maxim 60 de zile de la semnarea contractului.

Fig. A3 Positive article in local newspaper about the modern shelters installed

http://www.bzi.ro/cum-vor-arata-noile-statii-ratp-184916

BUNĂ ZIUA IAȘI
390lei
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Prima pagina
Opinii
Actualitate
Eveniment
Social
Expres
Economic Local
Bursa Barfelor
Stiri din trafic
Stiri Pescaresi
Economic
National
Magazin
International
Plante miraculoase
Basarabia
Sport
Uniunea Europeana
Reteta zilei
Video Sport
Ghid Turism
Ghid Sanatate
Ghid Auto
Bacau
Neamt
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Cum vor arata noile statii RATP

Miercuri, 25 August 2010

Reprezentanții primăriei susțin că, în următoarele 40 de zile, 50 de stații RATP vor fi modernizate. Municipalitatea a prins finanțare prin programul european Archimedes, pentru modernizarea transportului public. Astfel, firma Smart Production SRL se va ocupa de montarea noilor stații, după ce a castigat licitația la primărie, ofertând suma de 760 mil lei fara TVA, în condițiile în care estimarea bugetara era de 820 mil lei fara TVA. "Astazi (ieri - n.r.) impreuna cu cei de la RATP, se trasează locurile. Vom începe mai întai cu 25 de locații, urmând si celelalte 25. In 40 de zile trebuie montate. Pe zona Copou inca nu se intra pentru ca statiile trecute adaptate la zona de panta. Statia consta intr-o copertina, o banca de inox si un city light cu harta orasului. Raman loc si pentru panourile de informare in timp real, ce trebuie achiziționate in cadrul proiectului", a declarat Beatrice Fotache, manager proiect. Mai intai, se va lucra in statiile de la Policlinica St. Maria, Policlinica St. Petru si Pavel, Spital Psihiatrie, Spital Recuperare, Gara, Casa Sindicatelor, Complex 1001 Articole, Sala Polivalenta, Hotel Moldova, Hotel Europa, str. Arcu, bd. T. Vladimirescu.

Contract cu dedicație

Smart Production a castigat lejer licitația, chiar daca la proces dura s-au inscris patru firme. Trei dintre ele au renunțat, pentru ca, in calculul de sarcini, exista o condiție importanta, ce pare sa favorizeze firma Smart Production SRL. "Ofertantul va prezenta o machetă la scara de 1:1 pana la data deschiderii ofertei. Macheta va fi depozitata la sediul RATP Iași, strada Silvestru nr. 5", se arata in caietul de sarcini. Numai ca o astfel de machetă costa in jur de cinci mii euro. In aceste condiții, firmele Grafis Art SRL, Rodotex SRL si Aero Compozite SRL nu au mai participat la ședința de deschiderea a ofertelor. Reprezentanții firmelor au precizat ca nu se merita realizarea unei machete pentru ca, in cazul in care pierdeau licitația, nu ar fi recuperat banii. Astfel, nu poate fi exclusa suspiciunea ca licitația a fost dedicata firmei Smart Production SRL. Firma a mai prins un contract anul trecut, pentru furnizarea halelor metalice de la bazar.

Ciprian BOARU ciprian.boaru@bzi.ro

Fig. A4 Positive article in local newspaper about the modern shelters installed

ANNEX 3

Technical description of audio warning devices for visually impaired people (data sheet)

Audio warning devices for visually impaired people CAN - DAANV consist of 2 parts:

1. *The sound part itself containing:*
- Block broadcasting sound signals
- Sensor to detect ambient noise level
- Microprocessor-level analysis of environmental noise.

2. *Button to signal the intention of crossing the street:*
- Push button for signalling the intention of crossing the street
- Short beep to confirm the command
- Detection circuit for the current collor of the traffic lights (green, red, possibly yellow)
- Memory circuit to automatically control lights request
- Power source.

Mechanical characteristics of the device:
- Polycarbonate outer case for the actual sound part and metal housing for the command button
- Degree of protection: IP55
- Anti-vandal protection
- Mechanical protection of cables

Electrical characteristics of the device:
- Power: 220VAC +/- 15%, frequency: 50Hz.

Noise characteristics of the device:
- Minimum level of audible signal: 30 dB
- Maximum level of signal noise: 60 dB measured at 1m
- Acoustic signal for green:

60 pulses / min, with 50% fill factor
frequency of 800 Hz + / -10% modulated with a 20Hz signal
- Acoustic signal for red: was not imposed
- Optional audible signal for yellow (or, where applicable, for the last seconds of the chronometer counting backwards the seconds pedestrians have in order to cross the street):

120 pulses / min, with 50% fill factor
frequency of 800 Hz + / -10% modulated with a 20Hz signal
- Noise detection and noise power setting depending on its level
  - for the street noise of 5dB, the sound power is 60dBA
  - for the street noise of 5dB, the sound power is 60dBA

Other features:
- Operating temperature: -25C - +50 C
- Emission of a sound signal with a maximum length of 2 seconds at a frequency of 2 kHz modulated at a frequency of 20 Hz when the application signals that an input from a user was received
- Optical signal to confirm the input (demand for crossing the street)
- Ignoring of inputs when pedestrian lights are green
- Absence of sound when traffic lights for pedestrians are not working.

Installation process
- The audio warning devices are mounted on the existing traffic light pillars at a minimum height of 2.5 m, using a clamping system adjustable to the thickness of the pillars
- The command button is mounted on the pillars at the height of 1 m using a system adjustable to the thickness of the pillars
- The wiring of the command button goes into the junction boxes of the traffic lights, which are located on the same pillar as the existing system.

ANNEX 4

Transformation and equipping of 10 minibuses - Technical Sheet

Electro-hydraulic lifting platform (description)

The type of lifting platform designed for disabled people has a linear movement, 350 kg weight lifting capacity, is completely automatic, and can be adapted to a wide range of vehicles (minibuses, ambulances, van-type commercial vehicles). The lifting platform is mounted in front of the backside door.

The main components of the lifting platform are:

1. platform
2. automatic flap on platform end
3. automatic ramp linking vehicle's floor
4. protection handles right/left, automatically used on/off
5. lifting arms
6. mechanic bolt for start position
7. hydraulic cylinder elevator
8. electro-hydraulic group
9. cable mobile command for on /down /up / off positions
10. frame
11. mobile command support
12. main contact with key contact
13. hand protection device on handrails
14. lever for manual pump
15. manual pump in function
16. access on commands for damaged issues
17. electrical safety device for lifting commands
18. ergonomic switch.

Fig. A5 Lifting platform

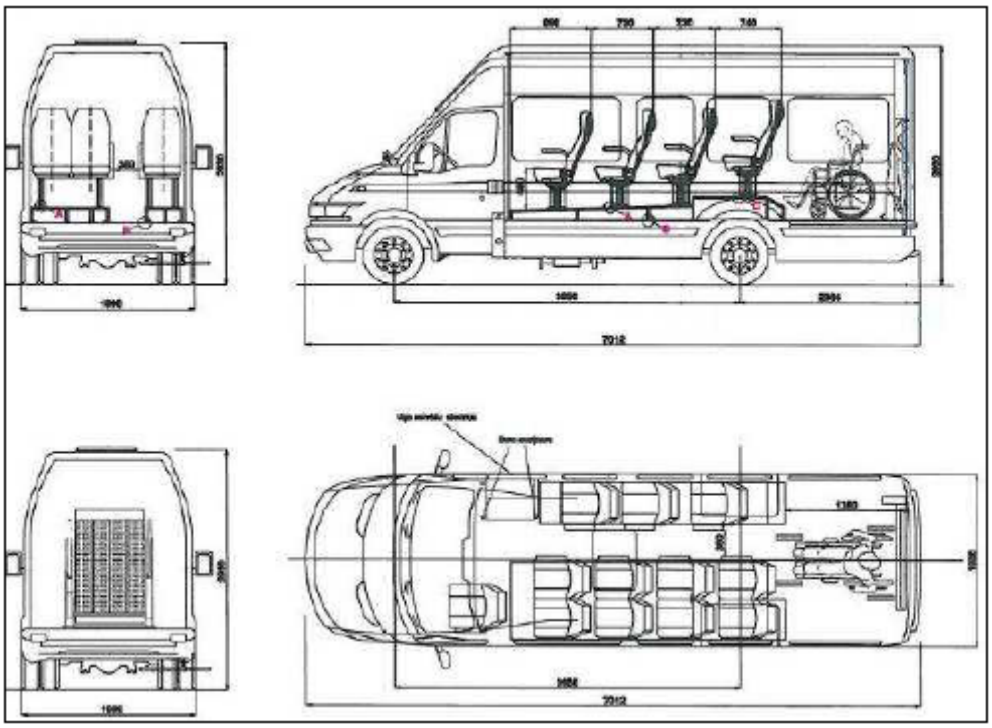


Fig. A6 The position of the wheelchair inside the minibus

The minibuses have a special place for wheelchairs, communication devices next to the priority chair, pictograms placed inside and outside the minibus, antiskid floor of maximum 8% inclination and wheelchair blocking system.

ANNEX 5

Transport stops (with facilities for disabled persons) - Technical Sheet

The Municipality of Iasi acquired shelters in order to modernise 50 stops for the public transport

The installation of the new street furniture was aimed at offering beneficiaries of public transport (including disabled people) fully accessible and safe access to public transport. The quality of public transport has thus improved, which resulted in more users of this service.

The technical characteristics of the new street furniture are:

- ground level – (5x1,5) m
- dimensions: height = 2.5 m, width = 1.5 m, length = 5.0 m

The resistance structure was constructed of rectangular tubes assembled by welding or by fixing them together, and, where appropriate, duplex glass panels were mounted between them.

The roof is modular. It is composed of 6 plates mounted 2 by 2, which thus form 3 separate sections, each reinforced with 2 rectangular tubes (80x80x4 mm).

The roof is supported by the metal structure through stainless steel pillars and is covered on its superior side by a transparent cellular polycarbonate plate of 10 mm thickness.

The shelter includes a moulded stainless steel bench of 1.2÷1.3 mm thickness centrally mounted on the two special supports of the metal structure.

The side walls are different: the right wall is made of moulded duplex glass and the information panel makes up part of the left side wall and is mounted on the metal structure of the shelter.

Fluorescent tubes are mounted within the roof.

Fig. A.7 Modern bus stop shelter – structure

ANNEX 6

The locations of the modernised stops (see Map 2); the name before each dash represents the name of the stop, and the name after the dash indicates the side of the street the stop is located on by pointing to the direction of public means of transport passing through that stop:

1. Filarmonica – Tg Cucu
2. Filarmonica – Pta Unirii
3. Tg Cucu – Pta Unirii (Golia1)
4. Tg Cucu – Pta Unirii (Golia2)
5. Tg Cucu – Padurii-Rond Tg Cucu
6. Tg Cucu at Hotel Europa
7. Bucegi – Pta Unirii
8. Pta Eminescu – Copou
9. Universitate – Triumf
10. Triumf – Stadion
11. George Cosbuc – Agronomie
12. Liceul Sportiv – Agronomie
13. Rond Copou – exist of the turning loop towards the stadium
14. Parcul Expozitiei – Triumf
15. Stadion – Coborare
16. Gradina Copou – Universitate
17. Moara 1 Mai – Metro
18. Munca invalizilor – Metro
19. Munca invalizilor – Moara 1 Mai
20. Moara 1 Mai – Fundatie
21. Moara 1 Mai – Rond Canta
22. Octav Bancila – rond Canta
23. Octav Bancila – Gara
24. Mc Donalds – Pasaj Alexandru cel Bun
25. RATP – Canta
26. Piata Unirii – Filarmonica
27. Piata Unirii – Gara
28. Spiridon (Bloc Carmen) – Tg Cucu
29. Hotel Europa – Moldova
30. Hotel Europa – Tg Cucu
31. Moldova Mall – Sala Sporturilor
32. Sala Sporturilor – Podu Ros
33. Sala Sporturilor – Hotel Moldova
34. Podu Ros – CUG
35. Podu Ros – Center
36. 1001 articole – Bucium
37. 1001 articole – Podu Ros
38. Casa Sindicatelor – Bucium
39. Spital Socola – Bucium
40. RATP Sectia 1 – Tudor Vladimirescu
41. Bld T Vladimirescu – Baza 3
42. T Vladimirescu T17 – Tg Cucu
43. Bucsinescu – T Vladimirescu
44. Bucsinescu – Elena Doamna
45. Elena Doamna – Tg Cucu
46. Elena Doamna – Bucsinescu
47. Minerva – Dacia
48. Minerva – Pasarela Alex cel Bun
49. Vointa – Billa
50. Moldova Mall – Hotel Europa

ANNEX 7

Questionnaire

M. 48 – Provision for disabled persons in Iasi

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age:_____ years old.
2. Sex: □ m □f
3. Profession: _____.
4. Latest school attended: _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket □ set of 10 trips □ monthly season ticket

6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____

7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know

8. Have audible and visual alarms for people with disabilities been installed at 16 controlled intersections as part of the CIVITAS project?
   □ yes □ no □ I don't know

9. Has the public transport company equipped 10 minibuses with hydraulic platforms to facilitate the access of people with disabilities to public transport services as part of the CIVITAS project?
   □ yes □ no □ I don't know

10. Were 50 stops designed to grant unrestricted access of people with disabilities to public transportation as part of the CIVITAS project?
    □ yes □ no □ I don't know

11. To what extent do you agree with the following statements (with a grade from 1 to 5, where 1 means "strongly disagree" and 5 "strongly agree")

Are public transport services accessible to all people, including people with disabilities?	1 2 3 4 5
Do people with disabilities experience major problems in using the public transport system?	1 2 3 4 5
Does the public transport company have public transport vehicles adapted to the needs of people with disabilities?	1 2 3 4 5
Should the public transport company increase the number of vehicles fitted with access ramps in order to facilitate the access for people with disabilities?	1 2 3 4 5
Should the public transport company increase the number of shelters modified so as to facilitate the access of disabled people?	1 2 3 4 5

12. The idea of transforming the vehicles and of designing special bus stops so that public transport becomes easy to use by people with disabilities seems:
    □ very good □ good □ not bad □ bad □ very bad

13. The idea of installing sound and visual warning devices at pedestrian crossings in 16 of the major intersections of Iasi to help blind people cross the street seems:
□ very good □ good □ not bad □ bad □ very bad

14. To what extent do you agree with the following statements (with a grade from 1 to 5, where 1 has the meaning "strongly disagree" and 5 "strongly agree")

Do the minibuses of the public transport company equipped with a hydraulic lifting ramp provide easy access to public transport services for persons with disabilities?	1 2 3 4 5
Do the low-floor buses of the public transport company equipped with an access ramp provide easy access to public transport services for persons with disabilities?	1 2 3 4 5
Do the stops of the public transport company equipped with access ramps and special shelters provide easy access to public transport services for persons with disabilities?	1 2 3 4 5
Do the audio warning devices installed at controlled intersections facilitate the daily movement of persons with disabilities?	1 2 3 4 5
Does the city of Iasi offer proper conditions to persons with disabilities for their daily trips?	1 2 3 4 5

15. Ten RATP minibuses were converted to be easily used by people with disabilities. Do you think this number is enough?
□ yes, it's enough □ no, but it is a good start □ no, I think all minibuses should have these facilities □ all public means of transport (minibuses, buses, trams) should be easily accessible to disabled people.

16. Do disabled people find it easy to use public means of transport?
□ yes □ no

17. Would it be quite easy for RATP to take the necessary steps so that public transportation is accessible to people with disabilities?
□ yes □ no

18. If public transport were accessible to everybody, including people with disabilities, would Iasi be a more modern and civilised city?
□ yes □ no

19. Do you have any suggestions so that public transport services become easier to use by people with disabilities?

Thank you!

Executive summary

A few years ago, the municipality of Iasi started to develop a sustainable transport network. At a first stage, part of the tram tracks were modernised along with the corresponding road infrastructure. Then, through the ARCHIMEDES project, Iasi continued to develop the sustainable urban transport system by constructing 11 km of bicycle lane and bicycle parking facilities. Campaigns were organised in the open space and in schools and universities in order to encourage citizens to use bicycle as a daily means of transportation.

In order to assess the impact of the measure the following methods were used:

- Surveys in the area of impact with the following key results.
    - The percentage of the people who had heard about the measure as a result of the campaigns increased by 51%.
    - For the assessment of the acceptance level, we kept track of how the people's sense of security regarding bicycle use as a means of transportation developed over the past three years. 9% of the respodents perceive now that the urban area of Iasi has grown safer for bicycle riders.
    - With regard to the average modal split (trips) indicator, the percentage of respondents using public transport services doubled after the measure was implemented, the number of bicycle riders increased by 11%, and the percentage of private car users decreased by 4%.

  The surveys were carried out in the area of Tudor Vladimirescu campus, and their results only characterise the local community, composed mainly of university students. Moreover, the results may have been influenced by the presence of two bicycle rental spots that are administered by an NGO. Renting bicycles from there is free of charge.

- The number of bicycle riders were counted during five days twice after implementation (in 2011 and in 2012), on a certain segment of the lane alongside which there are many faculties. The results showed an increasing trend, from an average of 111 users per day recorded in 2011 to an average of 148 in 2012.

The following can be regarded as lessons that were learnt during the implementation of this measure:

- in order to gain popularity among the inhabitants of the city, bicycle lanes should be promoted through large-scale campaigns and contests;

- the bicycle lanes have to be built according to the characteristics of the urban arrangement (road, pavement, green areas, etc.) and compromises have sometimes to be made in order to find the best solution both for motor vehicles and for bicycles; when building a bicycle lane one must take into account the characteristics of the urban arrangement

- it is a good idea to link this measure to a part of a wider development project of the city NGOs that encourage the use of the bicycle as a means of transport should be involved in bicycle-related actions.

From the perspective of the evaluation, what this measure has brought new for Iasi are the 11 km of bicycle lane; even more important is perhaps the fact that people have reacted positively to this measure: they attended the campaigns in great numbers and are using the lane more and more frequently.

IAS 59 - City cycle routes in Iasi

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To create a sustainable urban transport system

(B) Strategic level:

- To encourage people (of all ages) to reflect on their transport habits and to use soft modes of transport.

(C) Measure level:

- To create facilities for cyclists by creating 11 km of bicycle lane, and bicycle parking places.
- To increase the number of bicycle users.
- To decongest the traffic by reducing private car use

A1.2 Target groups

- people who live, work or study in the proximity of the bicycle lane and want to change their travel behaviour;

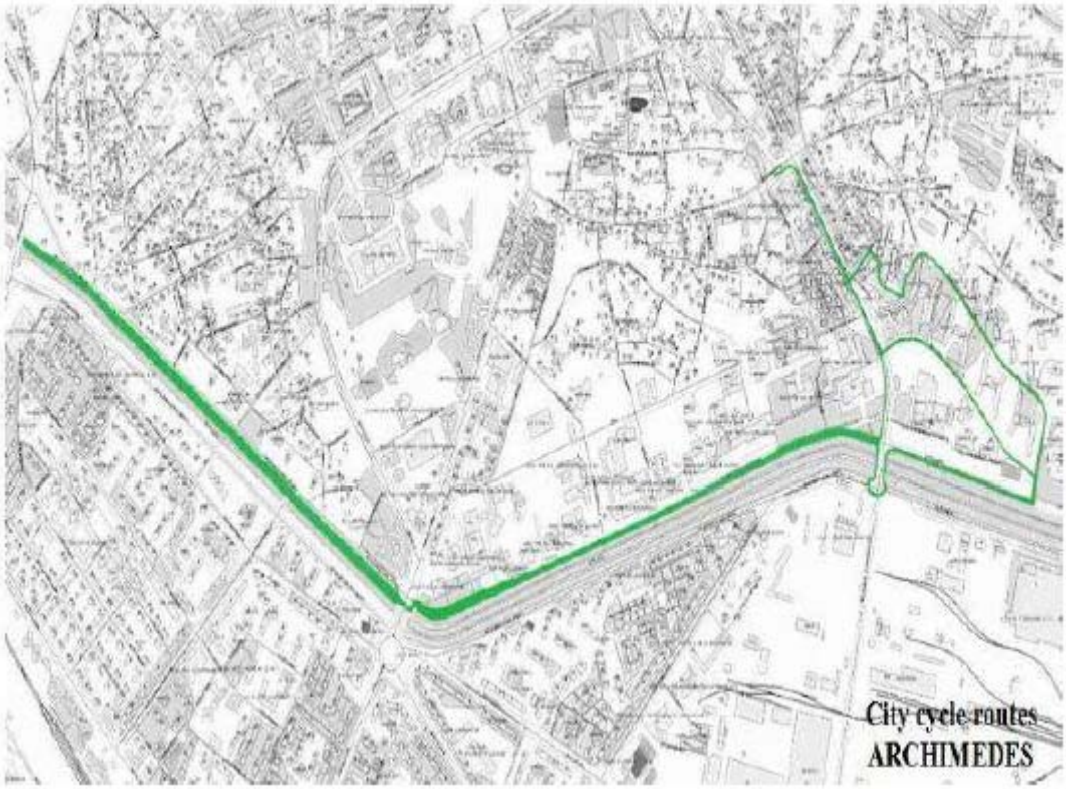
- people who use the bicycle lane for recreational purposes

A2 Description

Iasi has implemented 11 km of bicycle lane along several streets, which are listed in Table 1. The bicycle lane is located along the CIVITAS corridor and on the adjacent streets (Map 1). Four segments of the bicycle lane were built on pavements reserved exclusively for bicycles, one segment shares the pavement with pedestrians and two were created on one-way streets. Where the bicycle lane crosses roads or footways (at seven spots), special coloured markings were used to mark out the space for cyclists. Campaigns were organised in order to encourage people to take up cycling.

Section	Length (m)	Type
Bucsinescu – Pod Tudor Vladimirescu	1360	Bike lane on pavement
Bulevard D. Mangeron	2746	Bike exclusive lane
Bulevardul Chimiei	664	Bike exclusive lane
Splai Bahlui Mal Stang	2496	Bike exclusive lane
Aleea Gh. Alexa	1130	Bike lane on a one-way street
Splai Bahlui - Bulevardul Tudor Vladimirescu	710	Bike exclusive lane
Aleea V. Petrescu	1894	Bike lane on a one-way street
Total	11000	

Table 1 List of bicycle lane segments in Iasi



Map 1 The first cycle route in Iasi

Before the measure was implemented, cyclists rode on the pavement, which was sometimes difficult to use because of the bad infrastructure (Fig. 1). That imposed the introduction of bicycle lanes (Fig. 2).

Fig. 1 Example of pavement before the bicycle lane was created

Fig. 2 The same location after the bicycle lane was created

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New mode of transport** – the implementation of these tasks represents a new approach to bicycle use as a daily mode of transportation.
- **Targeting specific user groups** – all citizens can benefit from the advantages offered by this measure.

- **New policy instrument** – in order to encourage people to shift to more sustainable modes of transport, it is important to work further on improving cycling facilities.
- **New infrastructure solutions** – a new infrastructure for bicycles had to be created (i.e. bicycle lane and parking facilities) because Iasi had not had any bicycle lanes before.

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

Before this measure was implemented, there were no bicycle lanes in Iasi. The very few people who rode a bicycle had to use either the pavement or the road (Fig. 3).

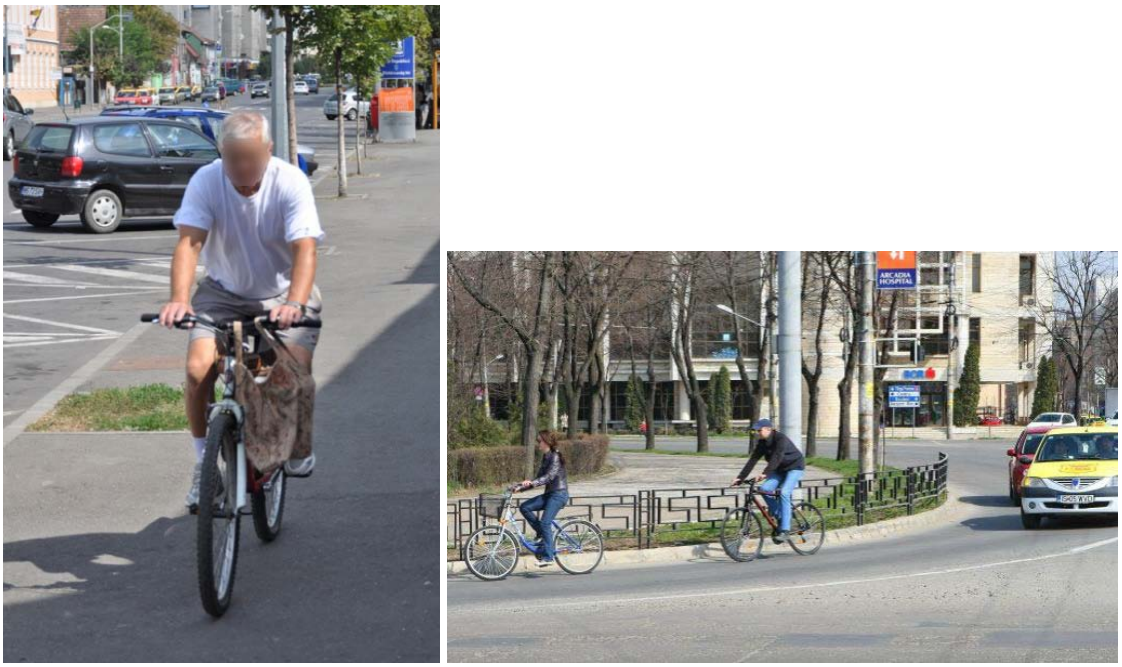


Fig. 3 People riding bicycles on the pavement or on the street

Consequently incidents were likely to happen between cyclists and pedestrians. On the other hand, drivers did not regard bicycle riders as participants in the traffic with equal rights, some even harassed them, which generated conditions for accidents. The only way for bicycle riders to avoid them was to pay increased attention.

Unfortunately**,** at city level we were unable to find any information on modal split that considered the bicycle as means of transport.

B4 Actual implementation of the measure

Stage 1: Public acquisition procedure and signing of the contract (*September 2009***)** – the procedure for awarding a contract for the design of the bicycle lane was launched and eventually the contract was signed.

Stage 2: Tender notice (*December 2009*) – the contract notice for the construction of the cycle lane was published.

Stage 3: Signing of the contract (*March 2010*) – the contract for the construction of the bicycle lane was signed.

Stage 4: Construction works (*April-August 2010*) – 11 km of bicycle lane were constructed, including bicycle parking facilities, and the sections of the lane that cross roads or footways were marked.

Stage 5: Inauguration and campaigns (*September-October 2010*) – The new bicycle lane was inaugurated on September 22, 2010. The event also included a bicycle parade and several bicycle contests.

Stage 6: Evaluation (*November 2009, February 2011, and February 2012*) – Surveys were carried out to demonstrate the impacts of the measure. Bicycle traffic was measured within the periods after the implementation of the measure.

The city of Iasi has built a demonstration bicycle lane and facilities for cyclists along 11 km of pavements and streets. The bicycle route has incorporated dedicated lanes and special coloured street markings to indicate the bicycle route. Two bicycle parking facilities have been built with funding from the Municipality of Iasi. These new facilities have been promoted through a campaign in order to encourage the inhabitants of lasi to cycle. A specialised marketing company was contracted in order to organize the promotional activities.

The purpose of building bicycle lanes is:
· to reduce car traffic,
· to encourage school and university students to use the special lanes for travelling to and from their educational units.

The construction works consisted of the following activities: installing of curbstones, depositing a ballast layer to provide the foundation, laying a sand layer and flattening the bumps with a height between 2 and 5 cm, installing self-locking paving, cleaning surfaces where needed, marking the cycling direction, and installing 60 specific road signs.

The lane crosses a significant part of the city, including an area with very busy traffic, which links the Tudor Vladimirescu student campus with other traffic nodes (Podu Ros, Podul de Piatra). There are many education centres, as well as a recreation ground, in this area.

The lane is located in the metropolitan area of the city of Iasi (see Map 1). Because the characteristics of the streets (roads, pavements, green areas, trees, buildings) differed along the route the lane was to be built, the width of the lane had to vary with the spatial constraints – the lane can be 1.6 m, 2.2 m, or 2.5 m wide. The 11 km-long lane was designed for both directions and its area measures 10,784.50 m^2.

Apart from building the bicycle lane, several activities were organised as part of a campaign designed to encourage bicycle use in the city of Iasi by increasing the awareness of the necessity to reduce pollution and excessive traffic. This was achieved through an efficient and transparent communication campaign involving all type of audiences.

Bicycle use was promoted in a very positive way in high schools and other academic and social environments.

This campaign to encourage bicycle use consisted of two major components:

1. organisation of events for promoting bicycle use and
2. school education and media promotion campaign for using bicycles.

Events for promoting bicycle use:

The opening of the bicycle lane

The new bicycle lane was inaugurated on September 22, 2010. The event began with a press conference that took place at the City Hall (Fig. 4). The press conference was attended by representatives of local authorities, personalities and celebrities from Iasi, and mass media representatives – among them a national television producer, four actors from the National Theatre, one national television sport news presenter, and local councillors.

Fig. 4 Press conference at the City Hall at the opening of the bicycle lane

The event also included a bicycle parade, to which the same audience was present together with inhabitants of Iasi (Fig. 5 and Fig. 6). The parade started in Podu de Piatra, and ended in Tudor Vladimirescu (i.e. it ran along the whole trail shown in Map 1). The participants travelled using their own bicycles or rented ones. The organizers offered all of them promotional materials, inscribed backpacks, and promotional T-shirts.

Fig. 5 The official opening of the bicycle lane by the Mayor of Iasi

Fig. 6 The bicycle parade

TRIAL Contest no. 1

In addition to launching the bicycle lane, a TRIAL contest was held on September 25, 2010 (Fig. 7 and Fig. 8). The competition was organised in front of the Palace of Culture and was structured on three categories:

- amateurs
- seniors and
- elites.

The competitors had to cover three routes, each with increasing difficulty (see Fig. 4 and Fig.5). All participants received promotional materials as gifts and incentives for taking part into the contest (inscribed backpacks, promotional T-shirts, water bottles for cyclists). The winners were rewarded with cash prizes.

During these two events the promoters distributed 10,000 flyers, 1000 brochures, 5000 notebooks, 2000 school timetables, 1000 pens, 1000 t-shirts, 200 water bottles for cyclists, and 200 inscribed backpacks. Ten banners and 100 flags were used in order to mark the route of the bicycle lane.

Fig. 7 TRIAL Contest No.1

Fig. 8 TRIAL Contest No.1

Bike orientation contest

On October 2, 2010, the City Hall organised a bike orientation contest (Fig. 9). It took place on the track of the new bicycle lane (Tudor Vladimirescu - Podul de Piatra) and consisted of having to identify and pass through three check points situated on the track. There were three age categories:

- 12-15 years,
- 15-18 years and
- over 18 years.

The contestants were allowed to start from any check point. They were first registered there, they received a contest sheet that included three clues for each of the check points. At every check point the sheets were stamped. At the final one, the time was also recorded in order to calculate the time it took each of them to cover the route.

All participants received promotional gifts and diplomas, while the winners also received cash prizes (see Fig. 6). During this event 10,000 flyers, 1000 brochures, 5000 notebooks, 2000 school timetables, 1000 inscribed pens, 1000 inscribed promotional T-shirts, 200 inscribed water bottles for cyclists, and 200 inscribed backpacks were distributed.

Fig. 9 Bike orientation contest

"The whole family on green wheels" contest

This contest was organised on the October 3, 2010, along the Copou hill. There were three check points: at the Children's Palace, in the Exhibition Park, and at the Pedagogical High School.

The contest involved two categories of participants:

- individuals divided into three ages groups, and
- families.

In the family category, competitors received bonus points for each family member. The families were composed of parents and children – brothers and sisters, and even cousins. The contestants could start from any of the three check points. They were first registered, and then they received a contest sheet that had to be stamped at every check. At the end of the course, the time was calculated for each single contestant and for each family. All participants received diplomas and the winners received cash prizes.

During this event, 10,000 flyers, 1000 brochures, 5000 notebooks, 2000 school timetables, 1000 pens, 1000 T-shirts, 200 water bottles for cyclists, and 200 inscribed backpacks were distributed.

The second component of the campaign was based on a school education and media promotional campaign for using bicycles. This consisted of educational meetings in eight high schools and four universities from the 11 high schools and 5 universities located along the CIVITAS Corridor (Fig. 10 and Fig. 11). (There are a total of 29 high schools and 6 universities in Iasi.)

This campaign took place between October 6 and December 21, 2010. During these meetings, the school and university students received information about the importance and the benefits of cycling, as well as about the safety measures that need to be taken when riding a bicycle. These meetings where held by representatives of the City Hall, of the Public Health Direction, and of the Traffic Police.

In order to encourage the students to use bicycles, promotional materials where distributed: 10.000 flyers, 5000 note books, 2000 school time tables, 1000 inscribed pens, 1000 brochures, 1000 inscribed T-shirts, 400 inscribed water bottles for cyclists, and 400 inscribed backpacks. The distribution of all promotional materials (see figures 12-15) was completed by January 10, 2011.

Fig. 10 Meeting in a high school to promote bicycle use

Fig. 11 Meeting with students to promote bicycle use

The mass-media promotional activities consisted of radio and TV promotion, in addition to publicity in newspapers and to two press conferences. The first press conference was held at the inauguration of the cycle lane, on September 22, 2010, and the second one, at the end of the campaign.

PROMOTIONAL MATERIALS

Fig. 12 Promotional flyers

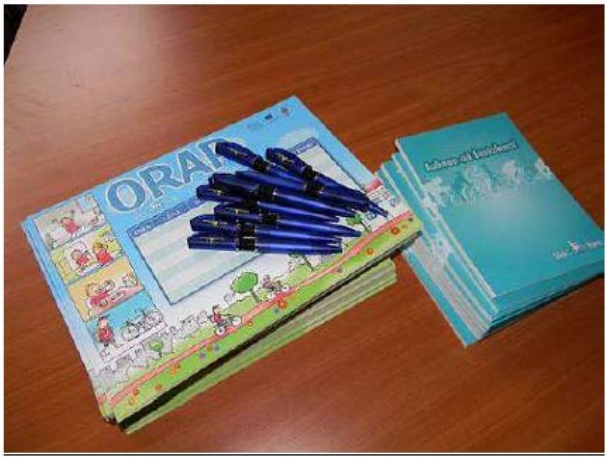


Fig. 13 School timetables, notebooks and pens

Fig. 14 Promotional brochures

Fig. 15 Inscribed backpacks, promotional T-shirts and water bottles for cyclists

During the campaign, several communication activities were performed. These included press releases on the events that were organised, newspaper articles, radio broadcasting, news published on portals and other websites (see Annex 1).

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure IAS 22 – Access control to the historic centre** – In order to protect the integrity of the historic centre, green modes of transport – which include, of course, bicycles – have to be used in this area.
- **Measure AAL52 – City bike scheme in Aalborg, 55 – Cyclist priority in Brighton&Hove, BH 58 – City bike scheme in Donostia-San Sebastian, DSS 60 – Cycle transport improvements in Usti nad Labem, UNL 62 – Cycle transport improvements in Monza** – all these cities promoted cycling as a means of transportation, and opinions and implementation results have been shared.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

The scope of this measure is to encourage people to use soft mode transport for travelling. There are two major impacts:
- A social impact because the measure addresses to all citizens that work or learn near in the proximity of the Civitas corridor and want to use bicycles as a means of transportation;
- An environmental impact because the use of soft modes of transport means less cars in traffic. It is difficult to measure the environmental impact because it is possible that the number of bicycle users to is very low and the improvement of air quality as a result of this measure to is insignificant.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ECONOMY					
2b			**Capital Costs**	**Capital costs**	Implementation costs	Euro
2c			**Maintenance costs**	**Maintenance costs**	Maintenance costs	Euro
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	survey	Index (%),
14			Acceptance	Acceptance level	survey	Index (%),
	TRANSPORT					
29		**Transport system**	Modal split	Average modal split (trips)	survey	Index (%),
	NEW			Users	No. of bicycle users	Counting

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2b	Capital Costs	173,171 euro	resulted from the financial offer of the supply companies	Once, when the contract was signed
2c	Maintenance costs	As low as possible	The company that built the bicycle lane bore these costs during the warranty period.	---
13	Awareness level	Increased	A survey was conducted to assess these indicators. The interviews* were carried out by students in the proximity of the bicycle lane that was to be built during five working days, before and after the measure implementation. 100 persons were interviewed in each stage (see section C.1.2 for details). Some details on the survey campaign are given below. **November 2009.** In order to assess the awareness level, the respondents were asked if they had heard about the CIVITAS project and if they knew that 11 kilometres of bicycle lane and bicycle parking facilities were going to be built as part of this measure. In order to evaluate the acceptance indicator, the respondents were asked: if cycling was good for health; if there were any bicycle lanes in Iasi at that time, if they were going to use bicycles for their daily trips, if the city represented a dangerous place for cyclists, if building bicycle lanes would create a safety environment for cyclists, etc. In order to determine the average modal split of passenger transport, the respondents were asked what means of transportation they used for their daily trips. **February 2011 and February 2012.** Another set of 100 questionnaires was used for face-to-face interviews in February 2011 and February 2012. Surveys were conducted in the same place as in 2009. The questions for assessing the awareness level and acceptance level indicators remained the same, but they were adapted to the stage the task was in (already implemented). The questions for the average modal split of passenger transport remained the same.	Before – November 2009 After - February 2011 and February 2012
14	Acceptance level	Increased		
29	Average modal split	Increased		
NEW	Users	Increased	The number of cyclists that used the bicycle lane was counted.	February 2011 and February 2012

* The questionnaire used for the interviews is to be found in Annex 2.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	2b, 2c, NEW-users	Not applicable	-
	13,14,29	M15	Iasi, PTI
Collection of after data	All indicators	M30, M42	Iasi, PTI
D12.2 Baseline and first results from data collection	All indicators	Month 39	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

We can consider 2008 as a baseline year. Until that year, there had been no dedicated bicycle lanes in Iasi. Therefore, cyclists had to use the pavement or the roadway. The former alternative meant that pedestrians were in danger to be injured by bicycles, and the latter was very dangerous for cyclists because of potential road accidents. These were the reasons for building a bicycle lane with the help of the ARCHIMEDES project.

The data collection method for the evaluation of the measure is as follows:

- The economic indicators (costs/benefits) have been obtained by analysing internal data of the public transport company and / or of the Iasi Municipality of Iasi.

- The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

  The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people) after the measure has been implemented, thus making it possible to compare the results of the “before” and of the two “after” situations. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

  The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

  The interviews were carried out in the same place, in the proximity of the bicycle lane, during the three periods the surveys took place in: once before and twice after the implementation of the measure. We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

- The new indicator, called "users", was obtained by counting. For the “before” situation, assimilated with the BaU, information about the stops Bucsinescu and Bucegi was extracted from data related to the traffic through Bucsinescu and Bucegi. After the bicycle lane has been built, cyclists were counted in a single location on the segment between T. Vladimirescu and Podu Ros.

C1.3 Methods for Business as Usual scenario

Previously there were no bicycle lanes in Iasi, which meant that cyclists had to use the pavement or the road. On October 2009 the number of cyclists counted at two locations along the CIVITAS corridor was as follows (Table 2):

Place	Time interval	Cyclists
Bucsinescu	6.30 a.m. - 9.30 a.m.	3
	12.00 a.m. - 5.00 p.m.	13
Bucegi	6.30 a.m. - 9.30 a.m.	5
	12.00 a.m. - 5.00 p.m.	7

Table 2 Counting of cyclists in October 2009

Unfortunately, there is no information on the number of cyclists between T. Vladimirescu and Podu Ros, which is the area where bicycle riders were counted after the measure was implemented.

C2 Measure results

C2.1 Economy

Table C2.1.1 Capital costs

Indicator	Euro without VAT
2b. Capital costs	288,947 Euro
2c. Maintenance costs	---

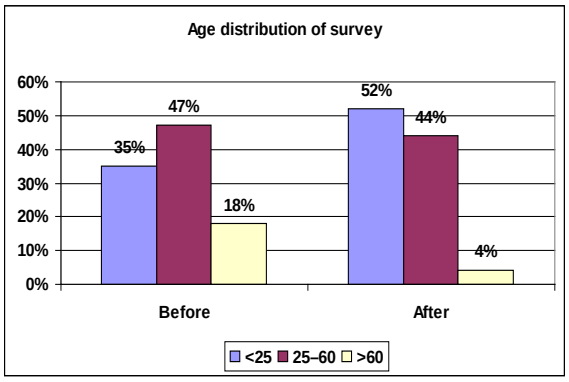
The rate exchange is 1 Euro = 4.5 Lei
Capital costs include the costs for building the bicycle lane, as well as the costs for the campaign for promoting bicycles as environmentally-friendly means of transport.

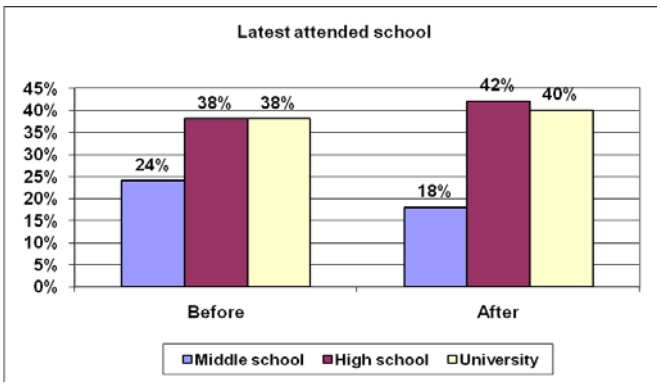
Maintenance costs cannot be estimated because the company that constructed the bicycle lane has performed maintenance operations within the warranty period.

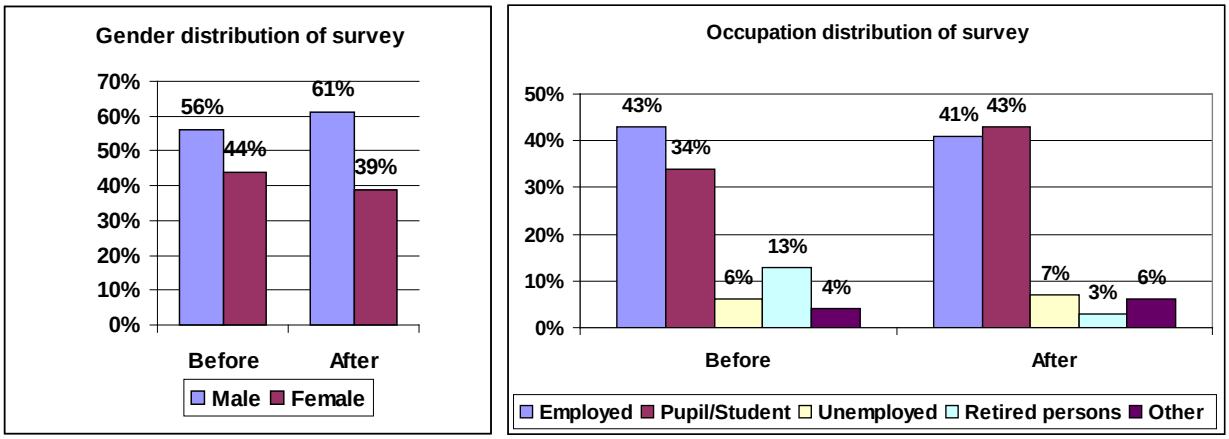
C2.2 Society

The interviews for assessing social indicators were carried out in the area of the campus Tudor Vladimirescu because the bicycle lane connects this area to many schools.

The interviews (before / after) were carried out always in the same place. A characterisation of the respondents is provided in the tables below (Fig. 16).







Characterisation of the respondents

On analysing the characteristics of the respondents (Fig. 16), we notice the following evolutions in the "before" and "after" situations:

- while in the "before" situation most of the interviewees were within the 25 to 60 year-old bracket (47%), in the "after" situation most of them were under 25 years of age (52%);
- the percentage of the interviewees who attended only high school is almost equal to the percentage of those who had university education (38% and over 40%, respectively);
- most of the respondents in both situations were male (56% and 61%, respectively);
- while in the "before" situation most of the respondents are employed (43%), and 34% are students, in the "after" situation their number is almost equal (43% and 41%, respectively).

Table C2.2.1: Awareness indicator

Indicator		Before (2009)	After (2011)	After (2012)
13. Awareness (%)	1. Yes	15%	56%	66%
	2. No	4%	1%	0%
	3. I don't know	81%	43%	34%

The following questions were asked regarding the awareness core indicator (Annex 2):

a. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?

b. Does one of the CIVITAS measures applied in Iasi stipulate the creation of a bicycle lane along certain streets in the area of the Tudor Vladimirescu campus?

Both the table above, C2.2.1, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

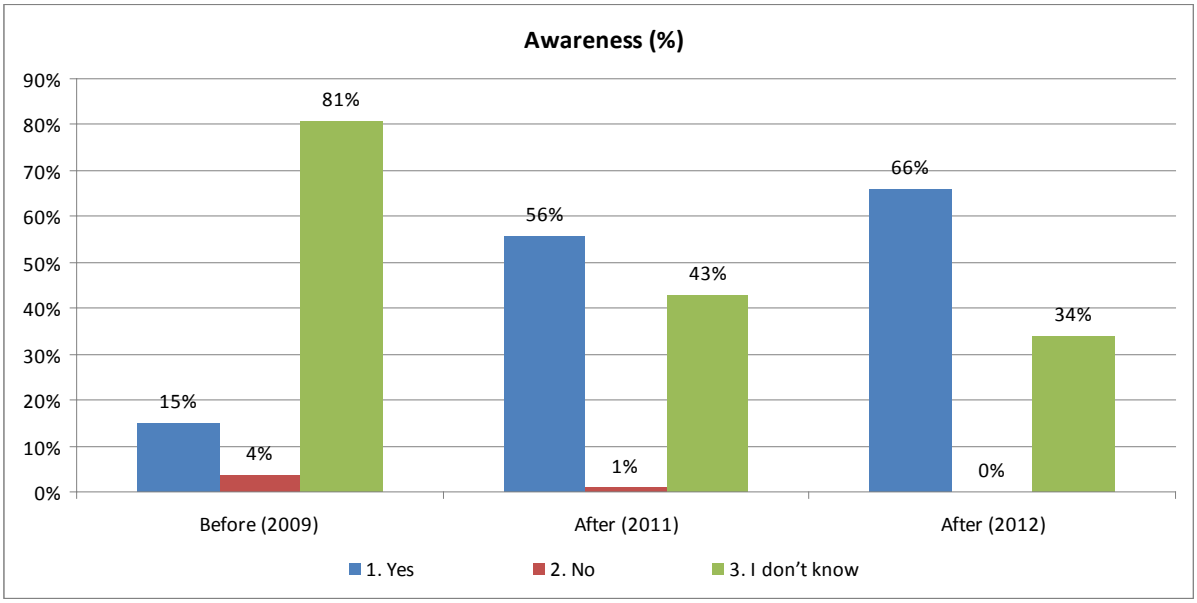


Fig. 17 Awareness level

On analysing the awareness level indicator, Fig. 17, we noticed an increase in the number of people that had heard about the CIVITAS project and about the bicycle lane that was to be constructed, from 15% in 2009 to 56% in 2011 and to 66% in 2012. This means that the campaigns organised after the implementation phase had a positive impact on people.

Table C2.2.2 Acceptance level

Indicator		Before (2009)							After (2011)							After (2012)						
		a	b	c	d	e	f	Av.	a	b	c	d	e	f	Av.	a	b	c	d	e	f	Av,
14. Acceptance level (%)	1. total disagreement	0	17	3	3	3	7	4	0	5	0	1	0	0	0	0	4	1	2	0	1	1
	2.	3	12	11	9	7	6	7	0	15	0	16	0	8	8	0	10	2	17	0	10	9
	3.	8	26	21	27	13	22	21	0	45	4	42	5	52	33	0	49	1	41	2	51	31
	4.	11	20	16	28	33	13	25	3	23	21	35	16	36	29	2	22	18	34	17	32	28
	5. total agreement	78	25	49	33	44	52	43	97	12	75	6	79	4	30	98	15	78	6	81	6	31

Regarding the acceptance core indicator, people were asked the following questions:
a. Is cycling good for health?
b. If there were bicycle lanes in Iasi, would you use a bicycle for your daily trips?
c. If more people used bicycles for their daily trips, would Iasi be a less polluted city?
d. Is the city is a dangerous place for cyclists?
e. Would building a bicycle lane mean more safety for cyclists?
f. Do drivers show little respect to cyclists in traffic and pay very little attention to them?

We chose to graphically represent only questions d, e and f because they underline the sense of safety regarding cycling.

Both the table above, C2.2.2, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the three questions for each of the five level of agreement.

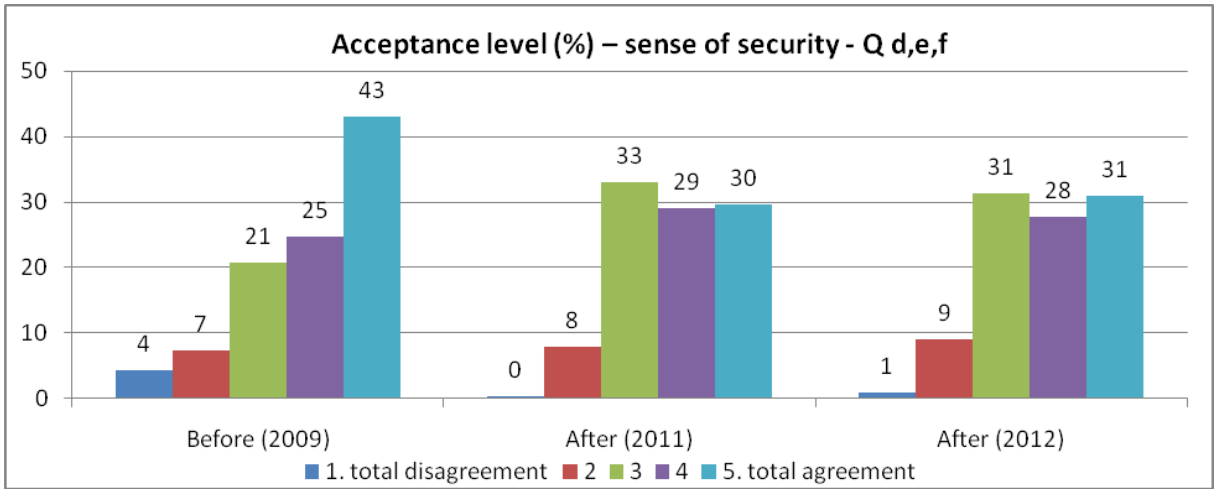


Fig. 18 Acceptance level – sense of security

Fig. 18 reveals that people perceive cycling as a dangerous means of transportation in Iasi: 68% in 2009 (points 4 and 5). After the measure was implemented, we recorded a decreasing tendency in this respect, to 59% in 2011 and 2012. Although this decrease represents a positive attitude of people, there is still a lot of work to be done in order to ensure the conditions for cycling safely in our city.

C2.3 Transport

The average modal split indicator was determined by interviews in the same conditions as for the social indicators (C2.2).

Table C2.3.1: Average modal split indicator

Indicator	Transport modes	Before (2009)	After (2011)	After (2012)
29. Average modal split (%)	Personal car	17%	15%	13%
	Bicycle	8%	16%	19%
	Public transport	8%	14%	16%
	Walking	61%	52%	49%
	Other	6%	3%	3%

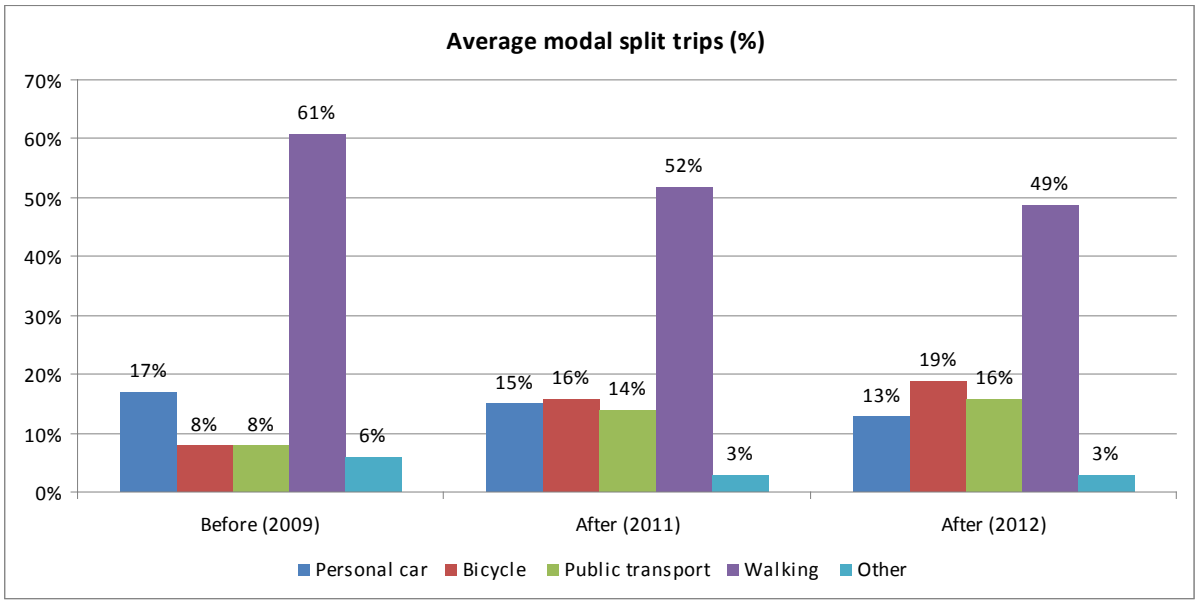


Fig. 19 Means of transportation used on a daily basis (average modal split)

When asked what means of transportation they use for daily trips, many of the respondents answered they preferred walking to their workplace or to their educational institutions. The encouraging part of the answers to this question is that the percentage of the respondents that use bicycles increased from 8% in 2009, to 19% in 2012 (Fig. 19). A reason for this may be that the surveys were carried out in the area of Tudor Vladimirescu campus, and their results only characterised the local community, composed mainly of university students. Moreover, the results may have been influenced by the presence of two bicycle rental spots that are administered by an NGO. Renting bicycles from there is free of charge.

C2.4 User

The user indicator represents the average daily number of cyclists counted for each time interval considered for the study.

Table C2.4 Users indicator

Indicator	Before (2009)	After (2011)	After (2012)
Users - cyclists	28	111	148

BaU scenario:

As already mentioned, the number of users we used in the BaU scenario was counted in two locations along the CIVITAS corridor, Bucsinescu and Bucegi, in October 2009. Cyclists were counted both during and outside rush hours during 5 consecutive workdays, then their mean number per day was calculated.

Hours		6.30 a.m.-9.30 a.m.	12.00 a.m. – 5.00 p.m.
Users - cyclists	Bucsinescu	3	13
	Bucegi	5	7
	Total	28	

Table 3 The average number of cyclists counted for each time interval

After implementation:

After the bicycle lane has been created, cyclists were counted in a single location on the segment between T. Vladimirescu and Podu Ros, in February 2011 and February 2012. The reason for choosing this segment of the lane was because it links no less than ten faculties, the education authority of the Technical University and a national research institute in physics. Bicycle riders were counted both during and outside rush hours, and their mean in the two time intervals was calculated. The following results were obtained:

Hours		7.00 a.m.-10.00 a.m.	5.00 p.m. – 6.30 p.m.	Total
Users - cyclists	2011	61	50	111
	2012	72	76	148

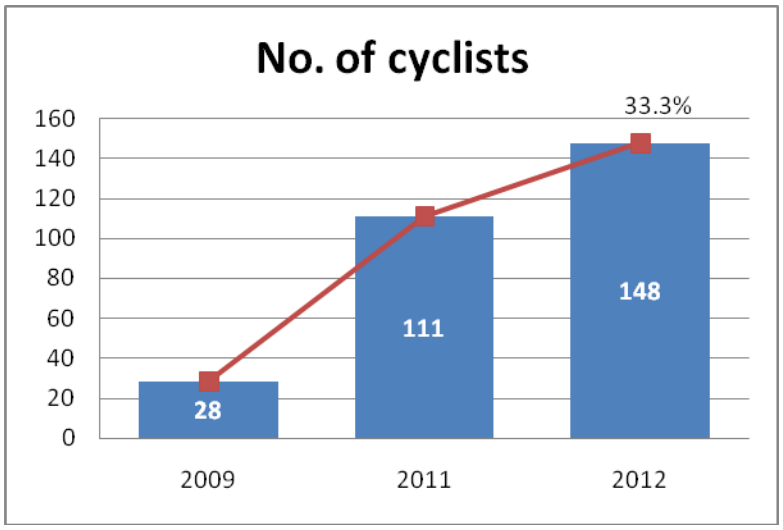


Fig. 20 Users - cyclists

We are aware that it is not right to compare the situation before the implementation of the measure (BaU scenario) to the "after" phase; we only want to point out that, in 2009, in the Bucsinescu and Bucegi areas the number of cyclists was very low because of the lack of proper infrastructure. After the bicycle lane was built, the sense of security among cyclists increased, and they began to use more often bicycles as means of transportation, with an increase of 33% in 2012 compared to 2011 (Fig. 20).

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To build 11 km of bicycle track	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Fully achieved ★★★ = Exceeded

C4 Upscaling of results

For the future there are two projects the city of Iasi is willing to engage into: the design and construction of two new bicycle lanes connected with the lane built within the ARCHIMEDES project.

One of these projects would involve the construction of a 7.5 km lane, which would cross the city from East to West, and the other one would involve the construction of a 6.7 km lane which would connect the northern and the southern part of the city (Annex 3).

C5 Appraisal of evaluation approach

One of the difficult points of the evaluation was the fact that we did not find any records on the number of cyclists before the implementation of the measure. Therefore we were not able to make a realistic comparison between before and after data.

It is important to mention that the surveys were conducted to evaluate the impact of the measure. They were carried out in the area of the Tudor Vladimirescu campus (with a capacity of over 7000), which is connected through the bicycle lane with the ten schools in the area. We picked this area in order to determine the direct impact of the measure; we did not intend to do a case study and extrapolate it to the entire city. Thus, the results of the surveys characterise only the local community, composed especially of university students. Moreover, the results may have been influenced by the presence in the area of two bicycle rental spots that are administered by an NGO. Renting bicycles from there is free of charge.

C6 Summary of evaluation results

Below are listed the results obtained after evaluating the measure indicators:

- an increased level of awareness: 66% in 2012 compared to 15% in 2009, which means that the campaigns organised to promote this measure generated positive results.

- citizens' sense of security level (acceptance indicator) when using bicycles as a means of transportation improved once the measure was implemented. The respondents perceive the Iasi urban area less dangerous for cyclists, with a decrease from 68% in 2009 to 59% in 2011 and 2012.

- the assessment of the average modal split showed that more people use soft modes of transport every day instead of private cars: the percentage of the respondents using public transport services doubled in 2012 compared to 2009; 19% of them used bicycles in 2012 compared to 8% in 2009; the percentage of private car users decreased by 4% in 2012 from 17% recorded in 2009.

- the average recorded number of people that use bicycles on the bicycle lane each day increased in 2012 to 148 compared to 111 recorded in 2011.

C7 Future activities relating to the measure

Iasi will continue maintaining the bicycle lane after the project ends. Records of the number of cyclists that use the lane will be kept for analysis. The city of Iasi plans to extend the bicycle lane by accessing European funding.

D Process Evaluation Findings

D0 Focused measure

0	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviation from the original plan

There were no deviations from the original plan.

D2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **5. Involvement, communication**: Insufficient involvement or awareness of (policy) key stakeholders.
- **5. Involvement, communication**: Conflict between key stakeholders due to diverging solutions as to which was appropriate.

Implementation phase

- **10. Technological, spatial**: Difficulties related to technical aspects and urban arrangement characteristics.

Operation phase

- No barriers.

D.2.2 Drivers

Preparation phase

- **1. Political/strategic**: The measure concerned is part of a city program and a consequence of the implementation of a sustainable vision.

Implementation phase

- **6. Positional**: Exchange of experiences and lessons learned with other measures or cities.

Operation phase

- **5. Involvement, communication**: Constructive and open consultation and involvement of citizens/users, positive response of citizens and stakeholders to the objectives of the measure.

D.2.3 Activities

Preparation phase

- **5. Involvement, communication**: Efforts to solve the conflict between key stakeholders due to diverging solutions as to which was appropriate.
- **5. Involvement, communication**: Consultation of target groups by meetings, face-to-face interviews or questionnaires, public awareness campaign about the sustainability problems to be solved, bringing together key stakeholders to discuss the sustainability problems to be solved (sharing different viewpoints).

Implementation phase

- **4. Problem related**: Thorough analysis of problems to be solved on sustainable mobility, activities to explain the pressure of the problems.
- **10. Technological, spatial**: Solve the technical problems and difficulties related to the urban arrangement.

Operation phase

- No activities.

D3 Participation of stakeholders

D3.1. Measure Partners

- **the Municipality of Iasi (Leading role)**
  - in charge with procurement documentation, tender and signing the contract with the construction company;
  - in charge with contracting a specialised marketing company and organizing bicycle-related promotional activities;
  - in charge with choosing the route of the bicycle lane;
  - in charge with organising bicycle contests;
  - in charge with organising educational meetings in high schools and universities
  - in charge with monitoring the distribution of promotional materials.

- **the construction company (Principle participant)** signed the contract and built 11 km of bicycle lane.

- **the Public Health Direction and Traffic Police (Occasional participants)**: participated in meetings held by the Municipality of Iasi in high schools and universities.

- **the Technical university (Occasional participant)**: organised surveys for the assessment of the measure.

D.3.2 Stakeholders

- **Students**: participated in meetings organised in schools and universities;
- **Citizens**: attended the events organised during the promotional campaigns;
- **Media**: broadcasted promotional activities.
- **Cyclists**: they benefit from proper infrastructure – a safe bicycle lane and parking facilities.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Transferability.** This measure can be replicated in any city in the EU because this mode of transport offers many advantages for the inhabitants of cities, as well as for the local authorities:
  - the physical condition improves due to the effort this activity requires, and so does the mental one, by diminishing the stress that busy traffic and the problem of free parking places bring;

- the number of private cars on the streets decreases, hence fewer traffic jams and improved traffic flow;
- the time required for reaching the destination may be shorter when cycling than when driving a car, because there are no traffic jams on bicycle lanes;
- cycling is a very cost-efficient means of transport;
- dedicated lanes for bicycles not only protect cyclists from traffic (there where the lanes are on the street), but also give them a feeling of security, which is very important, especially for those who consider taking up cycling.
- the level of pollution decreases with the reduction of the number of cars on the streets;
- cycling is also a pleasant and healthy way of spending one's spare time

- **Premises for success:**
  - to encourage people to use bicycles each time they can, since these are non-polluting means of transport;
  - the attractiveness of such a measure increases even more if bicycles are available to borrow or at least to rent for very small amounts of money;
  - the first areas for bicycle lanes to be created should be in the proximity of educational institutions or public institutions;
  - to link this measure to a part of a bigger development project of the city;
  - to get NGOs involved in promoting bicycle riding.

D4.2 Recommendations: Learning from the experiences of the measure

- **Promotion campaigns**. The promotion campaigns should be conceived so as to involve as many people as possible – contests are always a good way of attracting people, and so is the involvement of public people famous at local level;
- **Location-related difficulties.** Special attention should be paid to difficulties that may appear related to technical aspects and characteristics of the urban arrangement (roadway, pavement, green areas, etc.);
- **Technical solution.** One should consider whether asphalt or paving blocks should be used when constructing bicycle lanes.

ANNEX 1

http://www.ziaruldeiasi.ro/mozaic/cum-vad-vedetele-pista-de-biciclisti-de-laiasi~ni6mpq

Fig. A1 Positive article about the bicycle routes in Iasi – local newspaper

http://www.evz.ro/detalii/stiri/unica-pista-de-biciclete-din-iasi-inaugurata-oficial-906736.html

Fig. A2 Positive article about the bicycle routes in Iasi – national newspaper

A Facebook account was another source of information, a way to communicate effectively with young people and to share information and photographs from the events. On the Facebook account the campaign has 100 “friends”.

Fig. A3 The Facebook account

ANNEX 2

Questionnaire: "after" situation

M. 59 - Building cycle lanes in Iasi

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.

5. What is the means of transport you use in your daily trips (to work, school / college, shopping, etc..) the most:

□ private car □ bicycle □ public transport □ I prefer walking □ other _____

6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____

7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know

8. Does one of the CIVITAS measures applied in Iasi stipulate the creation of a bicycle lane along certain streets in the area of the Tudor Vladimirescu campus?
   □ yes □ no □ I don't know

9. Which route or which area do you consider the most appropriate for cycling in Iasi?
   □ Copou □ the historic centre □ the University campus
   □ Other route/area _____.

10. Please assign a grade to the following aspects of the city of Iasi on scale from 1 to 10:

	GRADE
Iasi – bicycle city	
Safety of cyclists on the streets of Iasi	
Drivers' behaviour towards cyclists	
The way in which people in Iasi are encouraged to use bicycles	

11. Are there any bicycle lanes and special areas dedicated to cycling enthusiasts in Iasi?
    □ yes □ no □ I don't know □ not interested

12. To what extent do you agree with the following statements - (within a scale from 1 to 5, where 1 means "total disagreement" and 5 "total agreement"):

Is cycling good for health?	1 2 3 4 5
If there were bicycle lanes in Iasi, would you use a bicycle for your daily trips?	1 2 3 4 5
Is the city a dangerous place for cyclists?	1 2 3 4 5
If more people used bicycles for their daily trips, would Iasi be a less polluted city?	1 2 3 4 5
Would building a bicycle lane mean more safety for cyclists?	1 2 3 4 5

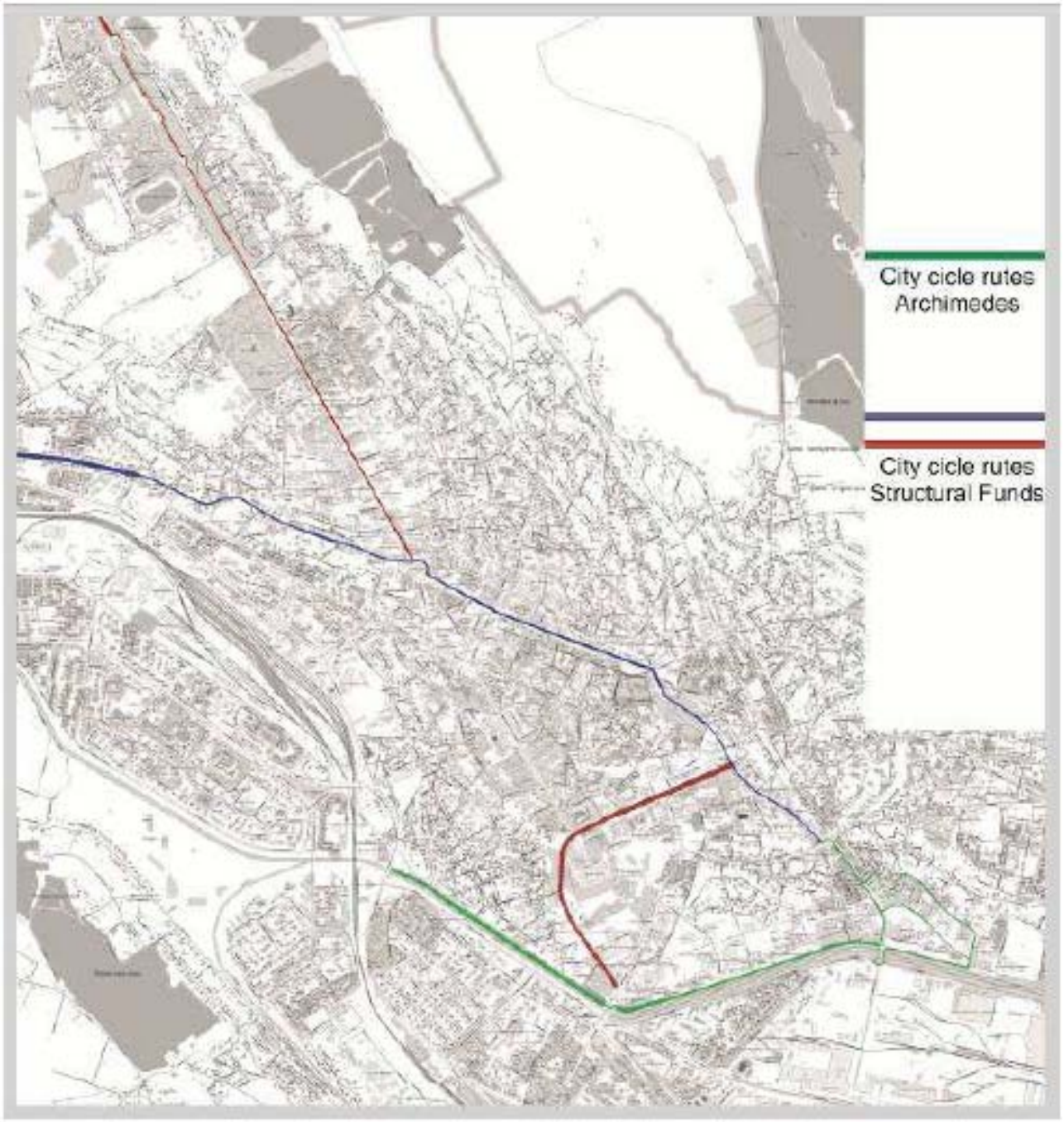
Do drivers show little respect to cyclists in traffic and pay very little attention to them?	1 2 3 4 5

13. To what extent do you agree with the following statements (please give a grade from 1 to 5, where 1 means "total disagreement" and 5 "total agreement"):

People in Iasi use bicycles more intensively than in other cities	1 2 3 4 5
There is a culture and a tradition of cycling in Romania just like in other countries	1 2 3 4 5
The City Hall of Iasi should extend the number of centres with bicycles for rent	1 2 3 4 5
The creation of bicycle lanes would make the already congested traffic even more difficult	1 2 3 4 5

14. Would you encourage a friend who is visiting Iasi to use the bicycle as a means of transportation for getting to know the city?
    □ yes □ no □ I don't know

ANNEX 3
Proposals for Further Cycle Lanes



Executive summary

Within the last years, the city's traffic has become more crowded due to an increased number of personal cars but also due to a non-organised movement of freight vehicles. Therefore, the Municipality of Iasi organised several meetings with owners of businesses located along the CIVITAS corridor to discuss some new strategies regarding their supplying and distribution activities. After a negotiation process, the Municipality of Iasi signed partnerships with several business owners, through which the above-mentioned activities were allowed to be performed only within certain time windows, of course during off-peak hours. In exchange, business owners have been given facilities like: fees and taxes exemptions/reductions; free parking access for the vehicles performing supplying/distribution activities, parking spaces placed near the companies' headquarters; building new parking spaces and allowing goods distribution vehicles to stop on the sidewalk in order to perform their supplying activities; special payment for night shifts, financially sustained by local authorities.

For the evaluation of this measure several indicators were determined by several methods:

- Surveys were conducted for assessing the indicators related to awareness and acceptance. The results showed:
  - an increased percentage of the awareness level: 89% in 2009, and 85% in 2012.
  - that the acceptance level indicator had an increasing tendency, from 77% in 2009 to 90% in 2012.

- The freight vehicles moving along the corridor were counted during peak hours and off peak hours. We noticed that the number of goods distribution vehicles decreased at peak hours after the measure was implemented, from 109 vehicles in 2009 to 41 in 2011 and to 33 in 2012. During off-peak hours the number of goods distribution vehicles increased from 17 in 2009 to 82 in 2011 and to 78 in 2012.

- The air quality measurement, which was performed in four different locations along the CIVITAS corridor, revealed that the NO_2 level decreased in all four places after the measure was implemented. The CO level decreased as well, but only in three of the four places, in the Tudor Vladimirescu area this level recording an increased value in the years after the measure was implemented.

The following can be regarded as lessons that were learned during the implementation of this measure:

- A condition for the success of this type of measure is the elaboration of an optimal strategy for the distribution of goods, including an accurate analysis to determine requirements for the implementation of the measure through a previously made study of stakeholders' profiles
- Efforts in order to involve the stakeholders – through meetings, discussions and negotiations for achieving consensus between partners – and to create partnerships are necessary for the implementation of the designed strategy.

The implementation of the measure opens new perspectives in approaching the traffic issue in big cities, where its flow needs consderable improvement, with direct implications on the air quality in the urban area.

IAS 66 – Efficient goods distribution in Iasi

A Introduction

A1 Objectives an target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To reduce emissions generated by freight vehicles.

(B) Strategic level:

- To establish a goods distribution plan to be maintained in the following years.

(C) Measure level:

- To conduct a survey on efficient goods distribution.
- To achieve and implement a strategy concerning the improvement of urban distribution of goods.
- To reduce the number of freight vehicles running during daytime.

A1.2 Target groups

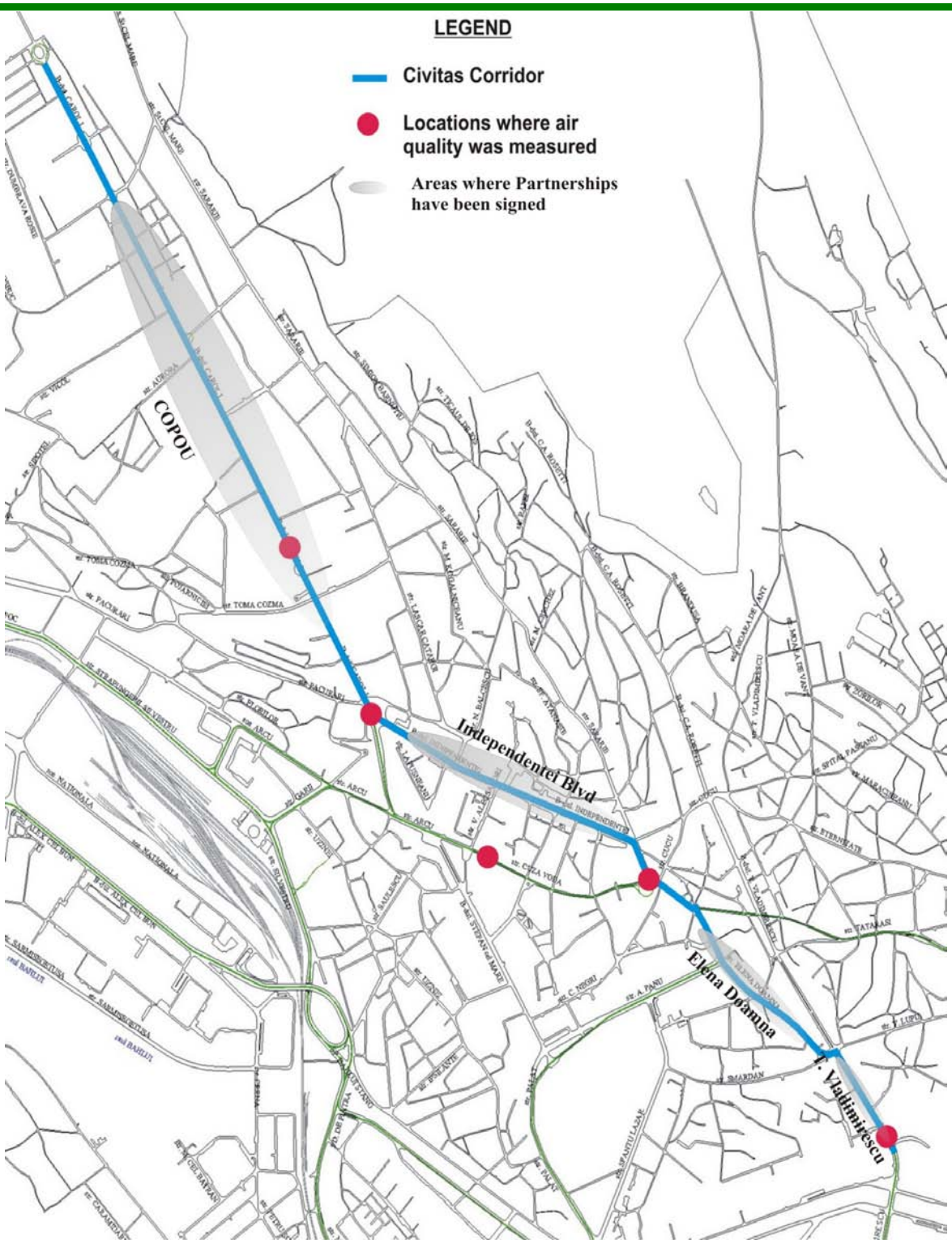
- All the freight vehicles that distribute goods along the CIVITAS corridor.
- Business owners (stores, kiosks, restaurants, pharmacies), drivers, etc.

A2 Description

The distribution of goods has improved along the CIVITAS corridor, which is marked in blue on Map 1 below.

The following steps were taken for the implementation of this measure:

- The Municipality of Iasi organised public consulting sessions
- Debates were organised between Municipality and business owners to discuss the goods distribution plan while taking into account all the factors that may influence the plan (behaviour of beneficiaries, economic crisis, companies' location, etc.)
- The goods distribution plan was then finalised based on the study of the efficient distribution of goods
- The written approval of the Municipal Traffic Commission was obtained, and, consequently, the access of vehicles that ensure the supplying activities performed by economic operators was restricted; the supplying activities are prohibited within the time windows: 7.00-9.00 a.m. and 3.00 -5.00 p.m.



Map 1 – Areas where Freight Quality Partnerships were signed with business owners

A3 Person in charge for evaluation of this measure

Names of persons	Luminita Nazare - implementation
	Cristian Stoica - evaluation
Name of organization	Iasi, PTI
Direct telephone	+40741027068, +40722229502
e-mail	lumina_strategii@yahoo.com, dir_tehnic@ratp-iasi.ro

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New mode of transport exploited** – the implementation of a goods distribution plan has reduced HGV traffic and the associated emissions in the city centre.
- **Targeting specific user groups –** business owners on the CIVITAS corridor.
- **New organizational arrangements or relationships** – a Freight Quality Partnership with key stakeholders was built.

B2 Planning of Research and Technology Development Tasks

In order to set up the goods distribution plan a four-step study was made:

- the requirements and behavior of the stakeholders were analysed.
- the results of the meetings with the stakeholders helped develop a plan for the improvement of the distribution of goods.
- specific regulations were adopted to legalise the access control measures.

B3 Situation before CIVITAS

Previously, the companies along the CIVITAS corridor were not supplied according to a schedule made at the city level or at the area level. This generated high HGV traffic, especially during peak hours, with direct impliciations on air quality.

There were no special restrictions in traffic for supply vehicles; the only restrictions were due to the bad infrastructure in some areas (weight limit restrictions in order to protect the infrastructure). The intensive traffic especially during peak hours, which resulted in traffic congestions, brought the necessity of the implementation of a plan for the distribution of goods.

B4 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Study regarding an efficient distribution of goods (*September 2009***)** – the conclusions of the study "Efficient Goods Distribution in Iasi" highlighted the lack of good quality data about the distribution of goods in the city and the need to update the supply/distribution schedules so as to perform these activities within off-peak traffic hours.

Stage 2: Restricted access for animals and vehicles (*September 2009***) –** Local Council Decision no. 418/September 29, 2009 denied the access of animal-drawn vehicles, and of machinery used for construction, agricultural or forestry works within the boundaries of Iasi.

Stage 3: Parking restriction (*May 2010*) – Local Council Decision no. 153/2010, it is forbidden parking for the following vehicles within Iasi's on public domain: vehicles or vehicle assemblies (i.e. including a trailer) of over 5.2 m in length,; trailers that are not linked to motor the vehicles;, tractors used within agricultural and forest exploitation;, vehicles used for services orand miscellaneous tasks (for example e.g. special vehicles for funeral services). These categories of vehicles can now only be legally parked only oin special places belonging to their owners or to their authoriszed users.

Stage 4: Restricted access within certain hours (*August 2010*) – Local Council Decision no. 75822 issued on August 24, 2010 by the Municipal Traffic Commission prohibited the circulation of distribution vehicles within 7.00 - 9.00 and 15.00 - 17.00.

Stage 5: Establishing partnerships (*August 2010*) – The meetings with the representatives of businesses located on the CIVITAS corridor led to the signing of 59 partnership agreements, which were divided on groups of operators according to their current distribution practices, location and reaction to negotiations.

Stage 6: Evaluation (*November 2009, February 2011 and February 2012*) – surveys were organised to assess the impact of the measure, and goods distribution vehicles were counted during the same periods.

Starting from the inappropriate legal framework for distribution of goods within the city and from the disorganised way of distribution, and taking into account the results of the study "Efficient Goods Distribution in Iasi", an Urban Goods Distribution Improvement Strategy for Iasi was made by the members of the ARCHIMEDES team within the Technical Department of the Municipality of Iasi.

A description of the study "Efficient Goods Distribution Plan in Iasi" is provided in Annex 1.

As part of the implementation of this study, the Municipality of Iasi signed 59 Freight Quality Partnerships with the main businesses in the area. The activities established by these partnerships are defined and described according to the measures proposed in the U*rban Goods Distribution Improvement Strategy for Iasi*, and are meant to reduce the level of traffic congestion and the pollutant emissions generated as consequence, especially in the city centre. Along this line special regulations have been adopted to restrict the access of goods vehicles in the area.

In the following sections we have summarised some of the modules of *The Urban Goods Distribution Improvement Strategy for Iasi*.

1. Users' Requirements

In the first phase of this measure, the conclusions of the study "Efficient Goods Distribution in Iasi" highlighted the lack of good quality data about the distribution of goods in the city and the need to update the supply/distribution schedules so as to perform these activities within off-peak traffic hours. In this context, particular attention was paid (according to the results obtained from traffic studies) to delivery schedules, which were set between 7.00-9.00 and 15.00-17.00. However, private businesses were not very interested in receiving the benefits that the Municipality of Iasi offered (e.g. tax exemption or reduction, and/or free parking for goods vehicles, parking places near the companies' headquarters, etc.). The reasons for this lack of interest were that the demands of business owners were higher than the benefits offered by the Municipality of Iasi, the inovative aspect of the measures (such actions had never been implemented before), the financial crisis, which had made business owners more reluctant to changes.

However, for the companies that had initially refused this proposal, solutions have been found to their everyday problems (since more than a quarter of the companies were affected by the insufficient parking space or by the difficult access for goods vehicles within their private grounds, the most important improvement for them was they were granted easier access for goods vehicles within their private areas).

A special workgroup composed of businesses, politicians and technicians has been set up to monitor and promote these activities.

2. Leadership and Coordination

Goods distribution in Iasi became the object of administrative coordination provided by the Municipality of Iasi through efficient cooperation among its departments, and also through active collaboration with other institutions involved in this process. The beneficiaries are the businesses active within the city's area, and the coordination entity – the Technical Department of the Iasi City Hall – collaborates closely with them, maintaining a permanent exchange of information.

An active strategy for goods distribution was accepted as being an important part of city's transport system. This goal was achieved through the involvement of political leaders of the city, the Mayor and members of Iasi Local Council, in the important actions planned to sustain goods distribution activities. Also, these actions were introduced within strategic plans and urban development projects, with prior approval of specialized commissions, based on the Urban Goods Distribution Improvement Strategy for Iasi.

The collection of data and information regarding goods distribution activities performed in Iasi are necessary for an appropriate examination of the entire phenomenon, so as to find solutions to increase their efficiency. The data collection activity, building on the initial study conducted in 2009, was carried out by two departments of the Municipality of Iasi: the Department of Statistics and the Technical Department, both maintaining permanent feedback.

3. Goods Distribution Policies

Firstly, the City administration had to consider the legal regulations adopted in order to restrict the access of vehicles in Iasi. Therefore, a Local Council Decision was issued by Iasi City Council - HCL no. 418 / 29 September 2009, for traffic organization in Iasi. This decision forbids access by and passing of animal traction vehicles, auto-propelled vehicles used within construction works, agricultural machineries or forestry vehicles, and establish the rules to place signs specifying the penalties that will be applied if the above mentioned rules are not respected). This local Council Decision makes reference to goods distribution actions, taking into account that some of these vehicles, at certain times, ensure the supply of construction materials or agricultural products. Subsequently, Iasi City Council issued Decision no. 153/2010, which is intended to provide the specification for the vehicle parking controls in Iasi. According to this regulation it is forbidden for the following vehicles to park within Iasi's public domain:

• vehicles or vehicle assemblies (i.e. including a trailer) of over 5.2 m in length,
• trailers that are not linked to the vehicles,
• tractors used within agricultural and forest exploitation
• vehicles used for services or miscellaneous tasks (for example special vehicles for funeral services)

These vehicle categories can now only be legally parked on special places belonging to their owners or their authorized users.

Local Council Decision no. 75822 issued on 24th August 2010 by the Municipal Traffic Commission prohibits the circulation of vehicles that deliver to businesses within 7.00 - 9.00 and 15.00 - 17.00.

Once the economic context in Iasi has revived, Iasi Municipality proposed that these activities should be performed in the afternoon, after the working schedule of the institutions ends (after 5.00 pm). The goal is to maintain a better organization of the city traffic, reducing vehicle congestion within peak periods of the day by reducing the number of goods vehicles on the roads at these times, therefore allowing a fluent traffic and also reducing the conflict for parking spaces between goods vehicles and cars.

4. Infrastructure

To sustain efficient traffic safety it is absolutely necessary to install special signs and markings for traffic restriction (speed or weight restrictions). As a consequence, this activity was performed through the coordination of the Municipality's Technical Department collaborating with the Municipal Traffic Committee and Community Police.

Good exploitation of the road infrastructure must be monitored through a traffic management system, coordinated by specialists from the Technical Department of the Municipality of Iasi. There is a new traffic management project submitted to European Commission that presents a special section for goods distribution. This project describes the traffic management system and makes also reference to traffic access restriction rules, to parking management within different city areas, including the CIVITAS corridor.

Special attention has been paid to parking infrastructure and to its effective usage. Thus, according to the demands issued by businesses, the following special measures have been adopted, in order to make goods distribution activities more efficient:
• offering free parking access for the vehicles performing supplying/distribution activities,
• parking spaces placed near companies' headquarters,
• building new parking spaces
• allowing goods distribution vehicles to stop on the sidewalk to perform their supplying activities at specific times of day and for limited durations, with access being granted only for certain vehicle categories, and fully taking into account the responsibility needed for respecting the special conditions associated with sharing pedestrian space. The Community Police monitored these activities and checked if the traffic access restriction rules and parking conventions have been respected.

5. Information and Educational Campaigns
The main means used to inform all business owners on the CIVITAS corridor about the Urban Goods Distribution Improvement Strategy are press releases and specialized websites, administrated by the public rransport company and the Municipality of Iasi.

The informative activities mentioned in the Strategy, aim at displaying posters within the main areas of the city, presenting useful information for businesses, leading to the organization of informative meetings, with the participation of businesses.

6. Freight Quality Partnership
Eleven meetings held with business owners have led to the idea of a partnership agreement, divided on groups of operators, according to their current distribution practices, location and reaction to negotiations meant to identify an Urban Goods Distribution Improvement Strategy for Iasi. The facilities chosen by companies are: fees and taxes exemptions / reductions; free parking access for the vehicles performing supplying/distribution activities, parking spaces placed near companies' headquarters; building new parking spaces and allowing goods distribution vehicles to stop on the sidewalk as to perform their supplying activities; special payment for night shifts, financially sustained by local authorities.

In conclusion, 59 partnerships have been signed with different groups of businesses, these agreements containing restrictions and facilities awarded to each group category (see Map 1 above).

Copou area
The first group of businesses is represented by companies operating in the Copou area. The Municipality of Iasi organized 2 negotiation meetings in October 2010 – January 2011, attended by 21 business owners. As a result 15 partnership agreements were signed. In this case, the solution adopted was to provide proper parking facilities on the sidewalk or to build special traffic cells to be used for parking and for distribution and supply activities. The time schedule adopted for supply-distribution activities is 6 pm - 10 pm.

Independentei Boulevard area
Within September 2010 and February 2011, the Municipality of Iasi held 4 meetings attended by 50 business owners in the area. After negotiations, 30 partnership agreements were signed. The solutions adopted for these stores were to create access ramps to be used for their supply and distribution activities, ramps placed on the right part of the sidewalk leading to Copou, because the pedestrian flow is lower on this side, and also to build parking cells on the left part of the sidewalk. For kiosks, except

the access ramps, the goods distribution vehicles were allowed to park on the first traffic lane and, in some cases, special access paths were created in front of the kiosk. The time schedules adopted for these businesses are set between 6 pm and 10 pm for stores and within 8 pm - 10 pm for kiosks.

Elena Doamna area

Two negotiation meeting were held with 4 business owners within October 2010 – January 2011. Three partnership agreements were signed. For supply–distribution activities, performed by within this area, goods vehicles were allowed to be parked on the first traffic lane and, in some cases, special access paths were created in front of the kiosks. The time schedule established for these activities is set within 6 pm -10 pm.

Tudor Vladimirescu area

In this area, within September 2010 – January 2011, Iasi organized 2 negotiation meetings with 21 business owners after which 11 partnership agreements were signed. For the eleven businesses performing on Tudor Vladimirescu area, parking spaces were created to ensure their supply–distribution activities, set within the time schedule 6 pm -10 pm.

Posters were displayed in key areas of the city, also presenting the necessary information to businesses. Moreover, 5 informative meetings were organized with all potential business owners performing within the area.

Fig. 1 Poster – Efficient Goods Distribution in Iasi

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure IAS 22-Access control to a historic centre** – the historic centre is part of the area in which the goods distribution plan will be implemented
- **Measure AAL63- Efficient goods distribution in Aalborg, BH 64-Efficient goods distribution in Brighton & Hove, DSS 65-Efficient goods distribution in Donostia-San Sebastian** – the same measure was implemented in these 3 cities, which is a good opportunity to exchange experience.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impact and indicators

C1.1.0 Scope of the impact

The scope of this measure is to establish a plan for distribution of goods.

The implementation of this measure may have an economic impact on the companies who perform supply and distribution activities. Carrying these activities in a certain interval, when roads are more accessible, may reduce fuel consumption.

The environment and transport system impact results from reduction of the number of fright vehicles, which means less pollutant emissions and more fluent road traffic.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ENVIRONMENT					
5		**Pollution/Nuisance**	Air Quality	CO levels	CO concentration	Ppm or g/m3, quantitative, measurement
6				NO2 levels	NO2 concentration	Ppm or g/m3, quantitative, measurement
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Survey	Index (%)
14			Acceptance	Acceptance level	Survey	Index (%)
	TRANSPORT					
25			Freight Movements	Goods vehicles moving in demo areas	Daily number of goods vehicles moving in area	Number

C1.1.2 Methods for evaluation of indicators

No.	Indicator	Target Value	Source of Data and Methods	Frequency of Data Collection
5	CO levels	Decreased	The measurements of the air quality have been performed within Measure 5. It is impossible for us to determine how the percentage of reduced CO levels is due to the implementation of this measure.	Before - December 2009 After – June 2011 and June 2012
6	NO2 levels	Decreased	The measurements of the air quality will be made within Measure 5. It is impossible for us to determine how the percentage of reduced NO_2 levels is due to the implementation of this measure.	
13	Awareness level	Increased	The face- to -face interviews* were carried out by students in four areas on the CIVITAS corridor (see Map 1) during five days. 100 people (an equal number of drivers, freight operators and shopkeepers) were interviewed in each of these three years. **November 2009.** To asses the awareness level, the respondents were asked how they rate the idea, on a 5 point scale, that through the ARCHIMEDES project, a Partnership for Quality Goods Distribution was to be signed with the main business owners placed along CIVITAS corridor and based on this Partnership an Urban Goods Distribution Improvement Strategy was to be defined, which would bring about reduction of heavy traffic and pollutant emissions along this corridor. For the acceptance indicator, the respondents were asked to answer on a 5 point scale if they agreed that: city traffic wass very congested due to city's economical development; goods distribution vehicles contributed to this congested traffic and to high pollution level; business owners should use environmentally-friendly goods distribution vehicles, etc. **February 2011 and February 2012.** To assess the awareness level, the same questions were asked, but they were adapted to the stage the task was in (already implemented). For the assessment of the acceptance level indicator, we asked the respondents to answer, on a 5 point scale, if they agreed that: city traffic is very congested due to city's economical development; Urban Goods Distribution Improvement Strategy implemented in Iasi result in a city less traffic congested and less pollutant emissions; this strategy must be extended to other commercial areas.	Before – November 2009 After – February 2011 and February 2012
14	Acceptance level	Increased		
25	Freight Movements	Decreased during the day time as a result of a better supplying schedule	The goods vehicles on the CIVITAS corridor were counted.	

* The questionnaire is to be found in Annex 2.

C1.1.3 Planning of before and after data collection

Evaluation Task	Indicators Involved	Completed By (Date)	Responsible Organisation And Person
Baseline data collection	All	M15	Iasi, TUI
Collection of after data	All	M30, M42	Iasi, TUI
D12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

We use the year 2009 as a baseline year to compare the evolution of the indicators below.

For the evaluation process of the Urban Goods Distribution Improvement Strategy in Iasi we analysed:

- the awareness level and acceptance level indicators, which were obtained through surveys, and were assessed by comparing the results of these surveys before and after the measure were implemented.

  The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

  The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people - an equal number of drivers, freight operators and shopkeepers) after the measure has been implemented, thus making it possible to compare the results of the "before" and the two "after" situations. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

  The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

  The interviews were carried out in the same 4 areas (see Map 1) during the three periods the surveys took place in (once before and twice after the implementation of the measure). We are aware of the small sample size and of the fact that the results reflect only the situation of those particular areas and are influenced only by the persons and conditions there.

- Air quality measurements were carried out by a specialized company in order to determine the level of some emissions (CO, NO_2), in four locations along the CIVITAS corridor, before and after the measure implementation. These measurements are part of the *Study of emission levels* from IAS 5 - LPG buses.
- Freight movements by counting the number of the goods distribution vehicles in traffic.

C1.3 Methods for Business as Usual scenario

Currently, the city centre is very crowded, being crossed over by many personal cars, business cars, freight vehicles, and public transport vehicles. This has a negative impact on quality of air, traffic movement and on the citizens. Without measures to regulate the distribution of goods, the situation is expected to worsen over the years.

C2 Measure results

C2.1 Environment

Air quality was measured by a specialised company in 4 locations on the CIVITAS corridor.
The measurements were made in bus stops using authorised devices, at 1.5 m above ground. All air quality measurements were made in bus stops along the CIVITAS corridor in one day. Six samples were collected for each emission type (CO, NO_2), three during the day and three during the night, and the results that were used in the evaluation process were their arithmetic mean for each type of emission.

Table C2.1.1: Air quality

Indicator	Location	Before (2009)		After (2011)		After (2012)	
		12a.m.-2.30 p.m	23p.m.-0.45a.m	12a.m.-2.30 p.m	23p.m.-0.45a.m	12a.m.-2.30 p.m	23p.m.-0.45a.m
5, CO levels (mg/m^3)	Tudor Vladimirescu	1,667	1,267	1,823	1,296	1,798	1,28
	Tg. Cucu	2,067	1,533	1,999	1,389	1,98	1,303
	Casa de Cultura a studentilor	2,067	1,267	1,968	1,195	1,927	1,109
	Univ. Al. I. Cuza	1,900	1,367	1,789	1,297	1,634	1,224
6, NO_2 levels (mg/m^3)	Tudor Vladimirescu	2,490	1,800	2,350	1,680	2,27	1,618
	Tg. Cucu	2,110	1,840	2,010	1,750	1,943	1,69
	Casa de Cultura a studentilor	2,930	2,070	2,810	1,950	2,74	1,9
	Univ. Al. I. Cuza	2,250	1,300	2,110	1,230	2,1	1,21

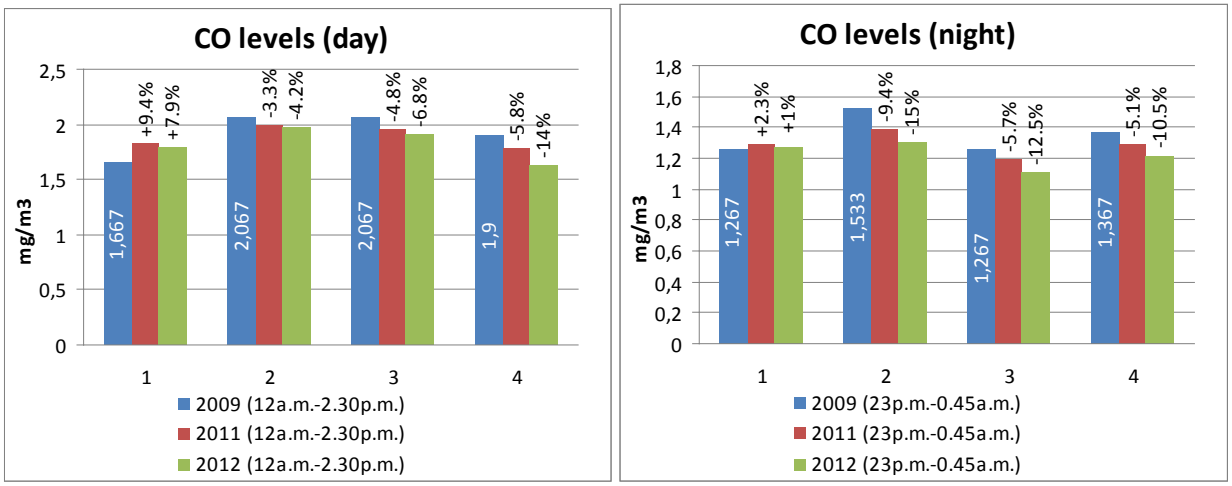


Fig. 2 CO levels (mg/m^3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia Monastery – bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University (bus stop)

On looking at the evolution of CO level during the day and the night, before and after implementation phase, we notice that this level decreased in 3 places, and that the maximum reduction was recorded, during the day in Al. I. Cuza University area – it was 14% lower in 2012 compared to the value of 1.9 mg/m^3 measured in 2009 and during the night, in Tg. Cucului area, and 15% lower in 2012 compared to the value of 1.533 mg/m^3 measured in 2009. In Tudor Vladimirescu area, the level of CO increased over 9% in 2011 and over 7% in 2012 compared to the value of 1.667 mg/m^3 recorded in 2009. A possible reason is that this area is located at one end of the CIVITAS corridor where many warehouses, a mall and other stores are concentrated. The same increase tendency was reorded also during the night.

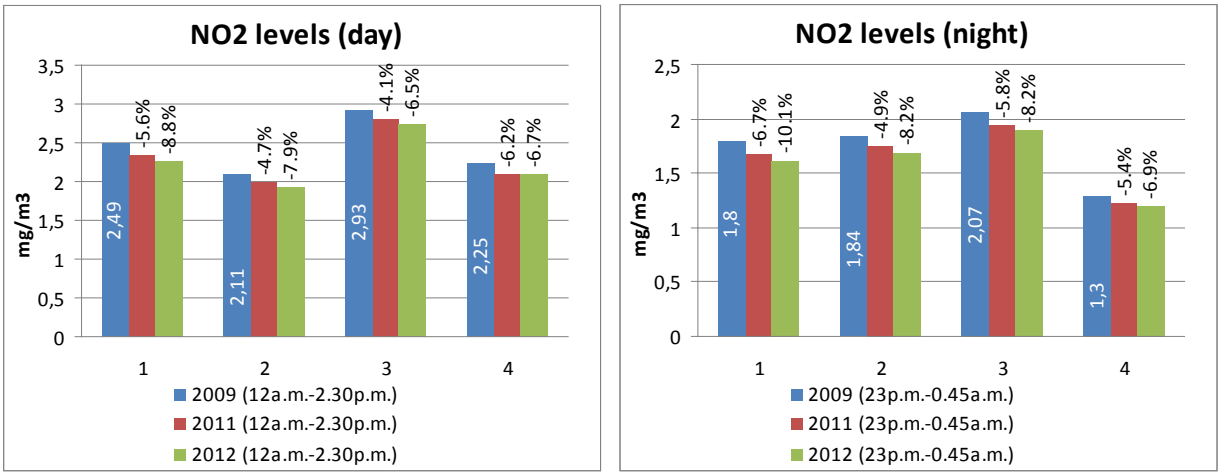


Fig. 3 NO_2 (mg/m_3) measured in: 1 - Tudor Vladimirescu (bus stop); 2 - Tg. Cucului (Golia monastery – bus stop); 3 - Students' Culture House (bus stop); 4 - Al. I. Cuza University (bus stop)

Analyzing NO_2 level on all 4 places, we see that this level decreases both during the day and the night, the maximum value being recorded in Tudor Vladimirescu area, over 8% during the day and over 10% during the night. The minimum reduction was recorded: during the day, in Students' Culture House area, with 6.5% lower in 2012 compared to the value of 2.93 mg/m^3 measured in 2009 and during the night, in Al. I. Cuza University area, with 6.9% lower in 2012 compared to the value of 1.3 mg/m^3 recorded in 2009.

C2.2 Transport

Table C2.2.1: Freight Movements

Indicator	Time Intervals	Before (2009)
25, Freight Movements	7a.m.-9a.m.	62
	10a.m.-12a.m.	17
	3p.m.-5p.m.	47

Indicator	Time Intervals	After (2011)	After (2012)
25, Freight Movements	7a.m.-9a.m.	24	18
	8p.m.-10p.m.	82	78
	3p.m.-5p.m.	17	15

Indicator	Time Intervals	Difference: After (2011) – Before	Difference: After (2012) – Before
25, Freight Movements	7a.m.-9a.m.	- 38	- 44
	3p.m.-5p.m.	- 30	- 32

The data analysed were obtained by counting, and were recorded in one location on the Independentei Boulevard.

Before implementation we chose the time interval for off-peak hours between 10a.m.-12a.m. We did not know, at that time, that supply-distribution activities will be set, through the signed Partnership, at 8p.m.-10p.m.

Then, after the measure was implemented, we consider that is best to count the number of freight movements within 8p.m.-10p.m. because this time interval was set for this area, for performing supply-distribution activities by business owners. This time interval is also considered as being off peak hours.

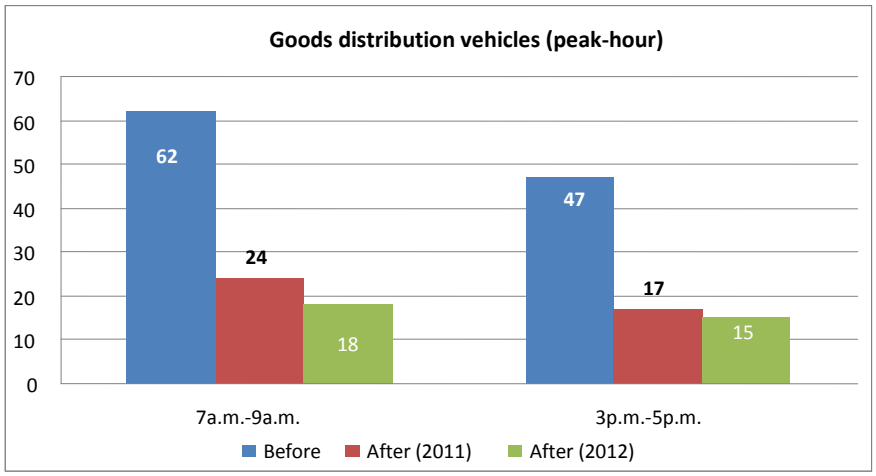


Fig. 4 Freight movements on peak hours

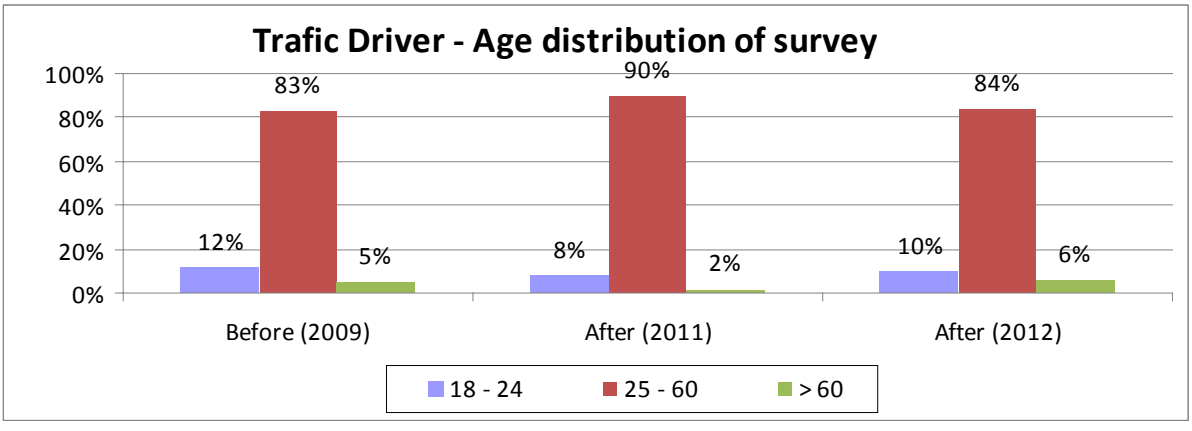
After counting the number of goods distribution vehicles, we noticed that, if in 2009, supplying-distribution activities were performed mainly within peak hours (7a.m.-9a.m. and 3p.m.-5p.m.), with 109 vehicles and with only 17 vehicles on off peak hours (10a.m.-12a.m.), after the partnership agreements were signed, these activities were performed mainly within the timeframe 8p.m.-10p.m., with 82 vehicles in 2011, and 78 vehicles in 2012, while on peak hours the number of goods distribution vehicles reduced to 41 in 2011 and 33 in 2012 (Fig. 4).

C2.3 Society

The students chosen to conduct the interviews, along the CIVITAS corridor, were trained to interview an equal number of: traffic drivers, freight operators and shopkeepers (100 people in total), in order to keep a balanced average of the opinions.

The interviews for assessing the awareness and acceptance indicators were taken in all of the four locations chosen and within the studied intervals.

In the tables below we are giving some details about the respondents, varying with the category that they are part of (Fig. 5, 6, 7).



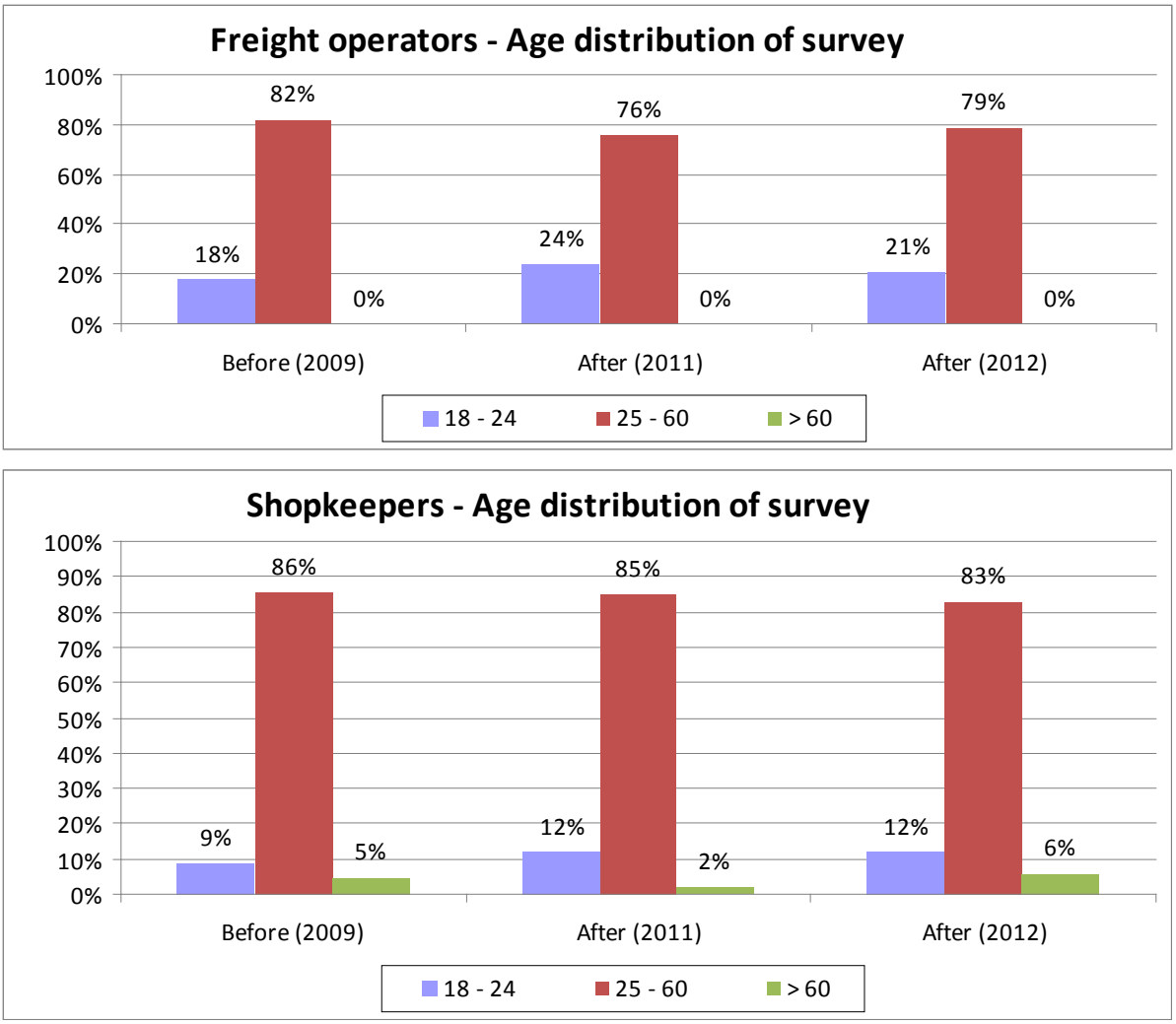
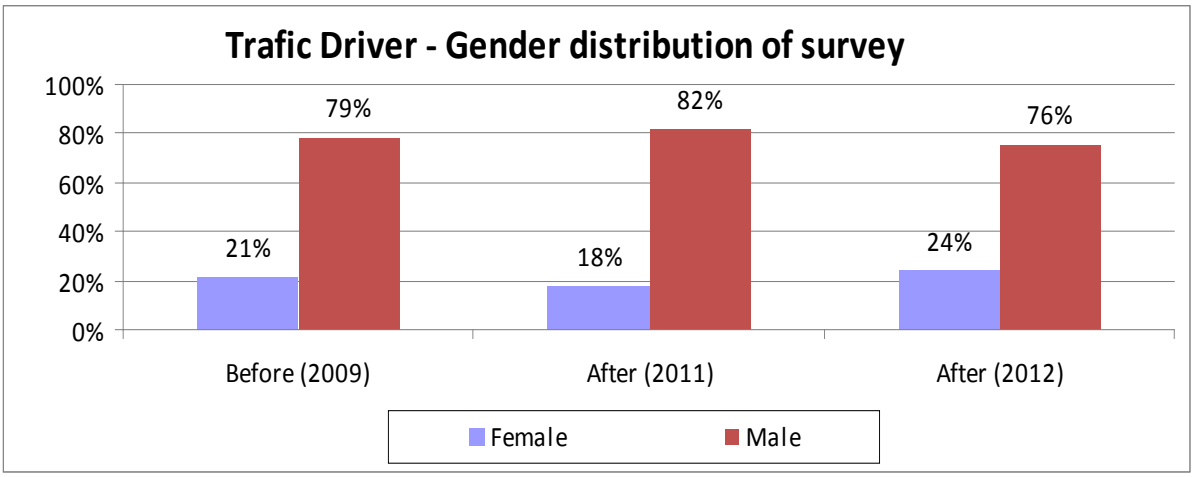
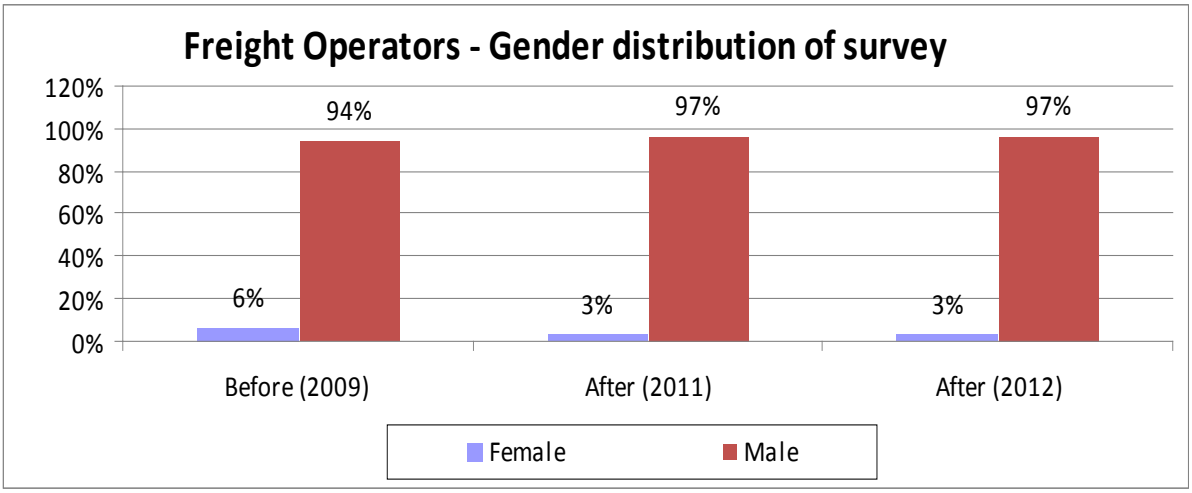


Fig. 5 Age distribution of suvey

Fig. 5 shows that the majority of the respondents, corresponding to all three categories, are between 25 and 60 years old.





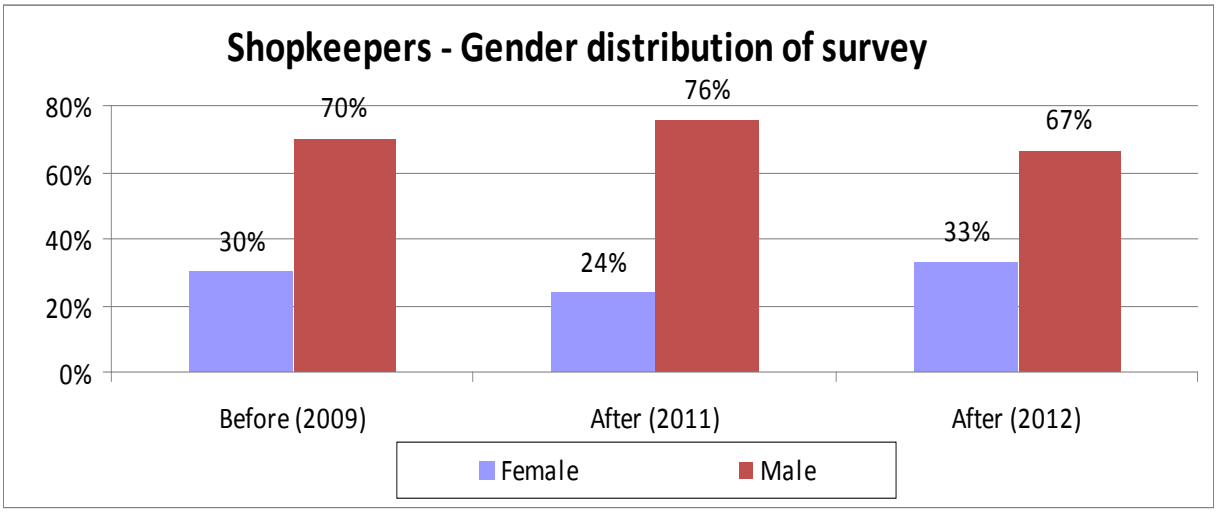
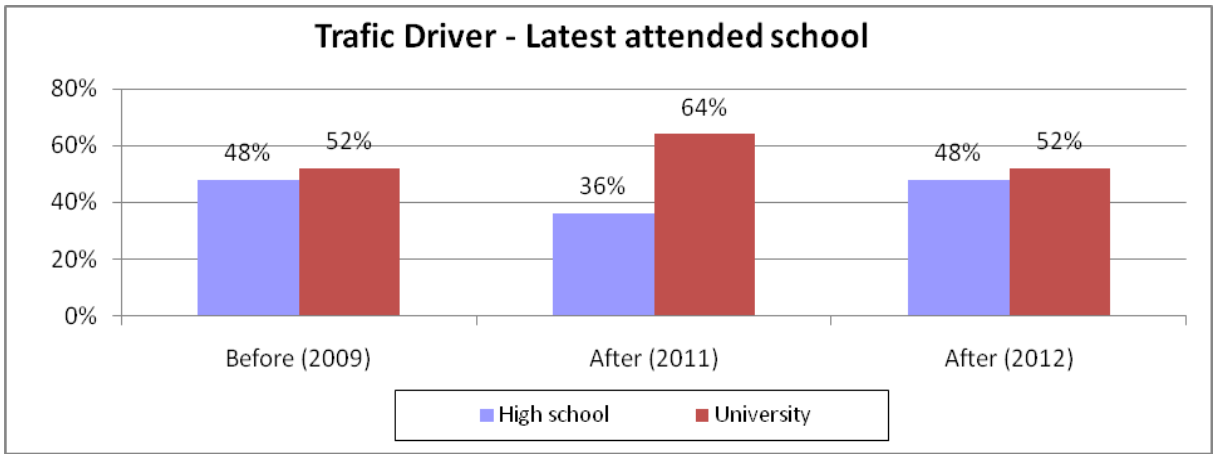
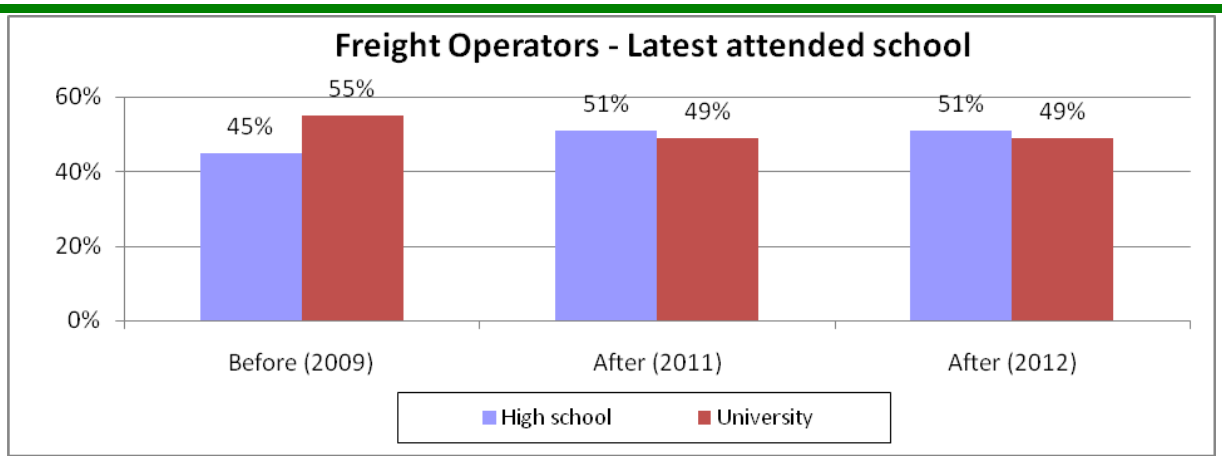


Fig. 6 Gender distribution of suvey

Fig. 6 shows that most of the respondents are male.





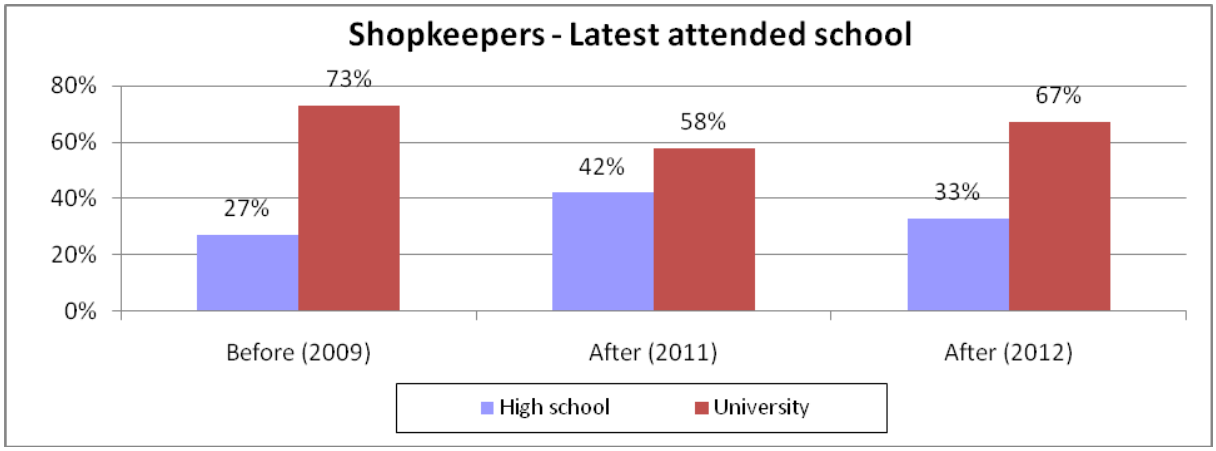


Fig. 7 Latest school attended distribution

Fig. 7 shows that:

- Drivers: while in the "before" situation (2009) and in the "after" situation from 2012 the levels of education were balanced (48% - high school and 52% - university), in the "after" situation from 2011 most of them had higher education (64%).
- Freight operators: while in the "before" situation 45% of them attended only the highschool and 55% had higher education, in the two "after" situations the two education levels were almost equally represented.
- Moat of the shopkeepers have higher education.

Table C2.3.1: Awareness

Indicator		Before (2009)	After (2011)	After (2012)
13. Awareness (%)	1. very good idea	46%	43%	46%
	2.	43%	40%	39%
	3.	8%	15%	11%
	4.	2%	1%	2%
	5. very bad idea	1%	1%	2%

For the evaluation of the awareness level indicator, the respondents were asked to express their opinion on a 5-point scale (where 1 means "very good idea" and 5 "very bad idea") on the following issues. The

statements were the same for each of the three situations, but they were adapted to the stage the task was in (already implemented):

- The partnership between the local authorities and the major distribution companies in order to reduce heavy vehicle traffic and emissions of harmful gases, especially downtown.

- The Urban Goods Distribution Improvement Strategy made to encourage economic development in a sustainable city without increasing pollution level.

Both the table above (C2.3.1) and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the five possible answers.

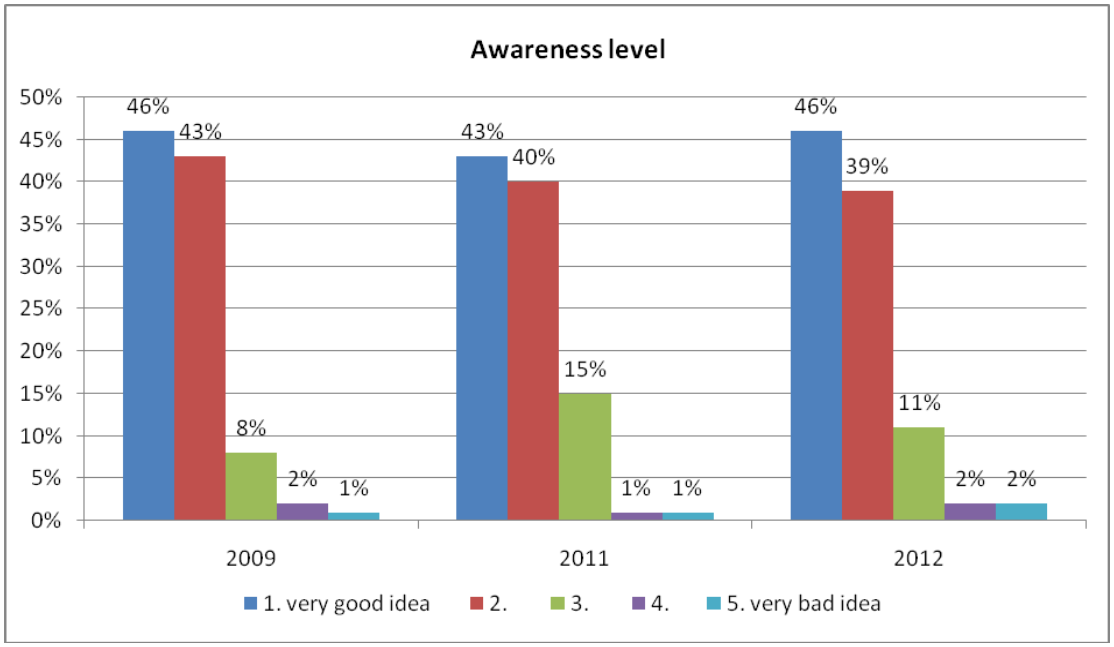


Fig. 8 Awareness level

Fig. 8 reveals that the idea of partnerships for Quality Goods Distribution remained a good one, even if the percentage of interviewed people who thinks that (points 1 and 2), decreased a little from 89% in 2009, to 83% in 2011 and 85% in 2012.

Table C2.3.2: Acceptance

Indicator		Before (2009)	After (2011)	After (2012)
14. Acceptance level (%)	1. total agreement	53%	86%	78%
	2.	24%	9%	12%
	3.	11%	4%	9%
	4	8%	0%	1%
	5.. total disagreement	4%	1%	0%

For the assessment of the acceptance level indicator, the respondents were asked if they agreed to the following:

- Traffic congestion is a consequence of the economic development of Iasi in the last period.
- The high number of commercial vehicles contributes greatly to pollution in Iasi.
- Businesses, shops, commercial activities in the city should use vehicles with low levels of emissions

Both the table above (C2.3.2) and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the three questions for each of the five levels of agreement.

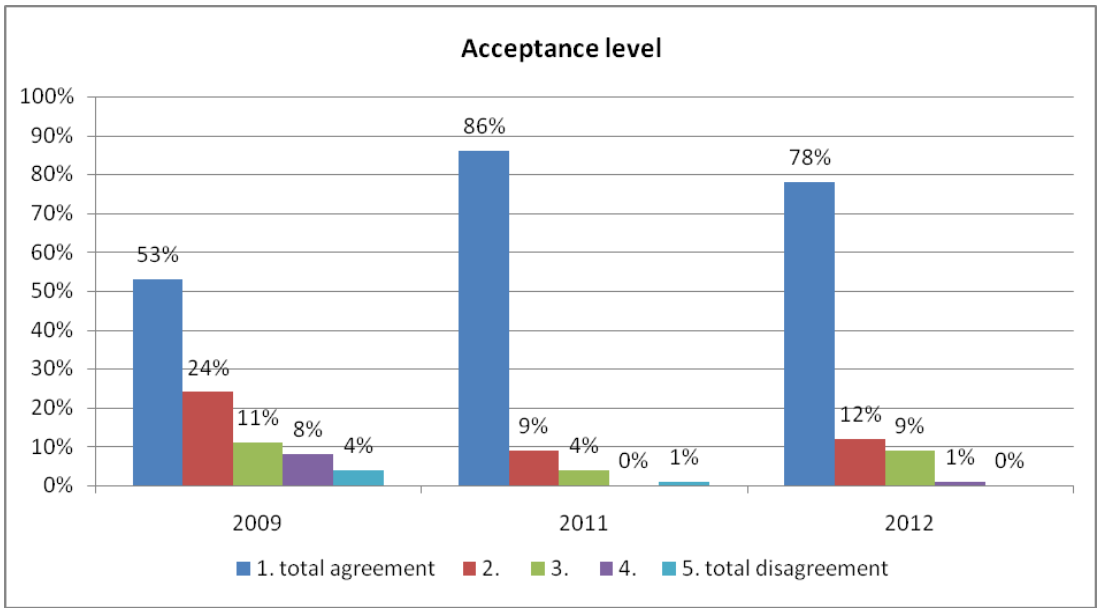


Fig. 9 Acceptance level

Figure 9 shows that most of the respondents – 77% in 2009 and 90% in 2012 (points 1 and 2) – agree that the economical development of the city led to more busy traffic, the large number of goods vehicles contribute to the increase of pollution, and that businesses and shops should use vehicles with low levels of emissions.

Other feedback received through surveys revealed that a high percentage of freight vehicle' drivers, shopkeepers, etc. are aware that goods distribution vehicles are not so environmentally-friendly. The reasons are related to vehicle emissions standards and performing a non eco drive.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To develop an Urban Goods Distribution Improvement Strategy	★★
2	To sign Freight Quality Partnerships	★★
NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%) ★★ = Achieved in full ★★★ = Exceeded		

C4 Upscaling of results

A strategic goods distribution plan can be elaborated and applied in many areas in the city where large companies are located, companies which sales different goods.

C5 Appraisal of evaluation approach

The assessment process involved the follow up of the evolution of the indicators set for this measure:

- awareness level and acceptance level – through survey.
- CO level and NO_2 level – through measurement.
- Freight movements – through counting.

Regarding evaluation, the difficult part is to determine what percentage of reduced CO and NO_2 levels is due to implementing this measure. Evolution of indicators (emissions) is a result of the action of several factors, which can be CIVITAS-related (implementation of other project measures) or factors not related to the CIVITAS project.

C6 Summary of evaluation results

Analyzing the results obtained from surveys and counts, we can summarize that:

- CO level decreased in 3 of 4 places, with the maximum reduction of 14%, recorded during the day, in 2012 compared to 2009, within Al. I. Cuza University area, and during the night, within Tg. Cucului area, CO level is lower with 15% in 2012 than in 2009. An increase value of CO level recorded only in Tudor Vladimirescu area both during the day and the night.
- NO_2 level, measured at all 4 places, showed a decrease tendency, the maximum value being recorded in Tudor Vladimirescu area, over 8% during the day and over 10% during the night. The minimum reduction was recorded: during the day, in Students' Culture House area, 6.5% lower in 2012 compared to 2009, and during the night, in Al. I. Cuza University area, 6.9% lower in 2012 than in 2009.
- the number of freight movements decreased at peak hours after the measure was implemented, from 109 vehicles in 2009, to 41 in 2011 and 33 in 2012. In off-peak hours, the number of goods distribution vehicles increased from 17 in 2009 to 82 in 2011 and to 78 in 2012.
- the awareness level, assessed through surveys, revealed an increased percentage: 89% in 2009, 83% in 2011, and 85% in 2012.
- the acceptance level evaluation also showed an increased percentage of acceptance among interviewees: 77% in 2009 and 90% in 2012.

C7 Future activities relating to the measure

Iasi will continue to maintain the partnerships signed with different businesses along CIVITAS corridor and will ensure that the time schedules approved for supplying activity are respected. In addition, Iasi will try to sign partnerships with companies placed on other corridors within the city.

D Process Evaluation Findings

D0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviations from the original plan

There were no deviations from the original plan regarding the implementation phase of the measure.

D2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **5. Involvement, communication**: Insufficient awareness of stakeholders regarding the potentially positive impact of such a strategy on pollution and traffic congestion problems.
- **4. Problem related**: Complexity of the problem to be solved, which requires a detailed study on which the strategy must be based.

Implementation phase

- **8. Organizational**: The insufficient partnership arrangements made it difficult to apply a strategy to improve goods distribution throughout the city before and during the implementation of this measure.

Operation phase

- No barriers.

D.2.2 Drivers

Preparation phase

- **6. Positional**: The measure concerned is part of a global city strategy, based on a sustainable vision regarding urban transport
- **7. Planning**: Accurate planning and analysis to determine requirements for measure implementation thorough a previously made study of the stakeholders' profiles and requirements.

Implementation phase

- **6. Positional**: Exchange of experiences and lessons learned with other cities helped us design the strategy of urban goods distribution.

Operation phase

- **8. Organizational**: Constructive partnership arrangements during the implementation are essential to ensure the success of this type of measure (we developed a Freight Quality Partnership with stakeholders, which represents the basis of the strategy of urban goods distribution).
- **12. Other**: Making use of the results and conclusions of the previously made study ensures the quality of the strategy.

D.2.3 Activities

Preparation phase

- **4. Problem related**: The pressure of the problem had to be explained to stakeholders before starting the implementation of this measure.

Implementation phase

- **5. Involvement, communication**: Efforts had to be made in order to involve the stakeholders in discussions and then in partnerships.

Operation phase

- No activities.

D3 Participation

D.3.1. Measure Partners

- **Iasi Municipality (Leading role)**
  - in charge with conducting a study called "Efficient Goods Distribution in Iasi" to collect data regarding supply-distribution activities performed by business owners along CIVITAS corridor;
  - organize meetings with business owners and after that, signing partnerships with them;
  - preparing Urban Goods Distribution Improvement Strategy;
  - organizing information and educational campaigns to inform business owners about Urban Goods Distribution Improvement Strategy;
  - collaboration with Municipal Traffic Committee and Community Police to install special signs and markings for traffic restrictions;
  - approving Local Council Decision through which, goods distribution vehicles movement is prohibited within certain time intervals.
- **Business owners (Principle participant)**:
  - signing partnerships with Iasi Municipality;
  - adopting Urban Goods Distribution Improvement Strategy.
- **Municipal Traffic Committee and Community Police (Occasional participant)**: collaboration with Iasi Municipality for installing special signs and markings for traffic restriction;
  - proposing the movement restriction of goods distribution vehicles within certain time intervals.
- **Technical University Iasi (Occasional participant)**: organizing surveys to assess measure's impact.
- **The company that measured air quality (Occasional participants) – "SC Med Med SRL"** measured air quality level along the CIVITAS corridor;

D.3.2 Stakeholders

- **Traffic participants**: benefit indirectly by this measure because traffic on CIVITAS corridor is less crowded due to a reduce number of goods distribution vehicles on peak hours;
- **Citizens**: less polluted city due to a reduction of pollutant emissions leads to increase of human health;
- **Iasi**: improvement of city's image due to a better organization of supplying-distribution activities on a certain geographical area.

D4 Recommendations

D.4.1 Recommendations: measure replication

- **Strategy approach** – Such a measure can be transferred to other cities because establishing partnerships between business owners and municipality has advantages for both sides. Business owners, on the one hand, will benefit from advantages in conducting supply and distribution activities, and, on the other hand, the traffic in the area where this measure is implemented will be less busy and the pollution level will be reduced.
- **Measure implementation requirements** - A condition for the success of this type of measure is to elaborate an optimal strategy for goods distribution, including an accurate analysis to determine requirements for measure implementation through a previously made study of the stakeholders' profiles and requirements.

D.4.2 Recommendations: process (related to barrier-, driver- and action fields)

- **Involving key stakeholders** - Efforts in order to involve the stakeholders – through meetings, discussions and negotiations for achieving consensus between different partners – and to create partnerships are necessary for the implementation of the designed strategy.

Annex 1 Study of Strategic Goods Distribution Plan in Iasi

Introduction and objectives

The objectives of this measure are:

- to increase efficiency in goods distribution traffic
- to optimize the flow of HGVs in narrow business streets by improving loading and unloading behaviour and facilities
- to increase use of clean vehicles in goods distribution traffic
- to build a strong partnership with stakeholders.

The objectives focused on establishing the necessity of a new set of times or other technical solutions for traffic decongestion and for reduction of pollutant emissions for delivery and collections in Iasi.

The study was undertaken in order to asses the following issues regarding the efficient goods distribution in Iasi:

- The profile of the companies located on the CIVITAS corridor
- What influences or is influenced by the work of supply/distribution firms neighbouring institutions
- The main features of the business of supply/ distribution in Iasi
- Availability of firms to change their supply/distribution hours
- Correlations between supply/distribution activities and the impact variables (type of business, parking facilities, distribution hours, etc

This study is also related to research studies developed by other ARCHIMEDES cities. For example, in Donostia-San Sebastián, Spain, there was undertaken a feasibility study for goods distribution in central areas of the city. In order to improve the efficiency of goods distribution, a Freight Consolidation Centre was designed and there were investigated the volumes of goods and number of freight trips in central areas, and possible legal barriers to the implementation.

In Brighton & Hove, UK, it is anticipated that by the end of 2009 a Partnership between the city council and local freight operators will have been formed that should reduce the number of freight vehicle kilometres and increase loading rates of freight vehicles in the city centre, so that the total fuel consumption and vehicle movements can be reduced.

Our study is related to another study undertaken by Ústí nad Labem, Czech Republic, that regards the CIVITAS Plus corridor of the city which carries a high degree of freight transport. The main objective is to recommend actions to reduce noise in the most affected areas on the corridor.

Description of the Work Done

The main element of this deliverable is based around the results of a study into a present-day issue that is of interest for all cities in economic expansion: the topic of goods transportation in view of the issues surrounding energy supply and environmental impacts. The purpose of this study is to inform the development of the strategic goods distribution plan that will need to promote a participative culture among the local companies within a public partnership framework that is advantageous both for companies and the reduction of pollution from vehicles involved in goods distribution.

On one hand, the study aims to determine the development trend of the companies located on the CIVITAS corridor and to find out the goods supply and distribution schedule (*supply refers to the goods received by the buying company, while distribution refers to the goods sent by the selling company*) within Iasi County.

On the other hand, the study focuses on identifying the problems that companies face that are associated with supply/distribution activities and on identifying ways of improving the supply/distribution schedule in order to reduce pollution.

By our study, the actions are intended to change the hours of receiving/distributing goods by the business located on the CIVITAS corridor. They will have an important impact on the reducing of traffic congestion and therefore the reducing of pollution. The businesses located on the corridor, the neighbouring institutions, and local inhabitants will have a higher quality for their environment.

Survey Methodology

The target population for the study is local companies from Iasi County located on the CIVITAS corridor. Providing transport services is not the main purpose of business for these companies, but all of them are supplied with goods so that they can conduct their business or distribute goods to their customers.

The sample size is of 171 companies located on the Tudor Vladimirescu – Copou corridor. The sample is representative for the population of companies with supply/distribution activities from the Iasi County, on the Tudor Vladimirescu – Copou corridor. The population size is of 699 companies. Due to the small size of the target population, the sample size covers almost 25% of the total population. The proposed sample size was of 174 companies, while the effective sample size is of 171 companies (104 small companies, 49 medium-sized companies and 14 big companies).

The sample was drawn using a stratified random sampling method. The stratification variable is the corridor part. The corridor parts have been geographically delimited, including the main roads in Iasi located on the CIVITAS corridor.

The sample structure by parts of the corridor is presented in the following table. The differences between the proposed structure of the sample and the accomplished structure are explained by the differences between the target population and the real population found out in the field.

Table 1. The population and sample structure by layers (parts of the corridor)

Corridor part	Street	No of companies Population *total*	No of companies Sample *expected*	No of companies Sample *effective*	Teams
P1	Tudor Vladimirescu	42	11	11	1
P2	Bucsinescu, Elena Doamna	16	4	3	1
P3	Cuza Voda	97	24	24	2, 3
P4	Independentei	215	54	50	4, 5, 6,7
P5	Banu, G. Musicescu	22	6	7	7
P6	Carol I	84	21	21	8, 9
P7	Anastasie Panu	122	30	30	9, 10
P8	Stefan cel Mare	101	25	25	10
Total		699	174	171	-

Data were collected using the questionnaire. The questionnaire was delivered by face to face interviews with decision-makers within the companies. 10 interview teams were formed, each with 2-3 interviewers and a field coordinator allocated to each team.

To achieve the data collection, it required training of the interviewers (understanding the importance and scope of the survey, understanding the survey questions and their possible answers) because the topic is quite specialist. The data collection was accomplished in June 2009.

The survey questionnaire was developed in accordance with the needs of this element of the project and was structured as follows:

- Q1:Q9 - questions that describe the company profile: address, type of ownership, activity, number of employees, turnover growth, proximity to schools, hospitals etc.

- Q10:Q22 - questions about the deliveries received[1] and the distribution activities of the companies (timetable, vehicles capacity, frequency, parking facilities, access roads)
- Q23:Q27 - questions identifying the main problems of transport behaviour (supply/distribution) for the businesses located on the CIVITAS corridor and investigating the possibility of changing the timetable of goods distribution in order to reduce pollution and traffic congestion (incentives, problems arising, solutions etc);
- Q28:Q30 - contact data;

Main Survey Outcomes

The data was analysed as follows:

- Mapping the survey area (the corridor of interest was divided into 8 areas, each area having a corresponding number of companies) (Table 1);
- Database creation using the SPSS software and database verification;
- Data analysis with statistical software packages: SPSS and STATA.

The profile of the companies located on the CIVITAS corridor

The profile of the companies located on the CIVITAS corridor is important for establishing an appropriate schedule for goods distribution, according to the type of business, the size of the company, etc.

The majority of the surveyed companies have private ownership: their proportion is equal to 97.6%.

As regarding the main activity of the companies, the highest percentage in the sample corresponds to retail companies (78%). A relatively high percentage (11.2%) corresponds to public services sector (food & restaurant companies and hotels). The other companies are from construction (1.2%), business services (1.8%) and other businesses (7.7%).

Considering the number of employees, over 60% of the companies are small companies, having less than 10 employees. One-quarter of the companies have between 11 and 59 employees, and 2.4% of the companies have between 51 and 100 employees. However, 8.4% of the companies are very big companies as they each employ more than 100 persons.

For the majority of the companies that are small companies, more than three-quarters of them (81.7%) are retailers.

The majority of the companies surveyed (approximately 63%) have at most one extra working unit besides the company headquarters, which is in Iasi for 96% of these companies.

45 companies (28.5% of the total companies) have at most 4 working units. For retailers the number is even higher, around 10 working units.

For the second extra working unit, the location is in Iasi city for 76% of the companies, while 24% of the companies have the 2nd working unit in the neighbouring cities.
The 3rd working unit is located in Iasi city for 60% of the companies, while 40% of the companies have the 3rd working unit in other cities, such as Bucharest, Cluj, or closer cities as Suceava, Bacau and Piatra-Neamt.

The 4th working unit is located either in Iasi city for 46.2% of the units and elsewhere for the remainder.

The Analysis of the Potential Influence of Supply/Distribution Activities on Neighbouring Institutions

Approximately 73% of observed firms are located in close proximity to a bus/tram stop. Of these, less than one quarter (22%) have specially designated parking places for vehicles carrying out the supply/distribution activities. Retailers have even a smaller share of only 20% of the companies with parking facilities. With the

[1] This is referred to as 'supply' in the survey

trade activity being specific to 84% of the companies located near public transportation stations, a general lack of specially designated parking places for distribution vehicles can cause serious problems of blocking/congestion in these areas.

A considerable proportion of businesses (41% of the total) are also located close to a school. Of these only 22% have parking facilities for suppliers and distribution vehicles. ,Although retailers represent the clear majority (82% of the businesses located in the proximity of a school) only 14% have parking facilities, which is a situation that may result in traffic problems near educational establishments.

Among the firms located near hospitals (36%), only 23% have parking facilities for supply/distribution vehicles, while retailers, who are the most predominant type of business located near hospitals (80% of businesses located close to hospitals), have such facilities at a rate less than 20%.

More than half of companies surveyed (52%) were near to hotels and/or restaurants, and only 20% of these firms can avoid blocking/congestion by having special parking places designed for supply/distribution. Again, retail businesses, which comprise the clear majority of the businesses in such locations (81%), have very provision of parking for collection and delivery vehicles (13%).

The Main Features of the Supply/Distribution Activities

The results from questions
a) Goods receiving

- 76% of firms only receive goods (80% of them are retailers), 3% of firms have only distribution activities (all of them are retailers), and 19% of firms both receive goods and perform distribution activities (74% of them are retailers). Only 2% said they did not perform such activities at all.
- More than half of firms (93 firms, of which 80% retailers of which less than one- quarter having parking facilities) receive goods during 9:00-12:00 hours.
- For approximately 43% of the companies, the hours of receiving goods are between 12:00-18:00 (82% of them are retailers and less than one-quarter have parking facilities).
- 27% of the companies receive goods between 6:00-9:00 hours (76% of them are retailers, a quarter of them have parking facilities)
- After 18:00 hours, the flow decreases significantly: less than 20% of companies receive goods between 18:00-22:00 hours and only 2% of companies receive goods between 22:00-6:00 hours. Moreover, only 20% of retailers receive goods after 18:00 hours and only one company does this activity during the night. Receiving goods between 18.00-6.00 hours is characteristic for companies other than retailers, public services, construction, banking, finance and insurance business.
- For almost two thirds of firms that receive goods (62%), parking time of distribution vehicles is up to 0.5 hours. Unfortunately, only one-quarter of companies have specially designated parking spaces available. This quick type of receiving goods is specific to more than half of retailers and construction companies (57.6%), to over three-quarters of public service businesses (82%) and to approximately 85% of firms with other type of businesses.
- Parking time is higher than half an hour particularly for retailers: approximately 26% of them require between 0.5-1 hours for parked vehicles when receiving goods, 8% between 1-2 hours, and 3% more than 2 hours. Of these companies, less than one-quarter has parking facilities, and for the companies that parking time exceeds 2 hours, there are no such facilities.

b) Distribution

- Regarding the distribution activities, the most frequent hours are 9:00-12:00 hours, 75% of the companies perform this activity during these hours (77.8% are retailers, more than half of them providing parking facilities).
- 53% of the companies that distribute goods (of these 68.4% are retailers, and a half provide parking places) use the 12.00-18.00 hours, while 33.3% (of these half are retailers and only one-third of them have parking facilities) distribute goods between 6.00-9.00 hours.
- Only 11% of retailers distribute goods after 18:00 hours and only one retailer distribute goods during the night. The companies that distribute goods during the 18.00-6.00 hours are in other business than retail, public services, construction, banking, finance and insurance.

- The parking time of distribution vehicles for goods distribution is slightly higher than for goods receiving. More than 60% of distribution vehicles use over 0.5 hours for parking.
- Parking time is especially high for retailers. Moreover, less than half of them have parking facilities for distribution vehicles when distributing goods. Also, for almost 14% of retailers that distribute goods, the parking time of distribution vehicles exceeds 2 hours.

The Assessment of the Firms' Availability to Change their Supply/Distribution Hours

Only 26 (16.5%) of firms engaged in receipt of goods have expressed their willingness to do so between 18:00-6:00 hours and only 3 of them would agree to shift to the night hours. 16 of the firms willing to receive goods after 18:00 hours have parking facilities designed for this type of activity.

Regarding the option on making goods distribution during off-peak traffic hours, the number of companies willing to do so is much smaller proportion (only 8% of them), and they are only willing to do so between 18:00-22:00 hours. These three firms also receive goods and are part of the group that responded positively to the question about receiving goods between 18:00-22:00 hours.

The most preferred facility by the companies that have agreed with shifting supplying hours is exemption/reduction of fees and taxes and receiving free access to existing parking for supplying/distribution vehicles.

Other facilities would motivate businesses to shift supplying/distribution hours during off peak hours (18:00-6:00) are:

- design of parking facilities,
- exemption from paying penalties when parking in forbidden areas;
- rewarding the night-shifts.

However, most of the companies (over 60%) did not specify what facilities they would like, whilst leaving Iasi City Hall to decide on this.

120 of the firms included in the sample (70%) would not accept supply/distribution activities during 18:00-6:00 hours in exchange for incentives granted by the City Hall. However, almost 90% of them face problems related to the effectiveness of the supply/distribution. Providing solutions and facilities to help solving these problems may be an important starting point in negotiating with the firms less willing to accept changing the supply/distribution within reduced traffic hours.

Another possible measure to optimize urban traffic should aim to reduce the amount of goods transport that occurs with heavy vehicles. Such regulations regarding the freight transport should be undertaken by Iasi City Hall together with representatives of local businesses, Transport Companies and Romanian National Company of Motorways and National Roads. There are also possibilities to ensure some parking facilities within certain scheduled hours, as a result of a decision taken together with the beneficiaries.

Correlations Between Supply/Distribution Activities and the Impact Variables

A higher frequency of receiving goods becomes positively correlated with the fact that the company is a retailer.

- Implication: A possible measure to optimize urban traffic should be aimed particularly for this type of businesses.

The frequency of receiving goods is positively correlated with the time at which this activity occurs. Thus, the highest frequency for this activity is between 9:12 hours (a statistically significant Spearman correlation coefficient = 0.262) and between 6:00-9:00 hours (a statistically significant Spearman correlation coefficient = 0.213).

- Implication: a useful measure for urban traffic decongestion would be to give incentives (benefits) to local companies that are receiving goods before18:00 hours, in order to shift their timetable after 18

hours. It will result in an increase of the number of companies receiving goods after 18 hours by 38% from 26 to 36 (21% of all firms). Note that 81% of these companies (29 firms) do not have parking facilities for supply/distribution vehicles.

- Stipulation of benefits (incentives) is even more necessary in that there is a negative correlation between the frequency of purchasing and supply and the agreement to change these activities to after 18 hours.

In our study there are more correlations that should be considered in order to establish the implications and the necessary measures within a strategic goods distribution plan.

Such correlations occur between:

- the vehicle type and the frequency of receiving goods. There is correlation between frequency of receiving goods and the tonnage of the vehicles both for low-tonnage vehicles (up to 1.5 tonnes) or heavy vehicles (over 7.5 tonnes);
- the existence of parking facilities and restaurant/catering -type activities (positive correlation)
- the existence of parking facilities for goods vehicles and the company size (number of employees exceeding 10) (positive correlation);
- parking duration and the type of vehicle used for supply;

Main Conclusions of the Survey

In conclusion, a lack of parking facilities has been noted. Within the meetings with beneficiaries the Municipality has proposed parking facilities for improving traffic flow. The Municipality suggested achieving this by changing parking arrangements on one side of the corridor, in order to obtain the approval of the companies towards changing their goods distribution schedule. In other areas the Municipality is trying to construct access ramps and additional parking places

However, there is reluctance on the part of businesses to change their goods distribution schedule, possibly even if the Municipality decides to offer different facilities. This appears to be because businesses anticipate great difficulty in accommodating the change in their goods distribution schedule.

The main target group, towards which the actions of Iasi City Hall should be directed in order to optimize the supply /distribution activities and traffic flow, is represented by retail businesses, which are most numerous, representing about 78% of all firms surveyed and over 80% of firms located in the proximity of crowded places, such as transport stations, schools, hospitals, hotels, restaurants, while having the fewest parking places for vehicles that carry supply/distribution activities.

Also, special attention should be paid to companies with several working units (more than 6 working units for supplying companies, and more than 3 working units for distribution companies) that should perform the 2 types of activities during the optimal hours 18:00-6:00 hours.

The most used hours for both receiving goods and distribution, are in order as follows: 9.00-12.00, 12.00-18.00, 6.00-9.00. In the 18.00-22.00 range, less than 20% of firms have this type of activities.

In conclusion, we can state that:

- There is the need to modify supply/distribution hours in order to consider carrying out these activities during reduced traffic hours (18.00-6.00 hours);
- The firms showed availability to adopting the proposed hours (most of the firms would prefer the first period of reduced traffic, 18.00-22.00 hours);
- There are ways to stimulate companies in agreeing with the proposed hours (facilities);
- There is the possibility of negotiating with firms who initially refused, based on providing solutions to the difficulties they face;
- The main target group of companies (retailers) could be the first to address in order to optimize the supply/distribution activities.

The CIVITAS corridor is composed of the most circulated roads that cross the city centre and make the connections between the city and its suburbs. It is important also from the point of view of students living in Iasi, as the corridor is bounded by two important University campuses (Tudor-Vladimrescu for the "Gh. Asachi " Technical University of Iasi and Copou for the "Alexandru Ioan Cuza" University of Iasi).

Therefore, the impact of a better transportation along the corridor will on the local environment will be beneficial for all inhabitants of Iasi city.

Annex 2

Questionnaire – after situation

M.66 - Efficient goods distribution

Specify the socio-professional category	trafic drivers		freight operators		shopkeepers	

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Lastest school attended _____.
4. To what extent do you agree with the following statements (with a grade from 1 to 5, where 1 has the meaning "total agreement" and 5 "total disagreement")

The traffic in Iasi is very busy	1 2 3 4 5
Traffic congestion is a consequence of the economic development of Iasi in the last period	1 2 3 4 5
The high number of commercial vehicles contributes greatly to pollution in Iasi	1 2 3 4 5
Businesses, shops, commercial activities in the city should use vehicles with low levels of emissions	1 2 3 4 5
Iasi companies of any kind should be encouraged in their work because they contribute to the development of the city	1 2 3 4 5
A balance between the economic development of the city and the pollution within acceptable limits is possible	1 2 3 4 5
Pollution level in Iasi results particularly from other activities, not from distribution and transport of goods	1 2 3 4 5

5. The established partnership between the local authorities and the major distribution companies in order to reduce heavy vehicle traffic and emissions of harmful gases, especially in downtown is:
□ very good □ good □ not bad □ bad □ very bad

6. The Urban Goods Distribution Improvement Strategy made to encourage economic development in a sustainable city without increasing pollution level is in my opinion:
□ very good □ good □ not bad □ bad □ very bad

7. Many cars circulate in our city generating excessive pollution
□ yes □ no □ I don't know

8. Commercial vehicles running in Iasi for the transport of goods are not compliant with the pollution standards
□ yes □ no □ I don't know

9. The access in densely inhabited areas and in the city center should only be allowed for ecologically "clean" vehicles
□ yes □ no □ I don't know

10. Do you have any suggestions for improving the system of distribution of goods in Iasi, in compliance with the environmental standards?

Thank you!

Executive summary

One of the general objectives of the ARCHIMEDES project is to improve several aspects of the public transport in the city of Iasi. As part of this measure, the Municipality of Iasi and the public transport company implemented a GPS tracking system for 100 public means of transport (64 buses and 36 trams) out of a total fleet of 276 vehicles, an incident management system for a more efficient handling of accidents and complaints, and a maintenance facility centre, where the storage and recording equipment of the above-mentioned system are located, and from where vehicles are monitored and passengers' complaints are recorded.

In order to assess the impact of the measure the following was used:

- a survey in the area of impact with the following key results:
  - the quality of service indicator shows an increase in respondents' satisfaction with the results of the measure.
  - the awareness level indicator increased by 8% among the interviewees who had heard of the project and of this measure
  - the acceptance level indicator shows a slight increase by 4% among the respondents
- monitoring of performance data on public means of transport through GPS, which revealed an improvement by 4% of the accuracy of timekeeping indicator.

The economic impact of the measure was assessed by means of a cost-benefit analysis, which implied using the economic indicators and monetising the accuracy of timekeeping indicator. This analysis resulted in a positive net present value (NPV = 6,290,299 €).

The following can be regarded as lessons that were learned during the implementation of this measure:

- the implementation process must be very well organised and the parties involved must work together to solve the problems that may appear;

- the training sessions should be organised separately for those who are very much accustomed to using computers and for people who use them less often, so that they all come to the same knowledge level with respect to the software applications installed as part of this measure;

- the maintenance of the two systems (hardware and software) is very important for the their efficiency, therefore the persons who attend the training sessions should be carefully selected.

In terms of the impact of the measure, it has been noticed that tracking means of transport through GPS and solving complaints more rapidly lead to major improvements of public transport services and thus of the relation between the public transport operator and the users of the services it provides.

IAS 76 - Bus Management System in Iasi

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To reduce traffic congestion by encouraging the use of public transport instead of private cars.

(B) Strategic level:

- To improve the quality of public transport and thus to attract people to use public means of transport.

(C) Measure level:

- To plan public means of transport on each route according to the number of passengers at different times of the day.
- To implement a GPS tracking system for monitoring 100 public means of transport.
- To implement an incident management system.

A1.2 Target groups

- the public transport company – because the measure enables appropriate planning of vehicles on each route

- public transport users – because this measure enhances the quality of transport services

A2 Description

The main objective of measure 76 is to build a common platform for the integrated surveillance and control of 36 trams and 64 buses through GPS modules, with a view to optimising the transport schedule. These vehicles run on routes that cover the CIVITAS corridor either completely or partially (see Fig. 1). The improvement of public transport services through the implementation of this measure leads to:

- a change in users' perception of transport services, and consequently to an increase of the number of users;
- reduced waiting times at stops;
- a reduction in the number of incidents involving public transport vehicles.

The measure comprises three tasks: T8.11.1 - Global Positioning System (GPS) tracking system, T8.11.2 - Maintenance facility centre, and T8.11.3 - Modules for incident management and specific equipment.

- Task 8.11.1 GPS tracking system: each vehicle is equipped with a GPS satellite positioning module, a GSM module for communication with the main control centre, antennas, and accessories.

- Task 8.11.2 Maintenance facility centre: this centre is equipped with management, recording and storage systems. The employees of the public transport company who work in this centre supervise the GPS-tracked public means of transport, record and forward complaints received through the

toll-free telephone line, and download, when necessary, the video images recorded in vehicles by the video surveillance system implemented through Measure 13.

- Task 8.11.3 Modules for incident management and specific equipment: the incident management module is integrated with the toll-free telephone line (0800.110.427) and it manages all events that occur during the operation of the traffic management system.

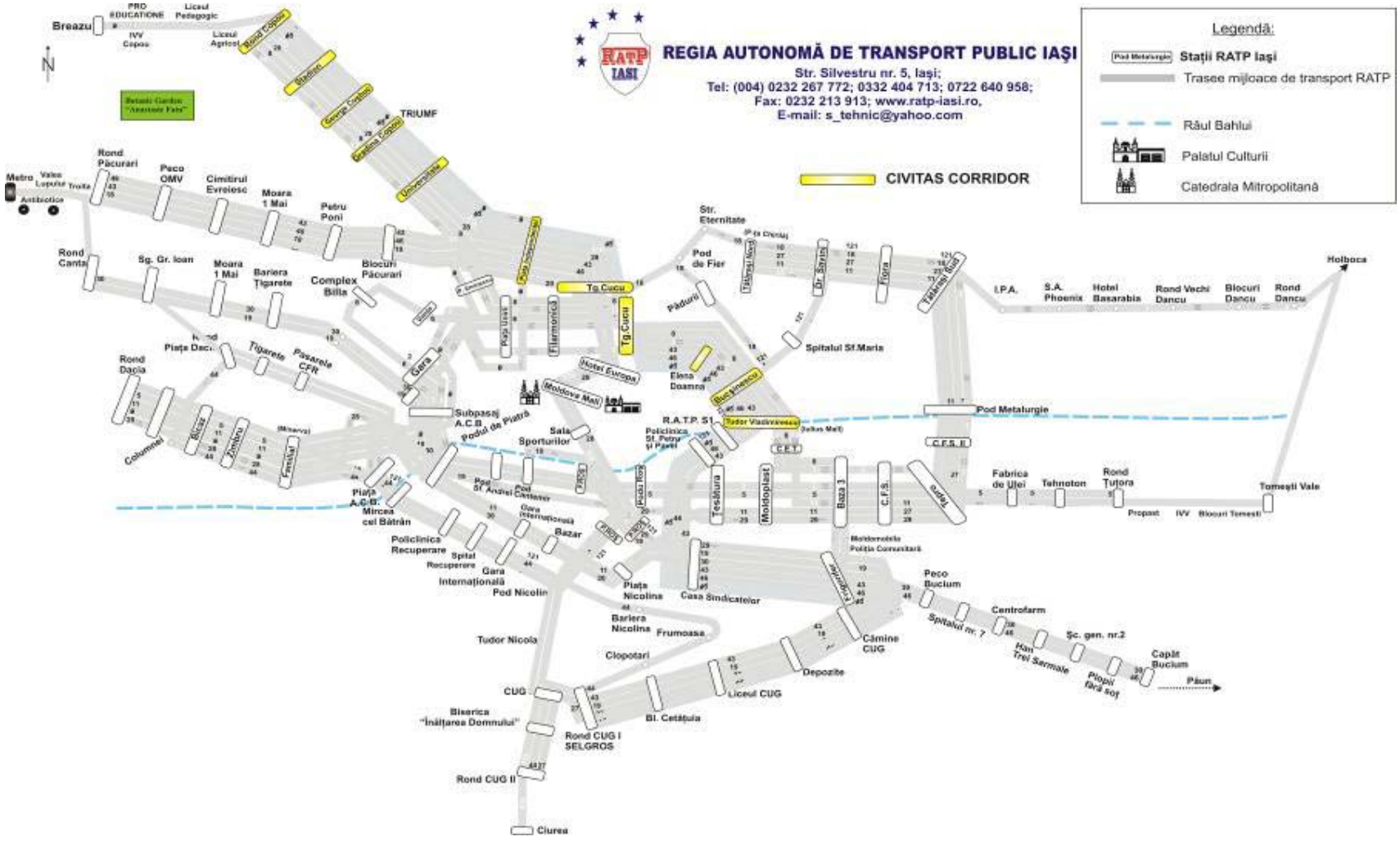


Fig. 1 Map of the public transport network of Iasi

GPS tracking system and maintenance facility centre

Each public transport vehicle was equipped with a GPS satellite positioning module, a GSM module for the communication with the main control centre, as well as with antennas and accessories.

The equipment mounted on the public means of transport consists of a GPS module (X700), an external GSM antenna, connection harness, and a GPS antenna. The system's functionality can be extended by interconnecting optional accessories: driver identification button reader, temperature sensor, OneWire splitter, immobilization relay (Fig. 2).

Fig. 2 – The components of the equipment installed on vehicles
Standard components: 1. X700 device; 2. external GSM antenna; 3. vehicle connection harness; 4. GPS antenna
Optional accessories: 5. driver identification button reader; 6. temperature sensor; 7. OneWire splitter
8. immobilization relay

The GSM communication equipment and the GPS management software were installed in the maintenance facility centre to display and manage the whole transport fleet (Fig. 3). The software application includes the following modules:
– relay module: for processing the messages from the GPS modules;
– database module: the storage location for the interpreted messages;
– map access module.

The vehicles and the maintenance facility centre communicate through SMS on mobile phone infrastructure using 3G and GPRS technologies. The refresh rate of the information is 30 seconds.

Fig. 3 The maintenance facility centre

The portal software application can locate any monitored vehicle with a precision of less than 10 metres. The vehicles are displayed both on a vector map and in tabular form, where the address of the location or the Hot Spot is assigned to each of them (Fig. 4).

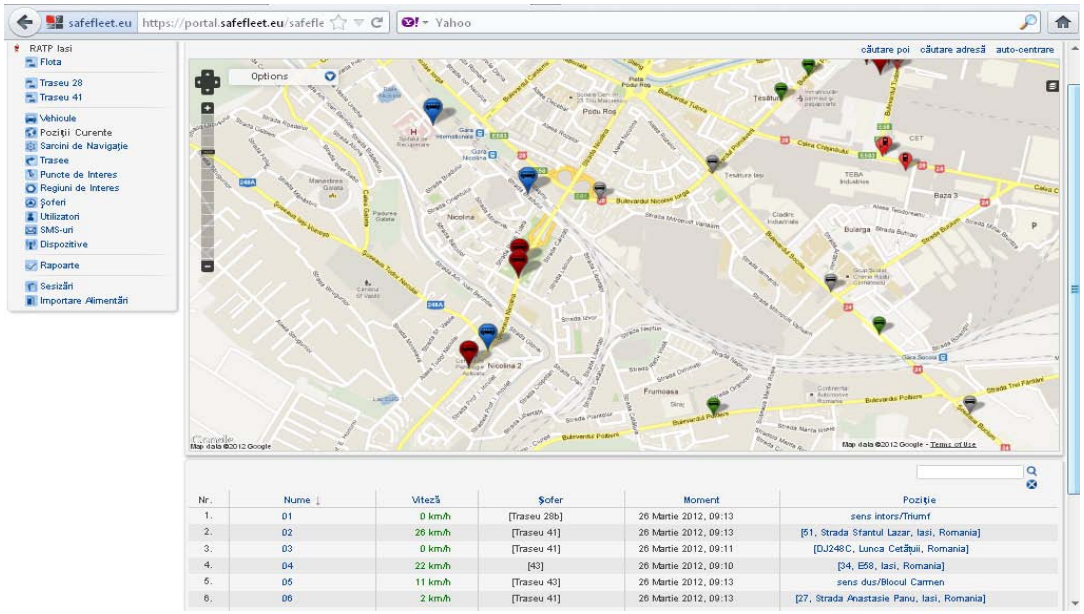


Fig. 4 Position of the vehicles displayed both on the vector map and in tabular form

Technical details of the surveillance system are presented in Annex 1.

Management of Incidents

The incident management software integrates Measure 38 (Toll-free telephone number - 0 800 110 427) and it manages all events that occur during the operation of the traffic management system. In order to record a new incident, the operator has to log in and fill in the following data: the name of the claimant, the ways he/she received the complaint (via telephone, email or on paper), the type of the incident (e.g. complaint, request), details on the incident (e.g. broken ticket in a validation machine, request for route-related information), and notes (Fig. 5).

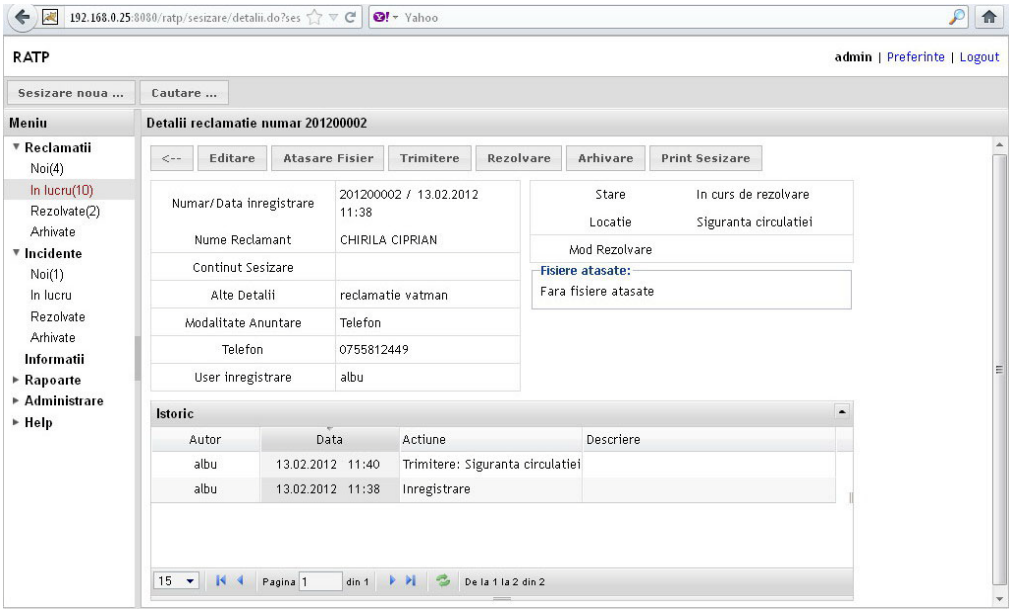


Fig. 5 A new incident

If the incident is a complaint, the operator sends it to the IT Department. If it is a more serious incident (for example an accident), then it is sent to the Department of Traffic Safety to be solved (Fig. 6).

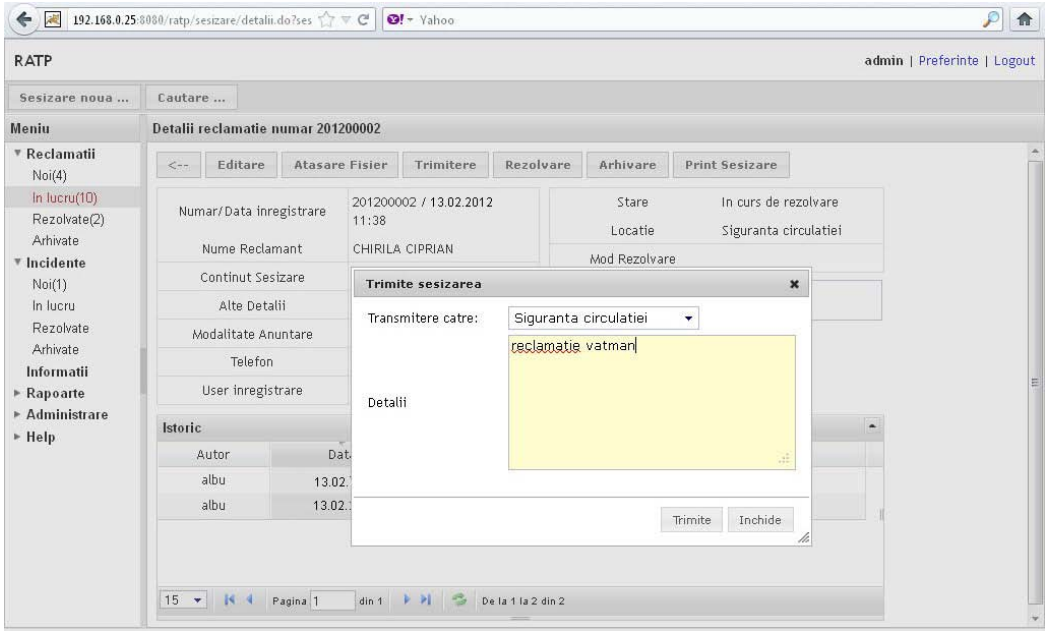


Fig. 6 Sending a new recorded incident

As soon as the e-mail describing the incident arrives at the corresponding department, all necessary measures are taken to solve the problem (Fig. 7).

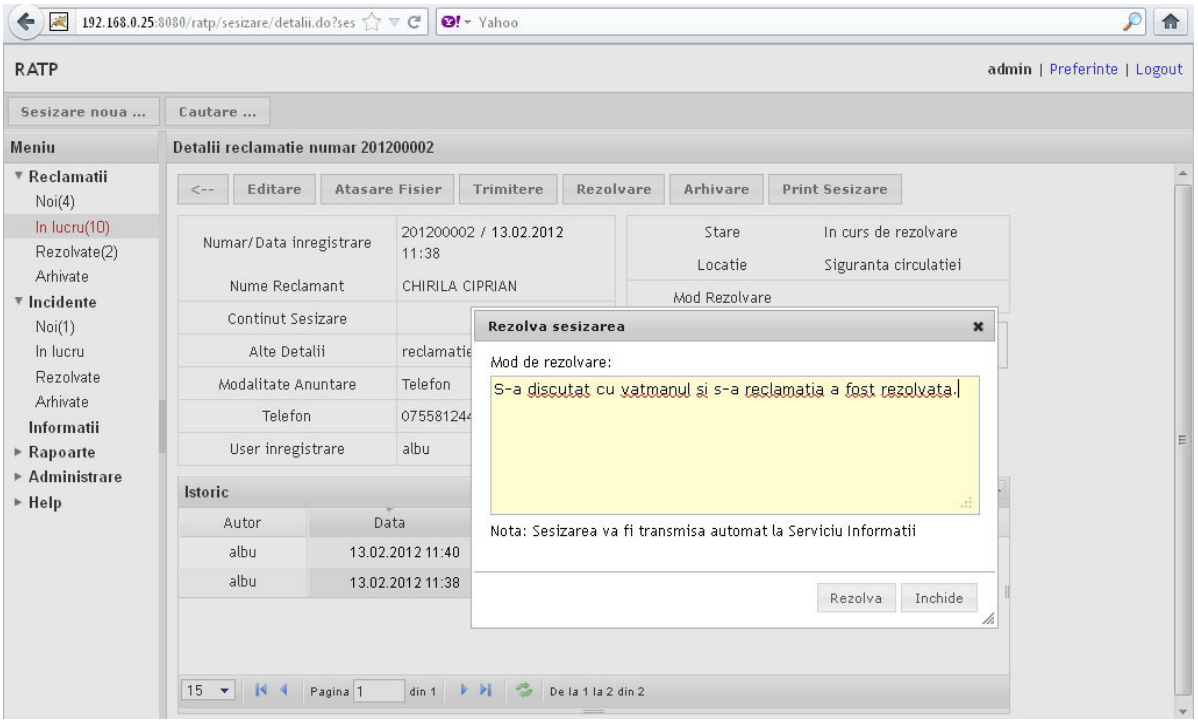


Fig. 7 Solving an incident

This measure has a significant impact on the transport system. The GPS surveillance system helps to better control and plan public transport services, which leads to improved service quality and increased attractiveness of public transport. Quality improvement has a social and economic impact because public means of transport can be planned appropriately for each route. The incident management system also improves the quality of public transport services by solving the problems passengers report.

During the implementation of the tasks, the inhabitants of Iasi were informed via written media, radio and TV on the importance of these systems.

The reactions of the written press (Annex 2), radio and TV were positive, and encouraged the idea of extending this activity to the level of the whole city.

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – before the implementation of this measure, only at end stops was it possible to check and correct the way the timetable for each route was observed; now each means of transport included in the system is traced in real time.
- **Use of new technology/ITS** – the system allows a new approach to the concept of traffic control by monitoring the traffic through GPS.

B2 Research and Technology Development

B3 Situation before CIVITAS

Prior to the implementation of this measure there had been no systems to track public transport vehicles in Iasi. Therefore it was difficult to continuously monitor the quality of public transport and to offer passengers high-quality services. Furthermore, it was not easy to inform public transport users about delays, incidents, changes of routes, etc.

There was also no computerised system for the management of incidents: the person who talked to the claimants wrote the complaints by hand, somebody else rewrote them on a computer, printed them and distributed them to the appropriate departments, which carried out investigations, and after the complaints were solved, the same person collected information on the answer that he or she then gave to the claimant.

B4 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Tender procedure (*July-October 2011*) – For a better organisation of the vehicle fleet, Iasi City Hall together with the public transport company of Iasi decided to implement a surveillance system to control 100 public transport vehicles through GPS modules, with a view to optimising the transport schedule. Therefore the tender documentation for a GPS management system was prepared and the tender procedure was organised.

Stage 2: Contract (*October 2011***)** - a contract was signed with the winner of the tender.

Stage 3: Implementation (October 2011 - March 2012) – the winner company implemented the so-called "SafeFleet" system.

Stage 4: Evaluation (before data collection - May 2011, after data collection - June 2012 and September 2012) – surveys were organised for the assessment of the measure.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure no**. **DSS 74, MNZ 78** – similar systems have been implemented by other cities involved in the ARCHIMEDES project (Monza and Donostia-San Sebastian).
- **Measure no. IAS 13 – Video Surveillance System** – the Bus Management System helps the transport company manage the video files recorded by adding space coordinates.

- **Measure no. IAS 35 – Education and promotion programme –** the GPS tracking system was presented within the Education and promotion programme as an improvement of the public transport quality

- **Measure no. IAS 38 – Travel Information Telephone Service –** the Incident Management Module was integrated within the Control Centre, which manages a toll-free telephone service.

C Impact Evaluation Findings

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

The first major impact of this measure is on the transport system: the vehicles can now be monitored within a centralised system, which allows better planning and coordination of vehicles, leading to improved quality of service (more accurate and reliable), which increases the attractiveness of public transport.

The improvement of transport quality has an economic impact because planning of vehicles on each route is now more accurate, i.e. the transport schedule has been better adjusted to passenger demand.

The surveillance system allowed the interconnection with real-time information panels that were installed in public transport stops as part of a non-CIVITAS pilot project, which resulted in an indirect social impact of the CIVITAS measure.

C1.1.1 Selection of indicators

No.	Evaluation Category	Evaluation Sub-Category	Impact	Indicator	Description	Data /Units
2	Economy	Benefits	Operating costs	Operating costs	Costs	euro
2b			Capital Costs	Capital costs	costs per equipment and implementation	euro
2c			Maintenance costs	Maintenance costs	costs per equipment	euro
13	Society	Acceptance	Awareness	Awareness level	survey	Index (%),
14			Acceptance	Acceptance level	survey	Index (%)
18	Transport	Quality of Service	Service reliability	Accuracy of timekeeping	percentage of vehicles arriving / departing on time	Index (%)
19			Quality of service	Quality of service	survey	Index (%)

C1.1.2 Methods for evaluation of indicators

No.	Indicator	Target Value	Source of Data and Methods	Frequency of Data Collection
2	Operating costs	Decrease of operating costs	are made up of: - the wages of the personnel who supervised the traffic (6 persons) and the wages of the person who transmitted to the corresponding departments the complaints received from passengers, and who informed claimants on the result of their complaints - the data transfer costs	Annually
2b	Capital costs	144,095 €	result from the financial offer of the supply company	October 2011
2c	Maintenance costs	As low as possible	result from the financial data analysis regarding maintenance operations	Annually
13	Awareness level	Increased	A survey was conducted to assess these indicators. The interviews* were carried out by students in a public transport stop during five working days, before and after the measure implementation. 100 persons were interviewed in each stage (see section C.1.2 for details). Some details on the survey campaign are given below. **May 2011.** In order to assess the awareness level, the respondents were asked if they had heard about the CIVITAS project and if they knew that the following systems were implemented through this measure: a GPS tracking system for tracking 100 public transport vehicles; a maintenance facility centre to monitor tracked vehicles, and an incident management system to manage all events that occur during the operation of the traffic management system. To evaluate the acceptance indicator, the respondents were asked to answer on a 5-point scale if the public transport company had an efficient fleet tracking system; if the traffic controllers were enough to coordinate efficiently the public means of transport; if the public transport company had an efficient system for solving passengers' complaints. To determine the quality of service indicator, the respondents were asked if they were satisfied with the following aspects of the public transport service: frequency of vehicles; compliance with the timetables posted at stops; the way the requests and complaints of passengers were solved. **June 2012 and September 2012.** Another set of 100 questionnaires was used for face-to-face interviews in June 2012. The survey was conducted in the same place as in 2011. The questions for the awareness level remained the same, but they were adapted to the stage the task	Before – May 2011 After – June and September 2012
14	Acceptance level	Increased		

No.	Indicator	Target Value	Source of Data and Methods	Frequency of Data Collection
19	Quality of service	increased	was in (already implemented). The following questions were asked for the assessment of the acceptance level: if the public transport company had an efficient fleet tracking system; whether public means of transport comply with the timetables posted at stops; if the GPS fleet tracking system had improved the quality of public transport services; if the incident management system had improved the quality of public transport services. The questions for assessing the quality of service indicator remained the same.	
18	Accuracy of timekeeping	To keep the arrivals at stops in over 90% of the instances within the timetable	By means of the bus management system we are able to compare actual arrivals at stops with the timetables. The arrivals within a tolerance of 1 minute are considered on-time.	Before – October 2011 After – June and September 2012

* The questionnaire is to be found in Annex 3.

C1.1.3 Planning of before and after data collection

Evaluation Task	Indicators Involved	Completed by (Date)	Responsible Organisation and Person
Baseline data collection	Operating costs	Not applicable	PTI – Dana Cernat
	Capital costs	Not applicable	PTI – Dana Cernat
	Maintenance costs	Not applicable	PTI – Dana Cernat
	Awareness level	M33	TUI
	Acceptance level	M33	TUI
	Accuracy of timekeeping	M38	PTI
	Quality of service	M33	TUI
Collection of after data	Operating costs	M44, M49	PTI – Dana Cernat
	Capital costs	M44, M49	PTI – Dana Cernat
	Maintenance costs	M44, M49	PTI – Dana Cernat
	Awareness level	M44, M49	TUI
	Acceptance level	M44, M49	TUI
	Accuracy of timekeeping	M44, M49	PTI
	Quality of service	M44, M49	TUI
D12.2 Baseline and first results from data collection	All indicators	M44	Cristian Stoica
D12.3 Draft results template available	All indicators	M45	
D12.4 Final version of results template available	All indicators	M49	

C1.2 Establishing a baseline

We consider the year 2011 as a baseline year for comparing the evolution of the indicators.

The baseline conditions:

- operating costs: are made up of the wages of the personnel who supervised the traffic (6 persons) and the wages of the person who transmitted to the corresponding departments the complaints received from passengers, and who informed claimants on the result of their complaints.

- there are no maintenance costs and capital costs for the "before" situation because there were no similar systems before.

- for the accuracy of the timekeeping indicator we use the vehicle operation related data provided by the public transport company

Since IAS 76 was implemented after IAS 14 – Bus priority measures – we used the results from the latter in setting the value of the accuracy of timekeeping indicator in the "before" situation of IAS 76.

In IAS 14, bus line 41, which runs on the CIVITAS corridor, was taken as reference for the assessment of the accuracy of timekeeping indicator because it is the most representative in terms of coverage of the corridor. Its length is 20.1 km, and it takes 70 minutes for a bus to make a round trip. The appropriate department of the public transport company provided the data. The number of arrivals on time and the number of planned arrivals on time of the buses on line 41 during seven days in 2009, 2010 and 2011 were compared, with the result that 88% of the actual arrivals were on time.

The accuracy of timekeeping indicator was calculated as the weekly weighted mean of arrivals on time.

Although the percent of 88% was determined on a single bus route along the CIVITAS corridor, we consider that we can extend it to all GPS-tracked public means of transport, because they operate either right on this route, or on routes that include sectors of the corridor.

- in order to assess the awareness level, the acceptance level, and the quality of service we conducted surveys in a public transport stop.

The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The representatives of the three institutions decided that the survey was to be conducted on the same sample size (100 people) after the measure has been implemented, thus making it possible to compare the results of the "before" and of the two "after" situations. The respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the three periods differed one from another each year.

The interviews were carried out in the same public transport stop during the three periods the surveys took place in (once before and twice after the implementation of the measure). We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

C1.3 Methods for Business as Usual scenario

In the case of the BaU scenario no investments in a bus management system were made. There were no systems for public transport vehicle tracking in Iasi. Therefore it was difficult to continuously monitor public means of transport and even more difficult to optimise their circulation. Informing users about delays was impossible.

There was no computerised system for management of incidents, either: the person who talked to the claimants wrote the reclamations by hand, somebody else rewrote them on a computer, printed them and distributed them to the appropriate departments where investigations were made, and after the complaints were solved, the same person collected information on the answer that he or she then gave to the claimant.

We consider that the accuracy of timekeeping indicator remains constant throughout the progress of the whole project at 88%, which has been set in the baseline as reference. The reason for our assumption is that the conditions on which this percentage has been obtained (i.e. the lane reserved for public means of transport, and the traffic lights priority system which have been implemented along the CIVITAS corridor) are not going to change throughout the progress of the project. The only thing that may influence the accuracy of timekeeping indicator is the increase of the number of personal cars on the CIVITAS corridor. However, it is very difficult to estimate to what extent this percentage would decrease along with the change in the number of private cars in the next years.

The annual values of the economic indicators are updated with the annual inflation rate for energy, fuel, urban transport, railway transport, etc. This rate is published by INS (the National Institute of Statistics) for 2011. The forecasting for 2012-2014 was made by BNR (the National Bank of Romania). Our estimation for the period 20015-2016 has not been mentioned within the public sources of BNR yet.

	INS	**BNR**			**Our estimations**	
Annual inflation rate	2011	2012	2013	2014	2015	2016
	5.79%	5.32%	6.89%	6.60%	6.60%	6.60%

The risks of the BaU scenario consist in the evolution during this project of the inflation rate in the circumstances that the number of complaints and the accuracy of timekeeping rate remain constant.

C2 Measure results

C2.1 Economy

2. Operating costs

Table C2.1.1 Operating costs

Indicator	Before (2011)	B-a-U (2012)	After (2012)
2. Operating costs (euro)	62,772	66,406	19,104

Indicator	Difference: After – Before	Difference: After – BaU (2012)
2. Operating costs	- 43,668	- 47,302

The before-situation

The public means of transport were supervised on the one hand from within the main dispatch centre, where 6 employees worked in turns every month, and on the other hand directly on the streets by 6 traffic agents. The monthly operating costs correspond to their salary. The daily/monthly activities in the dispatch centre were distributed as follows: 60% of the time was used for traffic management (which are the operating costs of this measure). 10% for the toll-free telephone line, and 30% for other specific activities.

The operating costs for the management of incidents consisted in the wages of one employee who registered the complaints, directed them towards the appropriate departments, received the answers from them and generated the feed-back to the claimant.

The operating costs per month for the whole measure are 5,231 € (Table 1).

Operating costs (euro)	Monthly	Annually
Main dispatch centre (6 persons; 60%)	2,145	25,740
Traffic agents (6 persons)	2,628	31,536
Management of incidents (1 person)	458	5,496
Total	5,231	62,772

Table 1 – Operating costs in the "before" situation

The after-situation

a. Data transfer costs
The data transfer from each means of transport monitored through GPS (64 buses and 36 trams) to the main dispatch centre is made through 3G technology (SIM cards).

The total cost of the subscriptions for data transmission for all 100 vehicles is 400 €/month

b. Monitoring team costs
A four-person team works within the main dispatch centre of the public transport company (the team has reduced by 2 persons). This team has several tasks, which are distributed from the viewpoint of the time assigned for each as follows: 50% of the total working time is used for vehicle tracking through GPS, 10% for monitoring images from the video cameras installed in the 100 vehicles as part of Measure 13, 10% for answering the toll-free telephone, and 30% for other specific activities.

The operating cost for the management of incidents is considered to be "0" in the after-situation because the person who used to do the specific activities was replaced by the software.

By adding all monthly costs we get 1,592 € operating costs for the whole measure (Table 2).

Operating costs (euro)	Monthly	Annually
Data transfer	400	4,800
Main dispatch centre (4 persons; 50%)	1,192	14,304
Management of incidents	0	0
Total	1,592	19,104

Table 2 – Operating costs in the "after" situation

2.b Capital costs

Table C2.1.2 Capital costs

Indicator	Before (2011)	B-a-U (2012)	After (2012)
2.b Capital costs	N.A	N.A.	194,626 €*

** the price in euro is obtained at an exchange rate of 1 € = 4.5 lei*

The capital costs are made of (Table 3):
- the costs of the equipment that build the GPS tracking system;
- the cost of the software application that allows for the management of incidents;
- the cost for training the staff to use the incident management system.

Capital costs	euro
GPS tracking system	95,782
Management of incidents software	78,844
Personnel training	20,000
Total	194,626

Table 3 - Total capital costs of the measure

In the case of the BaU scenario no investments for purchasing the GPS and the incident management system are made. This situation is the same for the before-data.

2.c Maintenance costs

Table C2.1.3 Maintenance costs

Indicator	Before (2011)	B-a-U (2012)	After (2012)
2.c Maintenance costs (euro)	N.A	N.A	4,404 €

For the year 2012 the maintenance costs for the GPS tracking system represent the salaries of the maintenance team, i.e. 367 € on average per month or 4,404 € per year.

C2.2 Transport

Table C2.2.1 – Accuracy of timekeeping

Indicator	**Before (2011)**	**BaU (2012)**	**After (2012)**
Accuracy of timekeeping	88 %	88 %	92 %

Indicator	Difference: After – Before	Difference: After – BaU (2012)
Accuracy of timekeeping	4 %	4 %

The value of the accuracy of timekeeping indicator corresponding to the "before" situation and to the BaU scenario is the same because we assume the circumstances in which no investments are made in a vehicle surveillance system.

Since IAS 76 was implemented after IAS 14, we used the results from the latter in setting the value of the accuracy of timekeeping indicator in the "before" situation of IAS 76.

Although the percent of 88% was determined on a single bus route along the CIVITAS corridor, we consider that we can apply it to all GPS-tracked public means of transport, because they operate either right on this route, or on routes that include sectors of the corridor. The six bus routes on the CIVITAS corridor, on which only GPS-tracked vehicles operate, were taken as reference. The percentage of on time arrivals (88%) corresponding to the "before" situation was applied within this context to the number of planned trips of the buses running on the 6 routes. (Table 4).

Before (roundtrips / day)		Scheduled (100%)	On-time arrivals (88 %)
Bus	working day	734	646
	weekend	474	417
Tram	working day	157	138
	weekend	154	136

Table 4 – "Before" values of the accuracy of timekeeping indicator

The actual arrivals at stops were compared with the timetables by means of the software application of the traffic management system (Table 5). The arrivals within a tolerance of 1 minute were considered on time.

After (roundtrips / day)		Scheduled	On-time arrivals*	Accuracy of timekeeping
Bus	working day	734	675	92 %
	weekend	474	436	
Tram	working day	157	144	
	weekend	154	142	

* The values of the on-time arrivals are the average of the number of daily on-time arrivals recorded in June and September 2012 for the public means of transport running on the CIVITAS corridor

Table 5 – "After" values of the accuracy of timekeeping indicator

We did not include July and August in our analysis because this is a period of holidays, when fewer public means of transport are scheduled to run, and the traffic in the whole city is more reduced in the morning comparing to the rest of the year, which results in almost 100% of on-time arrivals of public

means of transport. Therefore we considered that the interval July-August is irrelevant for our analysis.

After the implementation of the system 92% of the arrivals were on time.

Table C2.2.1 - Quality of service

The interviews (before and after) for determining this indicator were carried out by students always in the same place. In Fig. 8 below we are giving some details about the respondents.

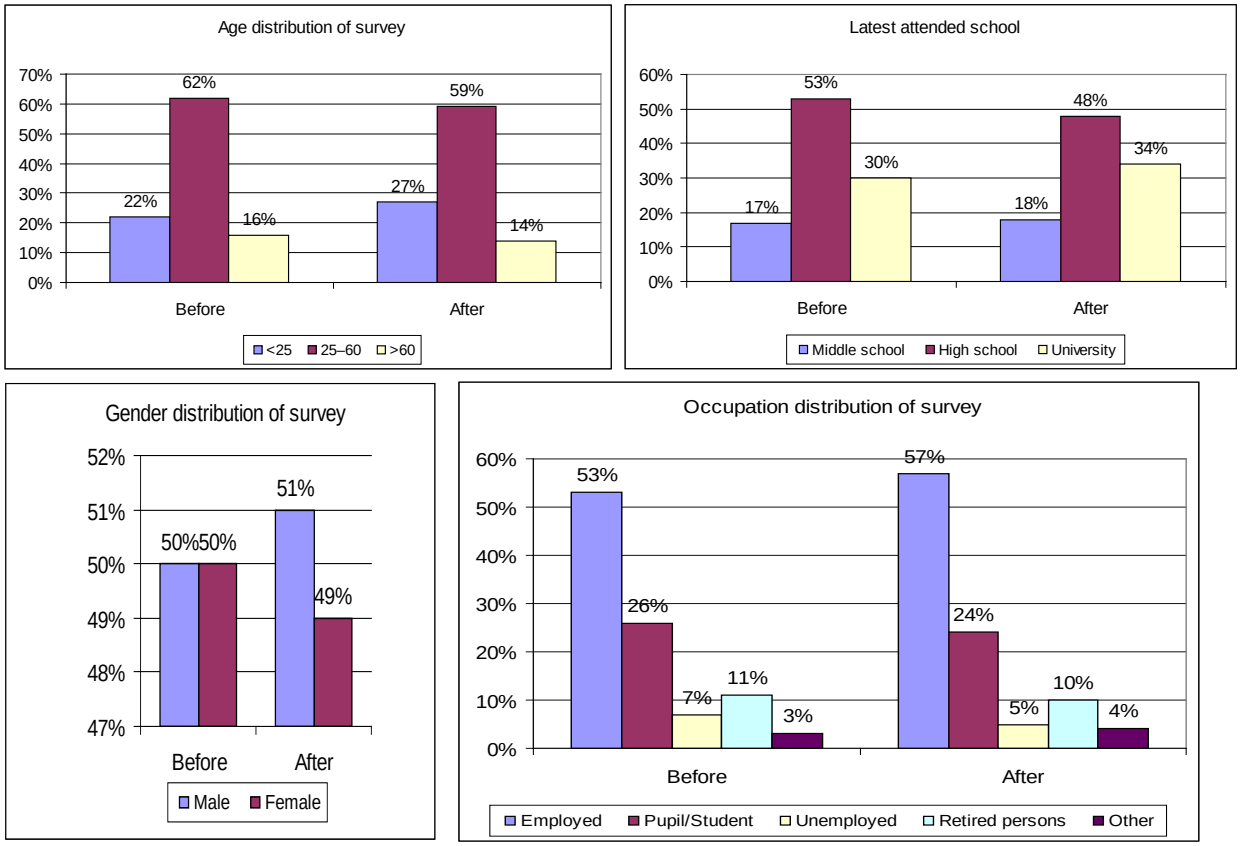


Fig. 8 Details about the respondents

On analysing the characteristics of the respondents (Fig. 8), we notice the following evolutions in the "before" and "after" situations:

- Most of the interviewees are within the 25 to 60 year-old bracket (62% and 59%, respectively).
- Most of them have attended only high school (53% and 48%, respectively).
- Both genders are (almost) equally represented.
- Most of the respondents are employed (53% and 57%, respectively), to which a significant percentage of students adds (26% and 24%, respectively).

Indicator		**Before (May 2011)**	**After (July 2012)**	**After (September 2012)**
15. Quality of service (%)	1. Totally satisfied	9%	11%	11%
	2.	17%	21%	24%
	3.	34%	32%	31%
	4.	15%	13%	12%
	5. Totally dissatisfied	25%	23%	22%

Indicator		Difference: After (July 2012) – Before	Difference: After (September 2012) – Before
Quality of service (%)	1. total satisfied	2%	2%
	2.	4%	7%
	3.	-2%	-3%
	4.	-2%	-3%
	5. total dissatisfied	-2%	-3%

For the assessment of this indicator, the interviewees were asked to answer how satisfied they were with the following:
1. the traffic flow of public means of transport .
2. the frequency of arrivals at stops of public means of transport.
3. the extent to which the timetables are observed
4. how passengers' complaints and requests are answered.

Both the table above (C2.2.1), and the graphical representation of the quality of service indicator (Fig. 9) contain the average of the percentage value resulted from the answers to the four questions for each of the five satisfaction levels.

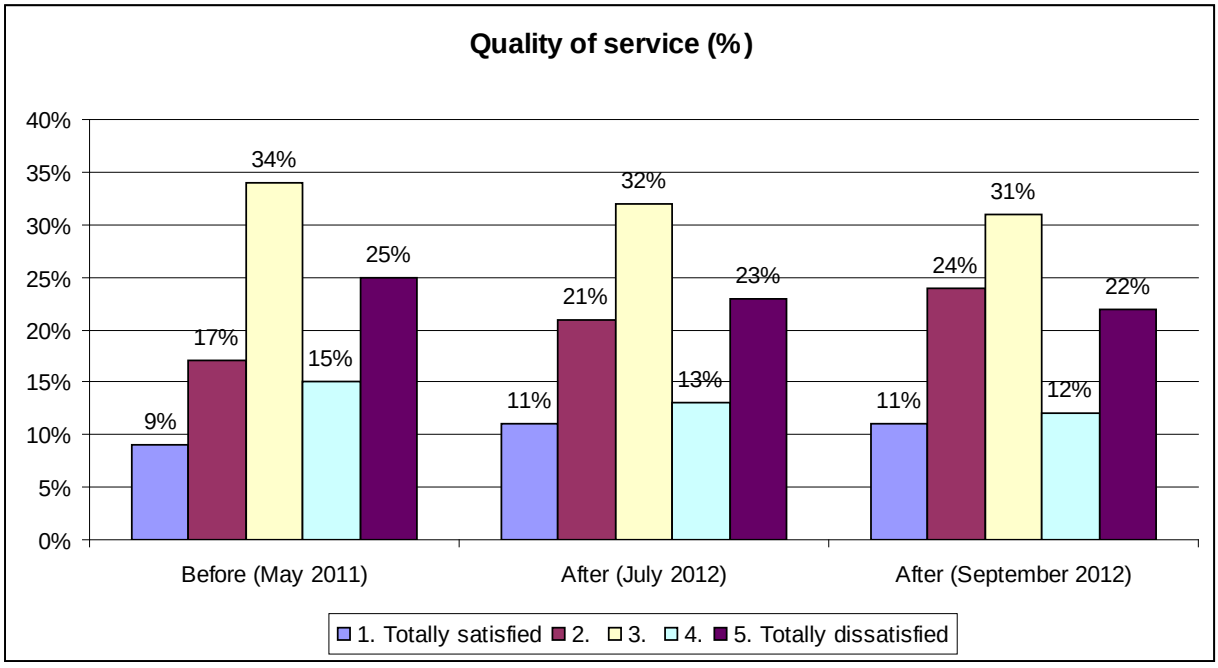


Fig. 9 Quality of service evolutions (before – 2011, after – July, September 2012)

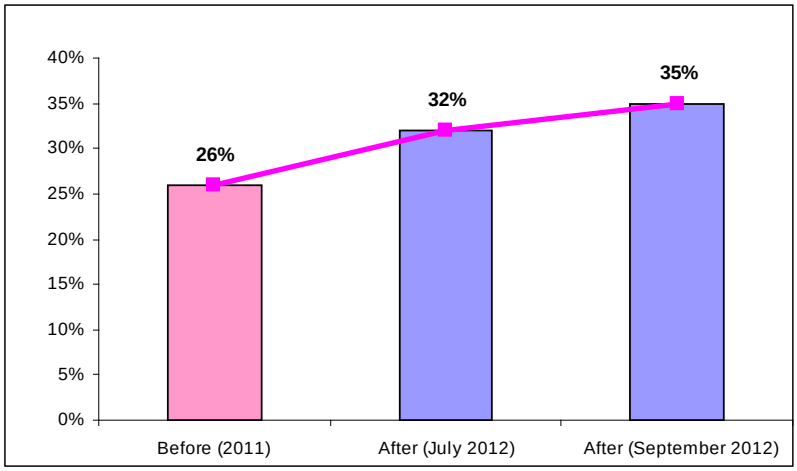


Fig. 10 Quality of service – positive feedbacks

The surveys carried out among passengers revealed an improvement of the quality of service. If we add the positive feedbacks (Fig. 10 – points 1 and 2 on the evaluation scale) recorded for this indicator, we obtain an increase of 35% in September 2012, after implementation, compared to the level of satisfaction of 26% recorded in 2011 (Fig. 10). The number of passengers included within the "neither satisfied nor dissatisfied" category remained almost the same (around 32%).

C2.3 Society

The details on the categories of respondents who were interviewed for the assessment of the awareness level and acceptance level indicators are presented in Figure 8 above.

Table C2.3.1 – Awareness level

Indicator		**Before (May 2011)**	**After (July 2012)**	**After (September 2012)**
13. Awareness level (%)	1. Yes	30%	35%	38%
	2. No	16%	13%	13%
	3. I don't know	54%	52%	49%

Indicator		**Difference: After (July, 2012) – Before**	**Difference: After (September, 2012) – Before**
Awareness level (%)	1. Yes	5%	8%
	2. No	-3%	-3%
	3. I don't know	-2%	-5%

For the evaluation of the awareness level indicator, the following questions were asked for both situations – before and after – however they were adapted to the stage the task was in (already implemented):

1. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?

2. Has the public transport company, as a part of the CIVITAS project, implemented a GPS tracking system on 100 public means of transport?

3. Has the public transport company, as a part of the CIVITAS project, installed an incident management system for handling – among others – special occurrences in traffic, requests, suggestions and complaints from passengers received by phone, fax, and e-mail?

Both the table above (C2.3.1) and the graphical representation of the awareness level indicator (Fig. 11) contain the average of the percentage value resulted from the answers to the three questions for each of the three possible answers.

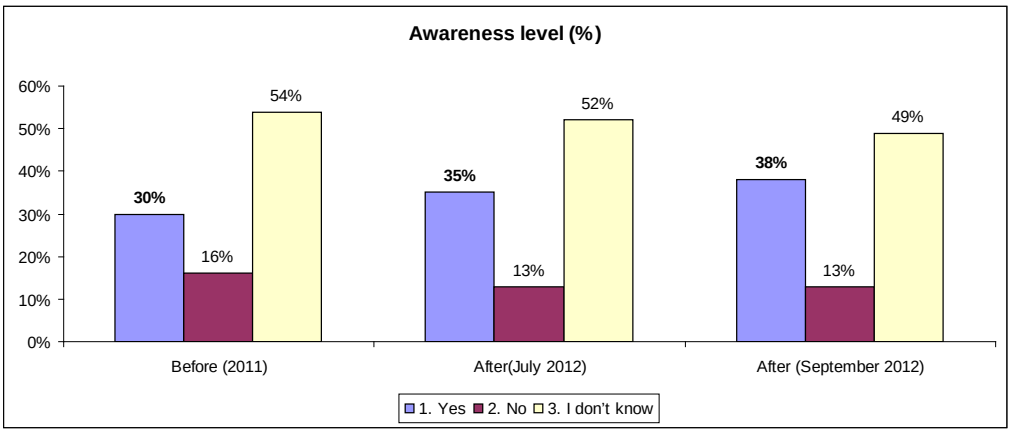


Fig. 11 Awareness level evolutions

Fig. 11 shows that the percentage of the respondents who had heard about the tasks implemented through this measure increased from 30% in 2011 to 35% in July 2012, and to 38% in September 2012. The number of those who had not heard about the measure decreased from 54% in 2009 to 52% in July 2012 and to 49% in September 2012.

Table C2.3.2 – Acceptance level

Indicator		**Before (May 2011)**	**After (July 2012)**	**After (September 2012)**
15. Acceptance level (%)	1. total agreement	1%	3%	4%
	2.	5%	6%	6%
	3.	34%	36%	35%
	4.	28%	25%	26%
	5.total disagreement	32%	30%	29%

Indicator		**Difference: After (July 2012) – Before**	**Difference: After (September 2012) – Before**
Acceptance level (%)	1. total agreement	2%	3%
	2.	1%	1%
	3.	2%	1%
	4.	-3%	-2%
	5.total disagreement	-2%	-3%

For the assessment of the acceptance level indicator, the respondents were asked to answer if they agreed to the following:
- for the "before" situation:
1. the public transport company has an efficient fleet tracking system;

2. traffic controllers are enough for surveying and managing public means of transport so as to obtain a proper frequency of vehicles;
3. the public transport company has an efficient system for solving passengers' complaints.

- for the "after" situation:
1. the public transport company has an efficient fleet tracking system
2. the public means of transport observe the timetables posted at stops
3. GPS tracking of buses and trams contributes to the improvement of the public transport service
4. the implementation of the incident management system contributes to the improvement of the public transport.

Both the table above (C2.3.2) and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the questions above for each of the five levels of agreement.

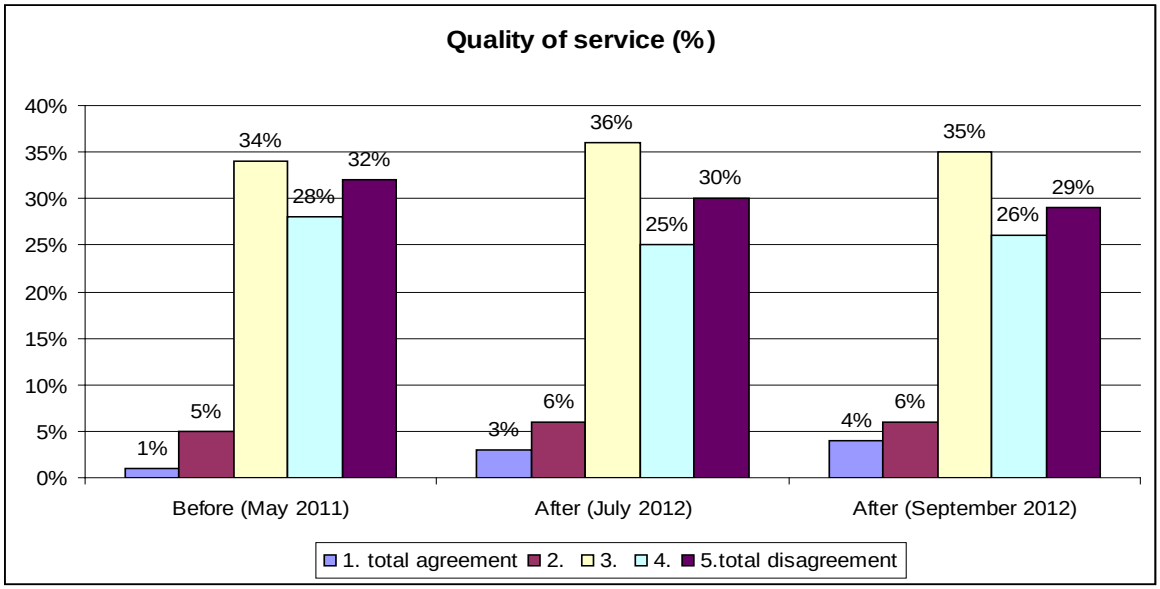


Fig. 12 Acceptance level evolutions

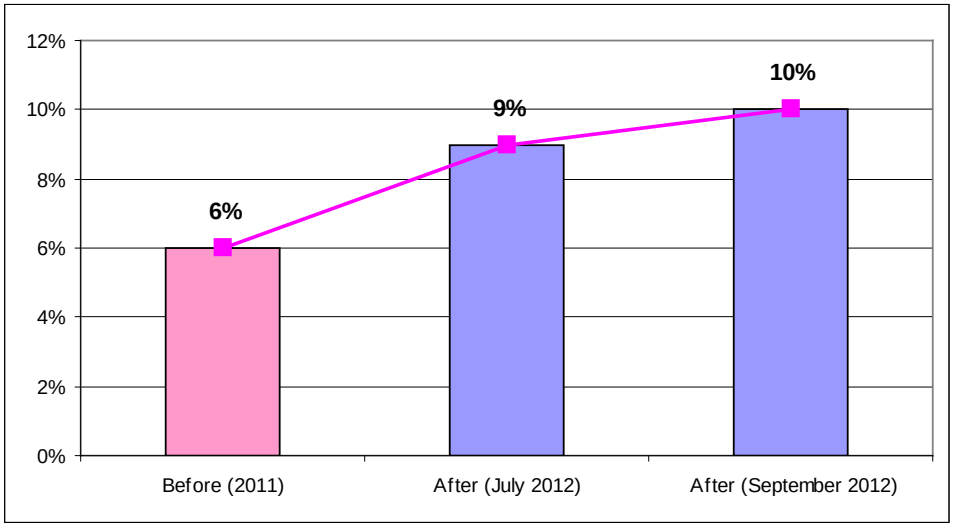


Fig. 13 Acceptance level – positive feedback

On analysing the acceptance level we notice that the percent of the interviewees who think that this measure has improved the efficiency of public transport (points 1 and 2) increased to 10% in September 2012, which is 4% more than the percentage of 2011 (Fig. 13).

C2.6 Cost benefit analysis

C2.6.1 Evaluation period for the CBA

- Defining reference case for the CBA

The reference case corresponds to the BaU scenario, where no investments in a GPS tracking system, in a maintenance facility centre, and in modules for incident management are made. This situation is the same for the "before" data. For details see Section C1.3 – Methods for business as usual scenario.

- Defining lifetime of the measure

  The evaluation period is 5 years, which is the equipment lifetime recommended by the supplier.

- Discount rate

  Following EU recommendations a discount rate of 3.5% is used for the analysis.

C2.6.2 Method and values for monetisation

- Description of how the impacts are monetised

The main parties involved in this measure and the way they influence its impact are summarised in the following table, which highlights how each influences costs and benefits.

Agents	Costs	Benefits
Public transport operator	Operating costs Maintenance costs	
Local authorities	Investment (capital) costs	More attractive public transport system
Public transport users		The increased quality of public transport service, associated with the accuracy of timekeeping leads to time saving. Improvement of the image of public transport(1)

(1) Difficult to assess: omitted.

- References of values used

The values of the economic indicators and the monetisation of the accuracy of timekeeping in the base year, used in the cost-benefit analysis were calculated above and are summarised here: (Table 6)

Indicator (Year 1)	B-a-U	After
Capital costs	0	110,340 €
Operating costs	108,414 €	10,320 €
Maintenance costs	2,116 €	1,530 €
Accuracy of timekeeping	0	1,194,580 €

Table 6 – Indicators used in the CBA

The annual values of the economic indicators are updated with the annual inflation rate for energy, fuel, urban transport, railway transport, etc. This rate was published by INS (the National Institute of Statistics) for 2011. The forecasting for 2012-2014 was made by BNR (the National Bank of Romania). Our estimation for the period 20015-2016 has not been mentioned within the public sources of BNR yet (Table 7).

	INS	BNR			Our estimations	
Annual inflation rate	2011	2012	2013	2014	2015	2016
	5.79%	5.32%	6.89%	6.60%	6.60%	6.60%

Table 7 – The annual evolution of the inflation rate

In order to monetise the accuracy of timekeeping we are taking the following into consideration:

Before the implementation of the measure 88% of the roundtrips were according to the schedule, i.e. 12% were not within the schedule.
After the implementation of the measure 92% of the roundtrips were according to the schedule, i.e. 8% were not within the schedule.

We study the impact on time keeping of the percentages of the roundtrips that were/are not within the schedule. A roundtrip is considered to be within the schedule if it is not delayed more than 1 minute compared to the schedule. After having analysed the data received from the traffic department of the transport company, we drew the conclusion that most of the delays are between 3 and 5 minutes, and, taking into account the accepted one-minute delay, we consider that the average delay is 3 minutes.

We use the timetable of the 100 GPS-tracked means of transport (64 buses and 36 trams) in relation to the type of the day of operation (working day/weekend) in order to obtain the number of late arrivals in the two situations (Table 8):

trips / day		Scheduled (100%)	Late arrivals		No. of "gained" trips
			Before	After	Difference Before - After
			12 %	8 %	
Bus	working day	1468	176	118	58
	weekend	948	114	76	38
Tram	working day	314	38	26	12
	weekend	308	36	24	12

Table 8 - Number of late arrivals

From the data provided by the traffic department of the public transport company we use the number of "gained" roundtrips, the total number of passengers per roundtrip in each type of vehicle according to the type of the day (working day/weekend), and the average of 3 minutes (0.05 hours) of recovered time (Table 9) in order to obtain the daily number of passengers who benefit from time saving.

		No. of "gained" trips	Average no. of passengers per vehicle	Time saving per trip	Daily no. of passengers who benefit from time saving
		(trips*)	(passengers/vehicle)	(hours)	(passengers*hours)
Bus	working days	58	67	0.05	194
	weekends	38	43.5	0.05	83
Tram	working days	12	57	0.05	34
	weekends	12	37	0.05	22

Each trip is considered to be made by a public means of transport (bus/tram)
Table 9 – Daily number of passengers who benefit from time saving

We then calculate the total number of passengers who benefit from time savings according to the type of the day, and we transposed the result into annual values (Table 10).

	Daily no. of passengers who benefit from time saving	No. of days / year	Annual no. of passengers who benefit from time saving
Working day	228	260	59,280
Weekend	105	105	11,025

Table 10 – annual no. of passengers who benefit from time saving

The annual number of passengers who benefit from time saving and the values recommended by HEATCO 2 (Table 11) were used to obtain the annual benefit from time saving.

	Annual no. of passengers who benefit from time saving (passengers*hours)	Unit value (HEATCO) (€ / (passenger per hour))	Annual benefit from timesaving (€)
Working days	59,280	19.11	1,132,840
Weekends	11,025	5.60	61,740
		Total:	1,194,580

Table 11 – Monetisation of accuracy of time keeping

The unit values of the estimated time saving come from HEATCO 2006 (the values are included in the CBA Recommendations for the CIVITAS Evaluation) in the context where the working day has been assimilated with work-trips, and the weekend has been assimilated with non-work trips (5.6 € / passenger / trip hour is the average of the value corresponding to the trips by bus on commute-short distance, 6.10 €, and the value corresponding to other-short distances, 5.11 €, which are associated to the EU-25 countries).

If we take on the above-described scenario, together with its intrinsic risks, a time saving of 1,194,580 € per year is realised.

The risks of monetisation are generated by the extrapolation of the accuracy of timekeeping recorded within two months to the whole year, and by converting the accuracy of timekeeping into time saving, along with transposing the unit values for monetisation – euro/passenger/trip (according to HEATCO) – from EU level to national level and with the evolution of inflation.

C2.6.3 Lifetime cost and benefit

Table C2.6.1 Capital cost in the evaluation period (not discounted)

	Cases for comparison	Cost (€)
Year 1	CIVITAS measure	194,626
	Reference case (or BAU)	0
Year 2	CIVITAS measure	0
	Reference case (or BAU)	0
Year 3	CIVITAS measure	0
	Reference case (or BAU)	0
Year 4	CIVITAS measure	0
	Reference case (or BAU)	0
Year 5	CIVITAS measure	0
	Reference case (or BAU)	0

Table C2.6.2 Operation cost in the evaluation period (not discounted)

	Cases for comparison	Values (e.g. €200,000)
Year 1	CIVITAS measure	19,104
	Reference case (or BAU)	62,772
Year 2	CIVITAS measure	20,120
	Reference case (or BAU)	66,111
Year 3	CIVITAS measure	21,507
	Reference case (or BAU)	70,667
Year 4	CIVITAS measure	22,926
	Reference case (or BAU)	75,331
Year 5	CIVITAS measure	24,439
	Reference case (or BAU)	80,302

Table C2.6.3 Maintenance cost in the evaluation period (not discounted)

	Cases for comparison	Values (e.g. €200,000)
Year 1	CIVITAS measure	4,404
	Reference case (or BAU)	N / A
Year 2	CIVITAS measure	4,638
	Reference case (or BAU)	N / A
Year 3	CIVITAS measure	4,958
	Reference case (or BAU)	N / A
Year 4	CIVITAS measure	5,285
	Reference case (or BAU)	N / A
Year 5	CIVITAS measure	5,634
	Reference case (or BAU)	N / A

Table C2.6.4 Savings from journey time saving in the evaluation period (not discounted)

	Cases for comparison	Values (e.g. €200,000)
Year 1	CIVITAS measure	1,194,580
	Reference case (or BAU)	N / A
Year 2	CIVITAS measure	1,258,132
	Reference case (or BAU)	N / A
Year 3	CIVITAS measure	1,344,817
	Reference case (or BAU)	N / A
Year 4	CIVITAS measure	1,433,575
	Reference case (or BAU)	N / A
Year 5	CIVITAS measure	1,528,191
	Reference case (or BAU)	N / A

Table C2.6.5 Lifetime cost/benefit of CIVITAS measure (discounted)

	Capital cost (€)	Operation cost (€)	Maintenance cost (€)	Savings from Journey time savings	Total cost (€)	Total Benefit (€)	Cumulated Cost (€)
Year 1	194,626	19,104	4,404	1,194,580	218,134	1,194,580	-976,446
Year 2	0	19,440	4,481	1,215,586	23,921	1,215,586	-1,191,665
Year 3	0	20,077	4,628	1,255,401	24,705	1,255,401	-1,230,696
Year 4	0	20,678	4,767	1,293,002	25,445	1,293,002	-1,267,557
Year 5	0	21,297	4,910	1,331,730	26,207	1,331,730	-1,305,523
Total	194,626	100,596	23,190	6,290,299	318,412	6,290,299	-5,971,887

Table C2.6.6 Lifetime cost/benefit of the reference measure/case (discounted)

	Capital cost (€)	Operation cost (€)	Maintenance cost (€)	Savings from Journey time savings	Total cos (€)	Total Benefit (€)	Cumulated Cost (€)
Year 1	0	62,772	0	0	62,772	0	62,772
Year 2	0	63,876	0	0	63,876	0	63,876
Year 3	0	65,968	0	0	65,968	0	65,968
Year 4	0	67,944	0	0	67,944	0	67,944
Year 5	0	69,979	0	0	69,979	0	69,979
Total	0	330,539	0	0	330,539	0	330,539

C2.6.4 Summary of CBA results

For the summary of the CBA results the changes in benefits and costs between the two scenarios are assessed.

Discounted cash flow

	Changes in total cost (€)	Changes in total benefit (€)	Net cash flow (€)	Cumulative cash flow (€)
Year 1	155,362	1,194,580	1,039,218	1,039,218
Year 2	-39,954	1,215,586	1,255,541	2,294,759
Year 3	-41,263	1,255,401	1,296,664	3,591,423
Year 4	-42,499	1,293,002	1,335,501	4,926,924
Year 5	-43,772	1,331,730	1,375,502	6,302,426
Total	-12,126	6,290,299		

Changes in NPV (€):+ 6,290,299

This NPV, together with the benefit-cost ratio (BCR = 518; BCR value > 1) shows that the benefits of this measure are much higher than the initial capital costs and the operating and maintenance costs, if we assume the hypotheses present in describing the BaU scenario and the monetisation of time saving.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	Implementation of a GPS tracking system on 100 public means of transport	★★
2	Setting up a maintenance facility centre	★★
3	Introduction of a management of incidents system	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

C4 Upscaling of results

The bus management system that monitors 100 public transport vehicles can be extended to the entire fleet of the public transport company and to the fleets of private transport operators. This implies investments in equipment and in training the staff to operate and maintain these systems.

A comparative analysis of passengers' perception regarding the advantages of the bus management system (setting up/keeping timetables) will create the premises to extend this measure.

C5 Appraisal of evaluation approach

The cost-benefit analysis required that some assumptions are made for evaluating these indicators. For instance:
- we converted the accuracy of timekeeping into time saving;
- the timekeeping indicator for 2012 was determined for only two months (July and September), and the result was extrapolated for the whole year;
- for the monetisation of time saving, the values from the HEATCO guide valid in EU member states were used (euro/passenger/trip); unfortunately, these values date from 2006, when Romania was not a member of the UE;
- for the cost-benefit analysis the evolution of the inflation was estimated for the years 2015 and 2016;

- the accuracy of timekeeping, which was used as a baseline, was determined on a single route along the CIVITAS corridor, and was generalised to all GPS-tracked public means of transport;
- we assumed that during the project lifetime the accuracy of timekeeping remained constant.

If we were to evaluate the measure again from the beginning:
- we would make the surveys on a larger sample and in different areas of the city where GPS-tracked public means of transport run;
- we would collect data after a longer period of time after the measure has been implemented; thus the results would be more relevant than the results obtained after extrapolating the data we have got after only two months of operation.

C6 Summary of evaluation results

The results we got after evaluating the indicators specific to this measure are as follows:

- the quality of service indicator increased from 26% in 2011 to 32% in July 2012 and to 35% in September 2012, which shows that the respondents became more and more satisfied with the effects of the measure;
- on analysing the results of the questionnaires, we notice that the awareness level of the respondents who had heard about the project and about this measure increased by 8%, from 30% in 2011 to 38% in September 2012;
- the percent of the respondents who think that the public transport service has improved thanks to the GPS vehicle tracking system and to the incident management system increased from 6% in 2011 to 10% in September 2012;
- the accuracy of timekeeping indicator, which was determined with the help of the GPS tracking system, shows an increase of the arrivals of vehicles at stops on time up to the value of 92%, which is 4% more than that in 2011;
- the net present value is extremely high, + 9,613,724 €, because operating costs have dropped; however, the greatest influence was that of the time saving recorded once this measure has been implemented: 4%.

C7 Future activities relating to the measure

The systems implemented through this measure will be connected to the Traffic Management System project, co-financed by European Commission as part of the Regional Operational Programme, which will be implemented in the entire city.

D Process Evaluation Findings

D.0 Focused measure

	0	No focused measure
2	1	Most important reason
3	2	Second most important reason
4	3	Third most important reason

D1 Deviations from the original plan

Initially, in the DoW, Measure 76 was about implementing a GPS-based AVL and fleet management system and installing GPS equipment in 75 public means of transport (buses and trams). This measure was interconnected from a technical viewpoint to the old Measures 13 (Improved public Transport Information) and 12 (Improved Ticketing). A single tender was organised in order to get a coherent system composed of three compatible subsystems. The tender was cancelled twice because the legislation was changed twice, and this led to a modification of the procedure documentation.

Consequently, the European Commission was asked to change Measure 76 so that GPS equipment could be installed in 100 public means of transport, the vehicles could be supervised by means of the fleet management sofware within the maintenance facility centre, and an incident management system could be introduced. The EC accepted this proposal, hence the whole evaluation procedure had to be changed in order to adapt it to the new Measure 76.

D2 Barriers and drivers

D2.1 Barriers

Preparation phase

- **6. Positional:** There were hardly any companies in Romania specialised in GPS tracking systems designed especially for public transport.
- **6. Positional:** Since the public transport company in Iasi had no experience with GPS tracking systems, information was needed in order for the measure persons to be able to elaborate the tender documentation properly.

Implementation phase

- **11. Spatial and 8. Organisational:** The main dispatch centre had to be completely reorganised: both the work area layout, as well as the activities of the staff.
- **10. Technological:** The means of transport had to be adapted for the installation of the GPS equipment.

Operation phase

- **5. Involvement, communication:** Some of the staff working at the dispatch centres located at the end stops of each public transport route were worried they would lose their jobs.
- **10. Technological:** The vehicle tracking software had not been developed especially for public means of transport.

D2.2 Drivers

Preparation phase

- **1. Political/strategic:** The determination of local authorities, alongside with that of the public transport company to set up timetables for the public transport routes as accurately as possible

and to help the drivers of public means of transport observe them to a greater extent than before has helped in the implementation of this measure.

Implementation phase

- **8. Organisational:** Although the transport company had no experience with GPS tracking systems, there were a few employees whose interest in new technologies made them learn quickly how to handle the system.

Operation phase

- **5. Involvement, communication:** The people assigned to this project from the company who won the tender were open to adapting their software to the needs of the public transport company.
- **10. Technological:** The staff of the public transport company working in the main dispatch centre found the new systems very helpful and they are using them to their full potential.

D.2.3 Activities

Preparation phase

- **4. Problem related:** The public transport company gathered information on GPS tracking systems for public transport.
- **12. Other:** Based on the data acquired the tender documentation was elaborated.

Implementation phase

- **11. Spatial:** The room where the main dispatch centre is located was completely reorganised.
- **10. Technological:** The 100 means of transport were adapted for the installation of the GPS equipment and the components were mounted. The incident management system was installed within the main dispatch centre.

Operation phase

- **10. Technological:** The experience that the measure persons and the staff working with the fleet management software have acquired during the implementation and the operation of the vehicle tracking system let them identify some functions that would have been helpful in managing the fleet better. The measure persons explained the persons assigned for this project from the company who won the tender what improvements should be made to the software in order to better adapt it for the needs of a public transport company, and the software developers implemented the requirements.

D3 Participation of stakeholders

D3.1 Measure Partners

- **City of Iasi (Leading Role)**
  - responsible for preparing the documentation and the tender and for signing the contract for the GPS management system;
  - responsible with organising meetings with the public transport company and with the supplying company for setting the details about the implementation of the system.

- **Supplying Company (Principle participant)**
  - responsible for delivering the equipment for the GPS management system;
  - responsible with organising meetings with the public transport company for the installation of the GPS modules on the public means of transport and of the equipment for the maintenance facility centre;

- responsible with organising training sessions with the staff of the public transport company in order to instruct them about using the software applications for the GPS tracking system and for the incident management system;
- responsible with organising training sessions with the staff of the public transport company in order to instruct them about the maintenance of the GPS tracking system;
- responsible with ensuring the functionality of the system mounted on the vehicles.

- **The public transport company (Occasional participant)**
- participated in the meetings with the Municipality of Iasi and with the supplying company to set the strategy for the implementation of the measure;
- made available the means of transport for the installation of the GPS equipment;
- responsible with setting up the maintenance facility centre;
- ensured the technical support for mounting the GPS modules on the public means of transport and the equipment of the maintenance facility centre;
- participated in training sessions for learning the maintenance operations and how to use the software applications;
- responsible with monitoring the GPS-tracked public means of transport;
- responsible with monitoring and recording complaints with the help of the incident management system;
- responsible for collecting all indicators to assess the impact of the measure.

- **Technical University Iasi (Occasional participant)** – participated in organising surveys and face-to-face interviews for the assessment of the measure.

D3.2 Stakeholders

- **Passengers** – all people who use GPS-tracked public means of transport benefit from their punctuality. On the other hand, thanks to the incident management system claimants receive answers in less time than before.
- **Media** – the articles in the audio and written press may contribute to the increase of the degree of success of the measure among citizens.
- **The public transport personnel** – drivers can now observe the timetables in most cases.
- **The public transport company** – the 100 public means of transport are now tracked with high accuracy, and corrections with respect to their operation can easily be made so that they stay within the timetable. Moreover, the fleet management software can generate reports that help improving transport services. The software application for managing incidents facilitates the circulation of complaints between the departments responsible for solving them; thus they are solved quicker, and both the transport company and the claimants benefit therefrom. Complaints are easier to manage now that a software application is available, and, if necessary, reports can be generated.

D4 Recommendations

D.4.1 Recommendations: measure replication

- **Advantages.** The implementation of the GPS tracking system and of the incident management system brings the following benefits:
  - tracking vehicles in real time allows for optimal scheduling of the public transport fleet, and for applying corrections according to traffic conditions;
  - this system can be interconnected with other systems that improve public transport quality:

- real-time information panels in stops and inside vehicles, which inform passengers about waiting times, sequence of stops, connections to other routes, general issues of interest
- the integration with the ticket validation system offers information on the number of tickets validated on certain segments of routes and during certain time intervals;

- allows for following each step of the investigation of an incident from the moment of receiving the complaint until the investigation is finished.

These advantages give this measure a high potential of transferability to other cities because it has an impact both on passengers and on the transport operator, since the goal of the measure is to improve public transport services.

For the successful implementation of this measure it is recommended that

- all decision-making factors (political, administrative, economic, technical, operational, etc.) with direct impact on the implementation of the measure should work together;
- it is interconnected with other measures (dedicated lane for public transport, priority at traffic lights), which adds to the success of the implementation of this measure.

D.4.2 Recommendations: process

- **Solving technical issues.** The implementation of such a system means having to solve many hardware and software-related issues, which, if not handled, can create problems. Therefore, the implementation process must be very well organised, and the beneficiary and the supplier should work together until everything runs smoothly.

- **Learning to use the software applications**. Both the GPS tracking system and the incident management system are operated by means of software applications. Part of the staff may have difficulties in learning how to use them. Training sessions should therefore be organised so that all employees involved in the process understand and assimilate each function of the software applications.

- **Maintenance**. Special attention should be given to the maintenance of the two systems. The maintenance team must be instructed properly so that all problems that may appear are solved as rapidly as possible, since their negative impact is usually reflected on users of public transport.

ANNEX 1

GPS tracking system and maintenance facility centre – technical details

The GPS tracking system implemented within this measure has the following components:

1. SafeFleet X700 equipment – GPS hardware equipment including a General Packet Radio Service (GPRS) modem, which was installed on each vehicle. The system reads such information as location and speed of vehicles and then, with the help of a GPS receiver having 20 channels, calculates the corresponding number of kilometres. The system has a GSM antenna, USB, RS-232 serial, CAN and 1-Wire ports. The information received from the X700 equipment (position, speed, events, alarms, etc.) is managed by the SafeFleet Portal software application to allow the client to view data in real time and to generate reports and statistics..

2. Fuel flow meter – fuel flow is controlled via Hall effect sensors.

3. SafeFleet Portal software application – a stand-alone software application which offers an interface for tracking public means of transport in real time and then generates detailed reports. The software application can be accessed online through an updated web browser (Microsoft Internet Explorer, Mozilla Firefox, Google Chrome or Opera), from either desktop units or portable units that have an internet connexion: notebooks, tablets, or even smartphones.

The SafeFleet Portal software application uses the latest vector maps (see Fig. A1) that cover both national and international territories.

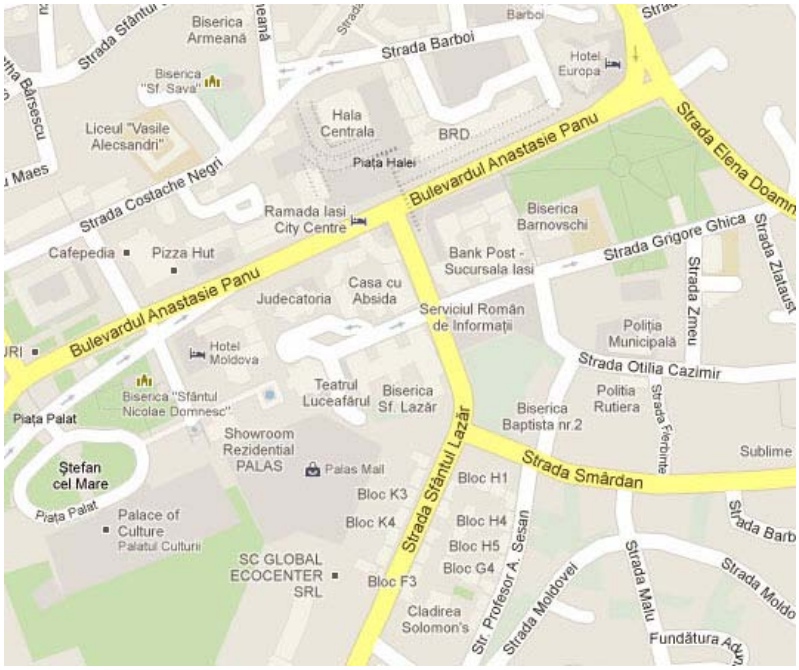


Fig. A1 Iasi vector street map

The application can be accessed through an HTTPS secure web interface using an ID and a password. Each item of the GPS equipment has a SIM card embedded in it and sends the recorded data using mobile telephone network (GSM/GPRS). SafeFleet Portal software application can locate any monitored vehicle with a precision of less than 10 meters. The vehicles are displayed both on the vector map and in tabular form containing the address of the location or the Hot Spot.

With the SafeFleet system all the data of a certain bus can be gathered into a centralised form containing: type of vehicle, registration number, weight, average fuel consumption, total number of kilometres recorded, etc. (Fig. A2).

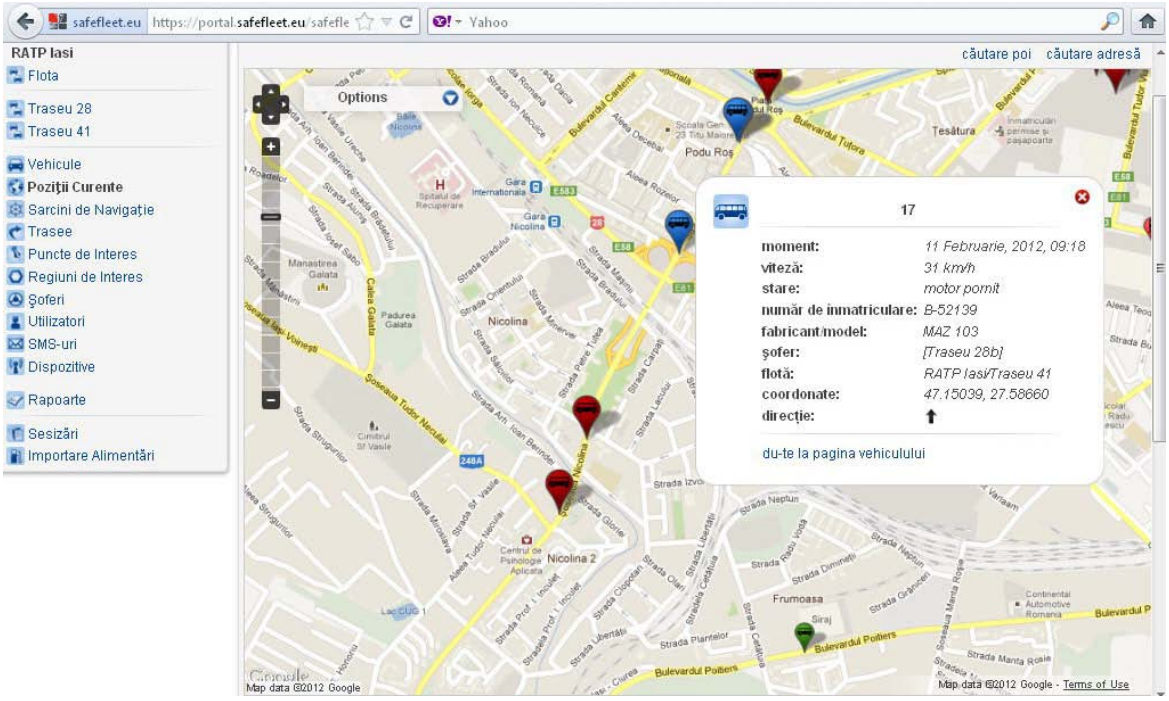
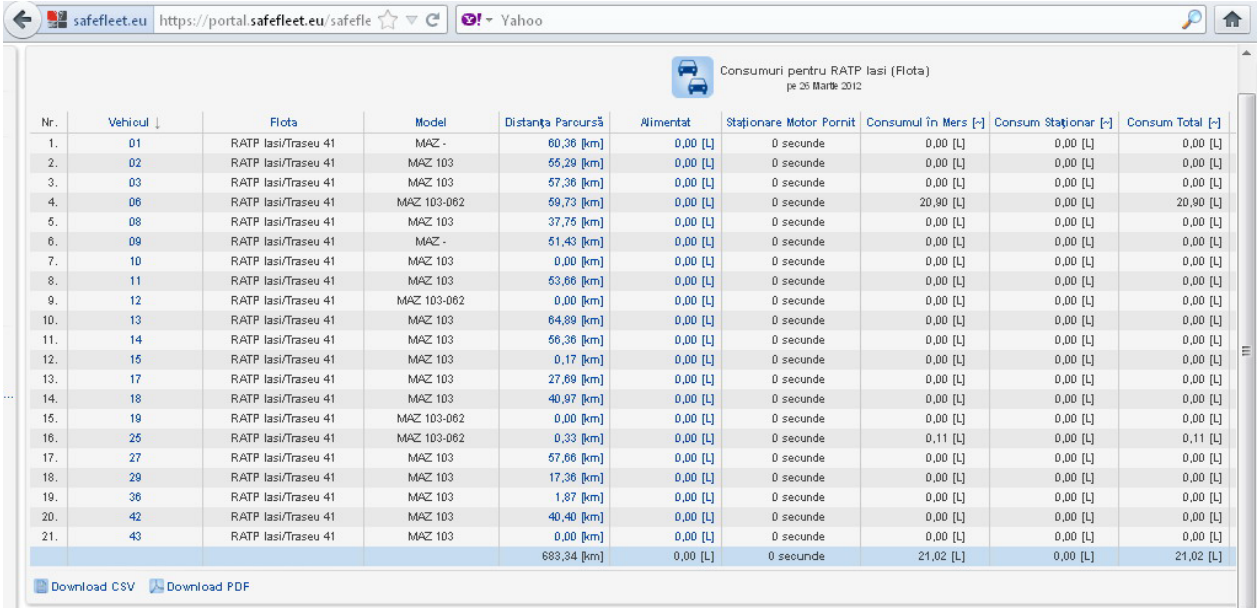


Fig. A2 Real time information on location and other data of the bus

The SafeFleet system is capable of interfacing with a vehicle's on-board computer using the Fleet Management Systems (FMS) communication standard. One data type read from on-board computers in buses through the FMS interface is the total fuel used (TFU) starting with the first ignition of the engine. This parameter is counted each time a litre of fuel is used. Based on this, the parameter can be read at the beginning and at the end of a journey and, by a simple calculation, the real fuel consumption for a certain distance can be obtained (Fig. A3).



Nr.	Vehicul	Flota	Model	Distanța Parcursă	Alimentat	Staționare Motor Pornit	Consumul în Mers [~]	Consum Staționar [~]	Consum Total [~]
1.	01	RATP Iasi/Traseu 41	MAZ -	60,36 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
2.	02	RATP Iasi/Traseu 41	MAZ 103	55,29 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
3.	03	RATP Iasi/Traseu 41	MAZ 103	57,36 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
4.	06	RATP Iasi/Traseu 41	MAZ 103-062	59,73 [km]	0,00 [L]	0 secunde	20,90 [L]	0,00 [L]	20,90 [L]
5.	08	RATP Iasi/Traseu 41	MAZ 103	37,75 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
6.	09	RATP Iasi/Traseu 41	MAZ -	51,43 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
7.	10	RATP Iasi/Traseu 41	MAZ 103	0,00 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
8.	11	RATP Iasi/Traseu 41	MAZ 103	53,66 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
9.	12	RATP Iasi/Traseu 41	MAZ 103-062	0,00 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
10.	13	RATP Iasi/Traseu 41	MAZ 103	64,89 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
11.	14	RATP Iasi/Traseu 41	MAZ 103	56,36 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
12.	15	RATP Iasi/Traseu 41	MAZ 103	0,17 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
13.	17	RATP Iasi/Traseu 41	MAZ 103	27,69 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
14.	18	RATP Iasi/Traseu 41	MAZ 103	40,97 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
15.	19	RATP Iasi/Traseu 41	MAZ 103-062	0,00 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
16.	25	RATP Iasi/Traseu 41	MAZ 103-062	0,33 [km]	0,00 [L]	0 secunde	0,11 [L]	0,00 [L]	0,11 [L]
17.	27	RATP Iasi/Traseu 41	MAZ 103	57,66 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
18.	29	RATP Iasi/Traseu 41	MAZ 103	17,36 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
19.	36	RATP Iasi/Traseu 41	MAZ 103	1,87 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
20.	42	RATP Iasi/Traseu 41	MAZ 103	40,40 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
21.	43	RATP Iasi/Traseu 41	MAZ 103	0,00 [km]	0,00 [L]	0 secunde	0,00 [L]	0,00 [L]	0,00 [L]
				683,34 [km]	0,00 [L]	0 secunde	21,02 [L]	0,00 [L]	21,02 [L]

Fig. A3 Graphic reports on fuel consumption

ANNEX 2

Examples of media reactions:

http://www.bzi.ro/ratp-pregateste-montarea-gps-urilor-pe-autobuze-251677

http://www.bzi.ro/o-suta-de-mijloace-de-transport-au-fost-echipate-cu-gps-256587

http://www.stiriazi.ro/ziare/articol/articol/sisteme-gps-si-camere--in-mijloacele-de-transport-in-comun-in-iasi/sumar-articol/52461644/

http://www.administratie.ro/articol.php?id=39278

ANNEX 3

Questionnaire – after situation

M 76 – Bus Management System

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Profession _____.
4. Latest school attended _____.
5. When I go by public means of transport, I prefer to use a:
   □ one-trip ticket □ two-trip ticket
   □ set of 10 trips □ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally...)
   _____

7. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union?
   □ yes □ no □ I don't know

8. Has the public transport company, as a part of the CIVITAS project, implemented a GPS tracking system on 100 public means of transport?
   □ yes □ no □ I don't know

9. Has the public transport company, as a part of the CIVITAS project, installed an incident management system for handling – among others – special occurrences in traffic, requests, suggestions and complaints from passengers received by phone, fax, and e-mail, etc.?
   □ yes □ no □ I don't know

10. To what extent do you agree with the following statements (within a scale from 1 to 5, where 1 has the meaning "total disagreement" and 5 "total agreement"):

The public transport company has an efficient fleet tracking system.	1 2 3 4 5
Public means of transport observe the timetables.	1 2 3 4 5
The GPS tracking system of buses and trams contributes to the improvement of public transport services.	1 2 3 4 5
The new incident management system contributes to the improvement of public transport services.	1 2 3 4 5

11. The idea of implementing a GPS tracking system for monitoring public means of transport is:
□ very good □ good □ neither good nor bad □ bad □ very bad

12. The idea of introducing an incident management system is:
□ very good □ good □ neither good nor bad □ bad □ very bad

13. Would the implementation of a surveillance system for all public means of transport help drivers observe the timetables to a greater extent?
   □ yes □ no □ I don't know

14. To what extent are you satisfied with the following aspects of the public transport services?

	very satisfied	satisfied	almost satisfied	disatisfied	very dissatisfied
the traffic flow of public means of transport	□	□	□	□	□
the frequency of arrivals at stops of public means of transport	□	□	□	□	□
the extent to which the timetables are observed	□	□	□	□	□
how passengers' complaints and requests are answered	□	□	□	□	□
the transport services provided by the public transport company in general	□	□	□	□	□

15. Have you got any suggestions for improving the information system of the public transport company?

.

Thank you!

Executive summary

The Municipality of Iasi initiated the creation of a website that would gather all information related to transport in and from Iasi in one place. The site has been conceived as an all-including tool both for the inhabitants of Iasi, as well as for people coming to Iasi, that would help them plan their trips ahead of time and find their way in the city if they chose to use public means of transport.

All companies that provide transport services in Iasi (by bus, tram, minibus, railway, taxi, coach, airplane, rented car) were contacted by the Municipality of Iasi, and meetings were organised with representatives of those companies that expressed their interest in extending their virtual presence on the web. The information collected from them on the services they provide was placed in the corresponding sections of the portal. Special emphasis was placed on the transport by tram, bus, and minibus within the city: a transport planner was created to automate trip planning across the city. After the website has been launched, it was advertised at local level by means of radio, TV, press releases, posters and online news.

The measure was evaluated through:

- surveys among the inhabitants of Iasi, with the following results:
  - 61% of the interviewees were aware of the website and its usefulness and of the CIVITAS project in 2011, and 65% in 2012.
  - the acceptance level showed that many of the respondents who answered that they had heard of the portal have used it to get information or to plan a journey, with an increase from 67% in 2011 to 70% in 2012.
  - the level of the respondents' satisfaction concerning the easiness they can plan a trip with and the quality of the information offered via this website increased to 41% in 2012 from 33% recorded in 2011.
- the number of website visits has been counted since 2010, therefore we were able to calculate the monthly average number of visits, and we noticed an increase by 71% in 2012 compared to 2011, when 506 visits were recorded.

The following can be regarded as lessons that were learned during the implementation of this measure:

- Transport planners should include all means of transport which run on a schedule in the targeted area. Including into a single website information on all public means of transport which transit a city and on other means of transport as alternatives to public transit speeds up the process of searching the best way to move from one place to another.
- It is not enough just to make information available; in order to ensure easiness of use it is very important how the information is structured. Hence the planning stage is very important in the economy of the development of any interface.
- The information comprised in the website must be monitored and updated periodically.
- The site should be advertised so that potential users find out quicker about its existence.

Once the portal has been created, the accuracy of information has to be constantly monitored and updated when needed. The site should also be constantly advertised – on other websites, inside public means of transport, in newspapers – so that as many people as possible get to know about it and use it.

IAS 77 - Public Transport Planner in Iasi

A Introduction

A1 Objectives and target groups

A1.1 Objectives

The measure objectives are:

(A) High level / longer term:

- To promote a high quality, high efficient and more attractive public transport.

(B) Strategic level:

- To enhance access to information on public transport routes.
- To make public transport more attractive for all people.

(C) Measure level:

- To create a website that comprises information on public transport in Iasi and on modes of transport between the city and other destinations in the country.
- To be able to plan a journey in advance using this portal.
- To improve the quality and reliability of public transport services.

A1.2 Target groups

- all inhabitants of Iasi that have access to the Internet. About 55% of the population of Iasi, i.e. about 170,000 inhabitants, have access to an internet connection, which makes them potential beneficiaries of the portal.
- tourists and other visitors of Iasi

A2 Description

The Municipality of Iasi has created a website where information on transport services in the city and between the city and other locations is provided. The site is divided at informational level into two main sections:

1. a transport planner, which is displayed permanently on the left side of all pages of the site for fast access, together with a small map of the transport lines belonging to the public operator, which enlarges in a new window when clicked on;
2. a section comprising information on different modes of transport people have access to from within the city.

1. The transport planner has the following components:
- a list of stops in alphabetical order from which the starting stop can be selected;
- the same list of stops from which the destination stop can be selected;
- a link which triggers the opening of a page with the route between the two stops, which is displayed both as text as well as graphically.

2. The other section comprises information on the transport services provided by:
- the local public transport operator:
  - list of tram routes

- list of bus routes
- railway operator:
  - list of departures and list of arrivals from/to Iasi comprising the following information:
    - train number
    - train category
    - departure station
    - arrival station
    - arrival time
    - departure time
    - type of carriage
    - temporary restrictions
- companies providing regional transport:
  - company name
  - telephone number for reservations
  - website address
  - routes
  - departure and arrival times at the end stations
- airline companies:
  - company name
  - routes
  - days and times of operation
  - an integrated online application for buying airplane tickets
- taxi companies:
  - company name
  - telephone number
  - Yahoo! Messenger ID
  - website address
- companies for car rental services:
  - company name
  - address
  - telephone number
  - website address

There are also two external links:

- to the site of the Municipality, which is constantly updated with news from Iasi;
- to a site mainly dedicated to tourists, as it provides information on the city.

The link to the portal is: http://www.transportiasi.ro/

A3 Person in charge for evaluation of this measure

Names of persons	Berneaga Ninel - implementation
	Manuel Coniac - evaluation
Name of organization	Iasi, PTI
Direct telephone	+40740253567, +40332409861
e-mail	ninel.berneaga@gmail.com, s_tehnic@yahoo.com

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New conceptual approach** – the concept of journey planning engines is not new, but it represents a novelty for Iasi.
- **Use of new technology/ITS** – information on public transport routes was available before the implementation of this measure, but the new portal automates trip planning for local public transport routes, and it also provides information on all modes of transport in the city and from the city to other locations.

B2 Planning of Research and Technology Development Tasks

B3 Situation before CIVITAS

Iasi, with a population of 263,410 inhabitants in 2011, is the second city of Romania after Bucharest. Iasi is the centre of a wider metropolitan area which has 395,298 inhabitants (47.81 % of the population of the county) and a total surface of 808 square kilometers.

The transport in the city includes the following:

- a public transport operator coordinated by the Local Council, which operates daily 80 buses on 8 routes, 72 trams on 9 routes and 15 minibuses on 2 routes. The average daily number of trips is 370,302.
- a private transport operator, which operates daily 26 buses on 4 routes and 21 minibuses on 2 routes. The routes are at the periphery of the city, and the average daily number of trips is 104,120.
- 9 dispatch centres, which coordinate 1700 taxies.
- 6 companies that offer rent-a-car services.

The transport infrastructure in Iasi is connected to the regional, national and international one through 4 bus stations, 2 railway stations and 1 airport. The number of foreign visitors was 390,388 in 2011.

Each of the above-mentioned operators promoted its services individually, by its own promotion strategies (websites, mass-media, flyers, brochures, etc.). There was no common platform to provide information; there was only dispersed information on different modes of transport in Iasi and from the city to other locations, and there was no planner available for planning journeys by public means of transport in Iasi.

B4 Planning of demonstration tasks

The measure has been implemented in the following stages:

Stage 1: Specification development (*December 2009*) – Representatives of the Municipality of Iasi (including a software developer) and of the public transport company established the structure and design of the website.

First it was agreed on the general type of information the portal should contain, and two distinct general areas of interest were set: public transit within the city (i.e. all tram, bus, and minibus lines operated by RATP, the public transport company of Iasi) and modes of transport between Iasi and other locations.

These two main types of information were then divided into several informational sections:

- the information on public transit should include:
  - a list of tram, bus, and minibus lines
  - a map of these lines
  - a route planner
- the modes of transport between Iasi and other locations should cover:
  - trains
  - regional buses
  - airplanes

Additionally, it was decided that two more complementary modes of transport (complementary both to transport inside the city, as well as between cities) should be included:

- taxis
- rented cars

The following step was to agree on the main design characteristics of the main page. Four compulsory elements were established – the main page had to contain:

- links to each section dedicated to one mode of transport
- the CIVITAS logo
- elements characteristic of the city of Iasi
- blue background colour.

Stage 2: Integration of the compulsory elements into the main page design; main page drafts (*December 2009*) – the software developer from the Municipality of Iasi drafted three design versions, and the same persons as in Stage 1 analysed them and chose the version that was going to be implemented.

Three versions for the design of the main page were drafted while respecting the compulsory elements defined in stage 1; two of the versions were very similar to each other, and the third completely different.

The first two drafts of the main page concentrated their useful (i.e. clickable) area in the centre. The elements specific to the city of Iasi were discretely placed at the bottom of the page (the central building contour is very easy to identify, since it is symbolic of Iasi). Six buttons were defined corresponding to the six choices of transport that had been agreed to be available on the portal (Figures 1 and 2). On clicking a button, the page corresponding to the label of the button opened in the same window. All buttons were further available, but they were rearranged within a vertical and narrower frame on the left of the page, since most of the page was dedicated to the information corresponding to the button clicked (Figure 3). On clicking the button "RATP" all three subsections defined above were supposed to be displayed: the map of trams, bus, and minibus lines, the route planner, and the list of lines operated by RATP, the public transport company of Iasi.

The third draft was organised differently (Figure 4). The main page displayed all the compulsory elements, while adding two more: a link to the site of the Municipality, which is constantly updated with news from Iasi, and one to a site mainly dedicated to tourists, as it provides information on the city. The following elements were available from within any page: the six choices of transport and the link to the site with information of Iasi on top of the page, and the route planner and the map on the left. The other constant elements were a logo of the site (made up of the title of the site – Transport in Iasi (.ro) and the central part of the same building characteristic of Iasi which was used for the first two drafts), the CIVITAS logo, and the logos of the project's partners. Additionally, the main page displayed information on the CIVITAS project, a link to the site of the Municipality of Iasi, and pictures of representative buildings in Iasi and of means of transport.

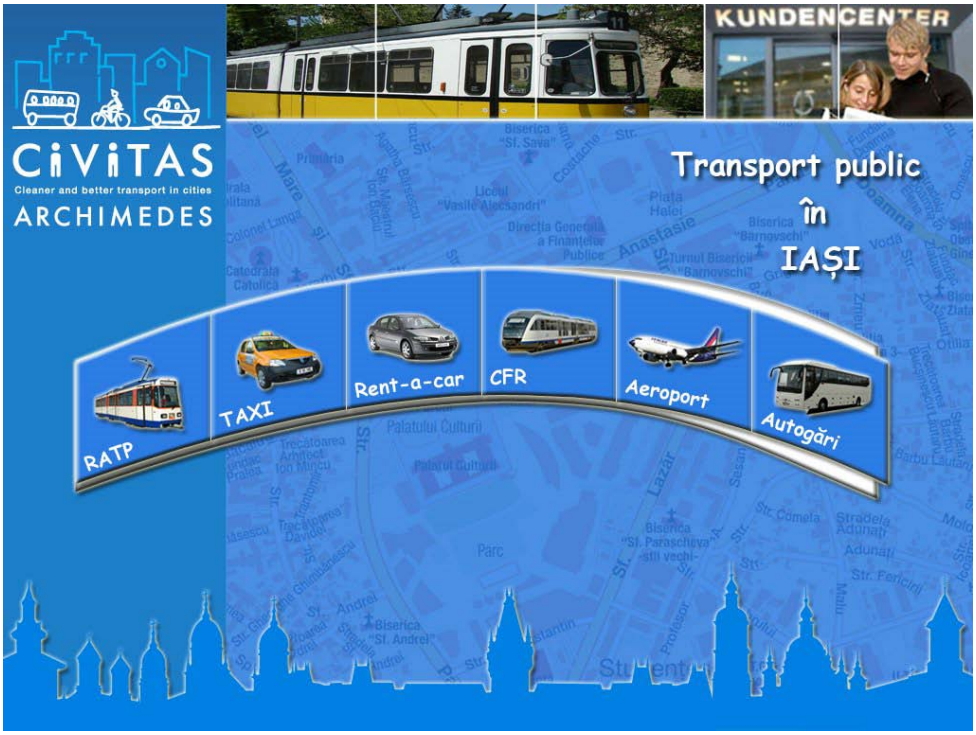


Fig. 1 First draft (main page)

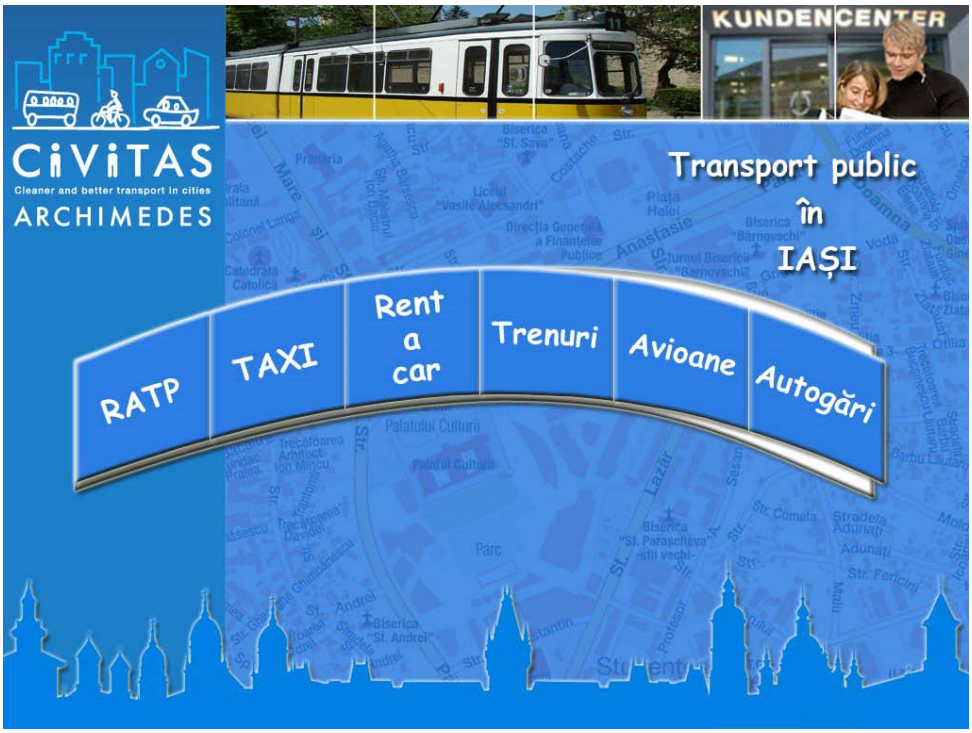


Fig. 2 Second draft (main page)

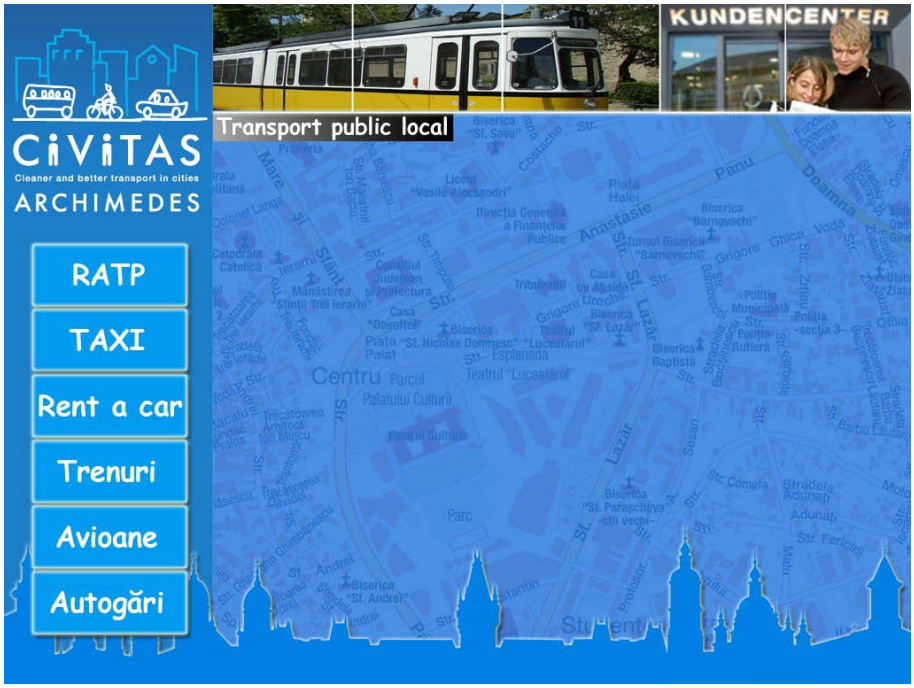


Fig. 3 Second draft (secondary pages)

Fig. 4 Third draft (final version)

After analysing the three drafts, all participants finally agreed to choose the third version for implementation. The route planner was considered to be the most important element of the portal because of its complexity, uniqueness (no other such planners were available for the public transport of Iasi), and usefulness, and therefore its presence on every page (along with that of the map of public transport network) was thought to be a good idea. The design on the whole was considered to be

simple and elegant at the same time. Since no improvements were necessary to the third draft, it became the actual main page of the portal.

Stage 3: Creation of the website (*January 2010*) – the software developer wrote the code behind the site partially based on information provided by the public transport operator, and representatives of the Municipality gathered information for the sections of the portal.

As already mentioned, the most complex and, therefore, difficult part of the website creation was the route planner. The route planner uses a search algorithm to search a graph, whose nodes represent the stops and whose edges represent possible routes between stops. The criterion the search is optimised on is the shortest route. The user must choose an origin from a list of stops and a destination from a second identical list and click on a link for the route to be generated. The route is displayed into a new page in several configurations, as follows (Figure 5):

- as a descriptive text preceded by a bullet for each section of the tram, bus, or minibus lines that the route is composed of; the text has the following pattern: “From the stop [a] take a means of transport on line [b] and get off after having transited [c] stops at the stop [d]”.

- as a sequence of stops grouped after the line the means of transport that transit them are on; the stops are displayed vertically as follows:

Starting stop [x_1]
Stop [x_2]
...
Stop [x_i]
Transfer stop [x_{i+1}]
Stop [x_{i+2}]
...
End stop [x_{i+n}]

where [x_1]...[x_n] are the names of the stops that are transited.

- on a horizontal line, on which each stop is marked with a bullet, under which the name of the stop is written in diagonal (the starting stop, the transfer stops and the end stop are marked with a bigger bullet and are written in bold)

- on a map of the area that comprises the route; the names of the starting stop, of the transfer stops and of the end stop are written on the map and they are marked with a bullet

The map of the public transport network that accompanies the route planner helps users identify the name of the starting stops and of the end stops, and enables them to follow a route once it has been generated by the planner.

De la statia Antibiotice pana in statia Tatarasi Sud

- Din statia Antibiotice luati unul din mijloacele de transport 'Traseul 20' si coborati dupa 12 statii la statia Tg.Cucu
- Din statia Tg.Cucu luati unul din mijloacele de transport 'Traseul 3,Traseul 13' si coborati dupa 5 statii la statia Tatarasi Sud

De la statia Antibiotice pana in statia Tatarasi Sud

Statia start 'Antibiotice'	Liniile 'Traseul 20'
Statia 'Valea Lupului'	
Statia 'Daewoo'	
Statia 'Post Control'	
Statia 'Popas Pacurari'	
Statia 'Rond Pacurari'	
Statia 'Peco OMV'	
Statia 'Cimitirul Evreiesc'	
Statia 'Moara 1 Mai'	
Statia 'Petru Poni'	
Statia 'Blocuri Pacurari'	
Statia 'Spitalul Sf. Spiridon'	
Statia schimb 'Tg.Cucu'	Liniile 'Traseul 3,Traseul 13
Statia 'Padurii'	
Statia 'Ateneu'	
Statia 'Dr. Savini'	
Statia 'Flora'	
Statia destinatie 'Tatarasi Sud'	

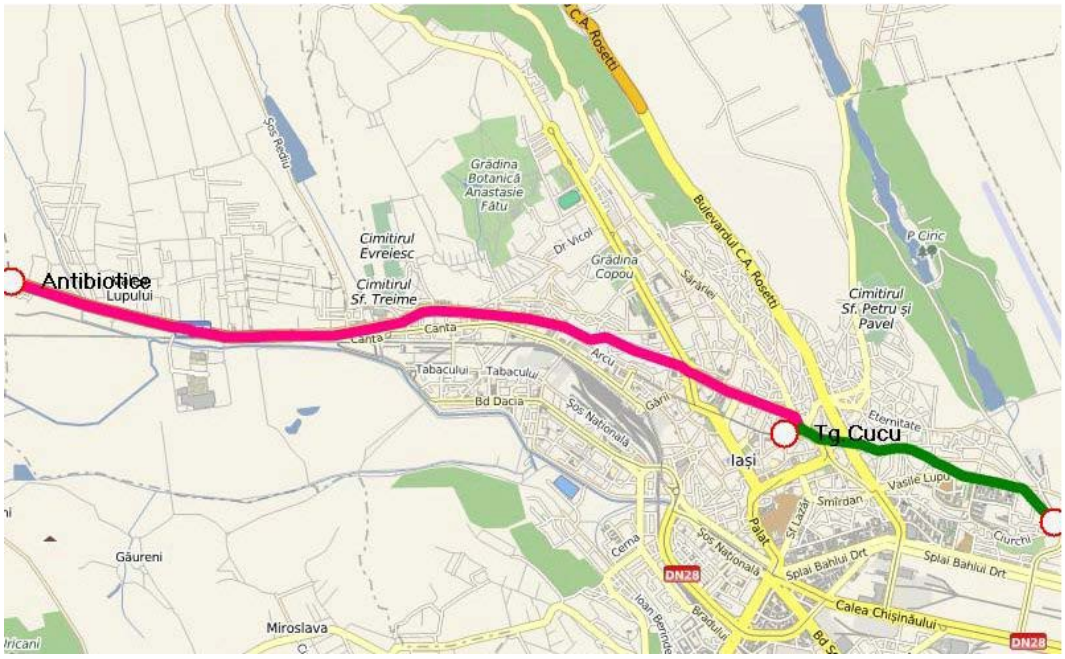


Fig. 5 Route planner – example of a generated route

Representatives of the local public transport company had an important role in the creation of the route planner. Not only did they provide information on lines and stops, but they also gave specific instructions regarding special cases where more than lists of lines and stops was needed. They were also responsible with testing the route planner, with communicating malfunctions, and with explaining them to the software developer, who fixed them as they were signalled.

In parallel to the work of the software developer, representatives of the Municipality contacted all companies that offered transport services in the city and between Iasi and other locations. The goal

was to collect useful information for the five sections dedicated to other modes of transport than those offered by the local public transport operator (Figure 6). Most of the companies answered positively and agreed that information on departure and arriving times (of regional buses, trains, and aeroplanes), as well as contact information (in the case of taxis and car rental services) be listed in the portal. Moreover, the airline company agreed that an application for online ticket reservation be integrated in the website.

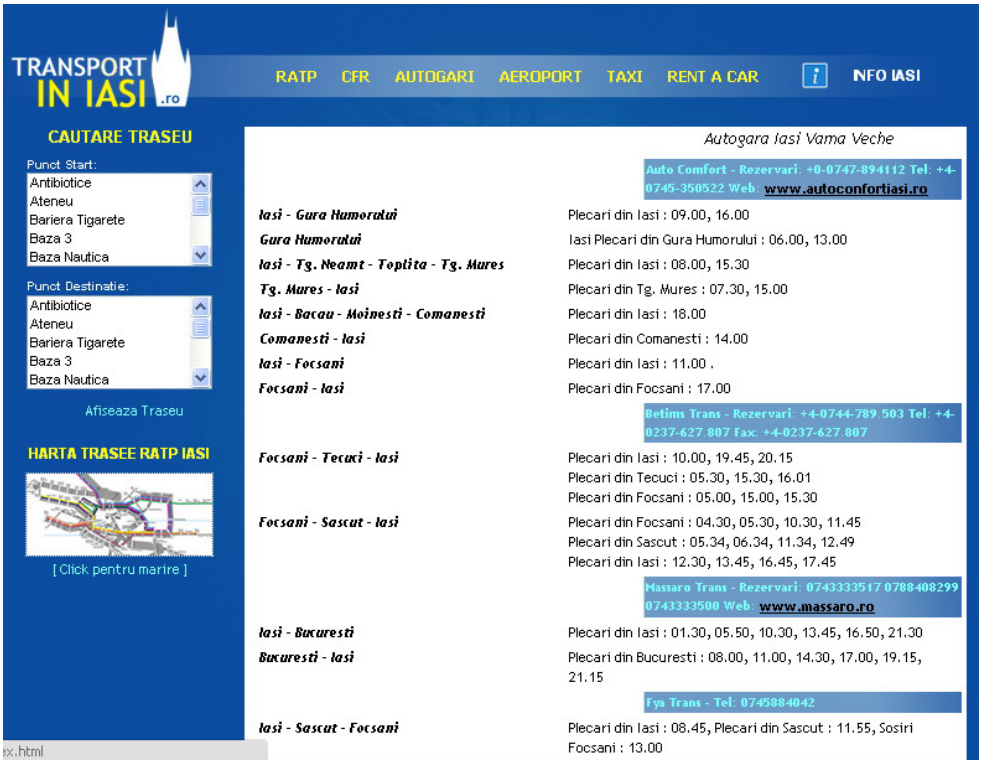


Fig. 6 Schedule of regional buses

Stage 4: Surveys (*February 2011 and February 2012*) **-** Representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi organised surveys in order to evaluate the impact of the website (for more details see sections C1.1.2. and C2).

B5 Inter-relationships with other measures

The measure is linked to all public transport-related measures in Iasi because this portal has been created to encourage people to use public transport as a cleaner alternative to private cars by helping them move through the city, and between Iasi and other locations thanks to information provided on all modes of transport available. This measure is also linked to other similar measures in ARCHIMEDES cities: DSS 73 – Donostia-San Sebastian Bus Traveller Information, AAL 09 – Modernizing Travel Information in Aalborg, BH 71 – Brighton & Hove Personalised Travel Information Website.

C Planning of Impact evaluation

C1 Measurement methodology

C1.1 Impacts and indicators

C1.1.0 Scope of the impact

This measure made it possible to create a portal that gathers in one place all information related to transport in the city and from Iasi to other locations. All people having access to an internet connection (inhabitants of Iasi as well as visitors) are thus able to plan they journeys in advance. The impact of this measure is at society level because it is addresses a large number of citizens. This portal is yet another aspect of the public transport service which has been improved – that related to information – which has an impact on public transport as a whole.

C1.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
	ECONOMY					
2b			Capital Costs	Capital costs	Costs of implementing the measure	Euro
2c			Maintenance costs	Maintenance costs	Costs for implemented measure maintenance	Euro
	SOCIETY					
13		**Acceptance**	Awareness	Awareness level	Survey	Index(%)
14			Acceptance	Acceptance level	Survey	Index(%)
	TRANSPORT					
19		**Quality of Service**	Quality of service	Quality of service	Survey	Index(%)
	NEW			Users	Number of site accessing	Counted

C1.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
2b	Capital Costs	1301 €	labour costs of the Municipality of Iasi with the employee who created the website	–
2c	Maintenance costs	As low as possible	the labour costs of the employee who updates the website	Monthly
2	Operating costs*	As low as possible	result from the amount per month spent for hosting the website	Monthly
13	Awareness level	Increased level of awareness	After the implementation of the measure surveys were conducted to assess these indicators. The interviews** were carried out by students in a public transport stop during five working days both in 2011 and in 2012. 100 persons were interviewed in each of the two years. **February 2011 and February 2012.** For the assessment of the awareness level, the respondents were asked if they had heard about the CIVITAS project and if they had known that a website was created to enable people to plan in advance their journeys. In order to assess the acceptance level indicator, the interviewees were asked if they used this portal for planning their journeys. For the evaluation of the quality of service indicator the level of peoples' satisfaction regarding the following issues was targeted: how easy was for them to obtain information about public transport services in general, if they could easily plan a journey in advance, if the information offered by this website was useful.	After - February 2011 and February 2012
14	Acceptance level	Increased level of acceptance		
19	Quality of service	Increased		
NEW	Users	1000 accessing per month	Counting the no. of site accesses	Annually

* The "operating costs" indicator was included.
** The questionnaire is to be found in Annex 2.

C1.1.3 Planning of before and after data collection

EVALUATION TASK	INDICATORS INVOLVED	COMPLETED BY (DATE)	RESPONSIBLE ORGANISATION AND PERSON
Baseline data collection	All indicators	Not applicable	
Collection of after data	All indicators	M30, M42	Iasi, PTI
D12.2 Baseline and first results from data collection	All indicators	Month 34	Cristian Stoica
D12.3 Draft results template available	All indicators	Month 49	
D12.4 Final version of results template available	All indicators	Month 50	

C1.2 Establishing a baseline

Before the creation of this website people had no tool to help them plan their journeys in advance and find their way through the city by public means of transport. This website is designed to fill this gap by making available a route planner for the public means of transport that run in the city, and information on other modes of transport, both for moving within the city, and for travelling from Iasi to other destinations. The extent to which the portal is useful has been evaluated by means of face-to-face interviews.

Since this is a new measure, there is no data on capital or maintenance costs related to such a website before the implementation. Furthermore, no surveys were carried out to point out people's opinion regarding a possible future implementation of this measure.

After the measure has been implemented, the following indicators were collected for evaluation purposes:

- capital cost – the labour costs of the Municipality of Iasi with the employee who created the website
- operating costs – the amount spent for hosting the transport planner website (data provided by the transport company);
- maintenance costs – the labour costs of the employee who updates the website – twice a year or anytime it is necessary (when the information on the site must be changed) – data provided by the transport company;
- number of website visits – statistics recorded by the website;
- awareness level, acceptance level and quality of service – assessed by surveys.

The surveys were organised by representatives of the Municipality of Iasi, of the public transport company and of the Technical University of Iasi with the help of a group of students who were informed by the ARCHIMEDES project and were instructed on how to conduct the face-to-face interviews for filling in the questionnaires. The students were divided into smaller groups of two students per measure. Given that the students were able to conduct interviews only within one and a half hours during a two-hour break between courses, and that it took about 10 minutes to fill in a questionnaire, all participants reached the conclusion that during 5 working days 2 persons can interview 100 people. It was agreed that interviews were going to be conducted any time between 8 a.m. and 5 p.m. during working days, depending on the breaks between courses.

The interviews were carried out in the same public transport stop during the two periods the surveys took place after the implementation of the measure. The 100 respondents were chosen randomly and the interviewers made sure that they were distinct from one another in the 5 days of the interviews.

The same method of informing students about the ARCHIMEDES project and about the measures implemented was applied with relation to this measure. The groups of students who carried out the interviews in the two periods differed one from another each year.

We are aware of the small sample size and of the fact that the results reflect only the situation of that particular area and are influenced only by the persons and conditions there. We cannot extrapolate the results to a larger area, so much the less to the whole city (from a geographical and from a demographical viewpoint) because of the small size of the sample and of the area of the interviews. However, we have studied through the surveys a limited demonstration area of impact for a possible upscaling at local or metropolitan level.

C1.3 Methods for Business as Usual scenario

Before the measure has been implemented there was no online tool available for planning trips in the city, and neither was there a single website where information on all modes of transport available in Iasi was

available. Moreover, information in stops about public transport lines was scarce or was totally missing. Sometimes passengers had to ask bus and tram drivers how to get to a certain place.

C2 Measure results

C2.1 Economy

Table C2.1.1: Capital costs

Indicator	Value
2b Capital costs	1,301 Euro

Capital costs are the labour costs of the Municipality of Iasi with the employee who created the website.

Table C2.1.2: Operating costs

Indicator	Value
2 Operating costs	372 Euro per year

Operating costs consist of 31 € per month spent for website hosting.

Table C2.1.3: Maintenance costs

Indicator	Value
2c Maintenance costs per year	163.2 Euro

Maintenance costs are the labour costs of the employee who updates the information on the website (twice a year).

The companies on whose services the website provides information about are asked to fill in a form about changes in the information on the site (contact data, routes, place and time of departures/arrivals, opening hours, etc.).

The costs for updating the site are broken down as follows:

- sending the form to the companies:
4 hours x 6.8 euro/hour = 27.2 euro

- centralising the data provided by the companies in the forms:
4 hours x 6.8 euro/hour = 27.2 euro

- updating the website with the data received:
4 hours x 6.8 euro/hour = 27.2 euro

Total maintenance costs for an update: 81.6 euro

Total maintenance costs per year: 163.2 euro

No additional updates than the two planned were made so far.

C2.2 Transport

The interviews for the assessment of the quality of service indicator were carried out by students on 100 people in the same public transport stop in both periods after the measure implementation (February 2011 and February 2012). The stop was not chosen by any other criterion than the fact that it is located within the CIVITAS corridor, since most of the measures of this project have been implemented along this corridor. In Figure 7 a characterisation of the respondents is provided.

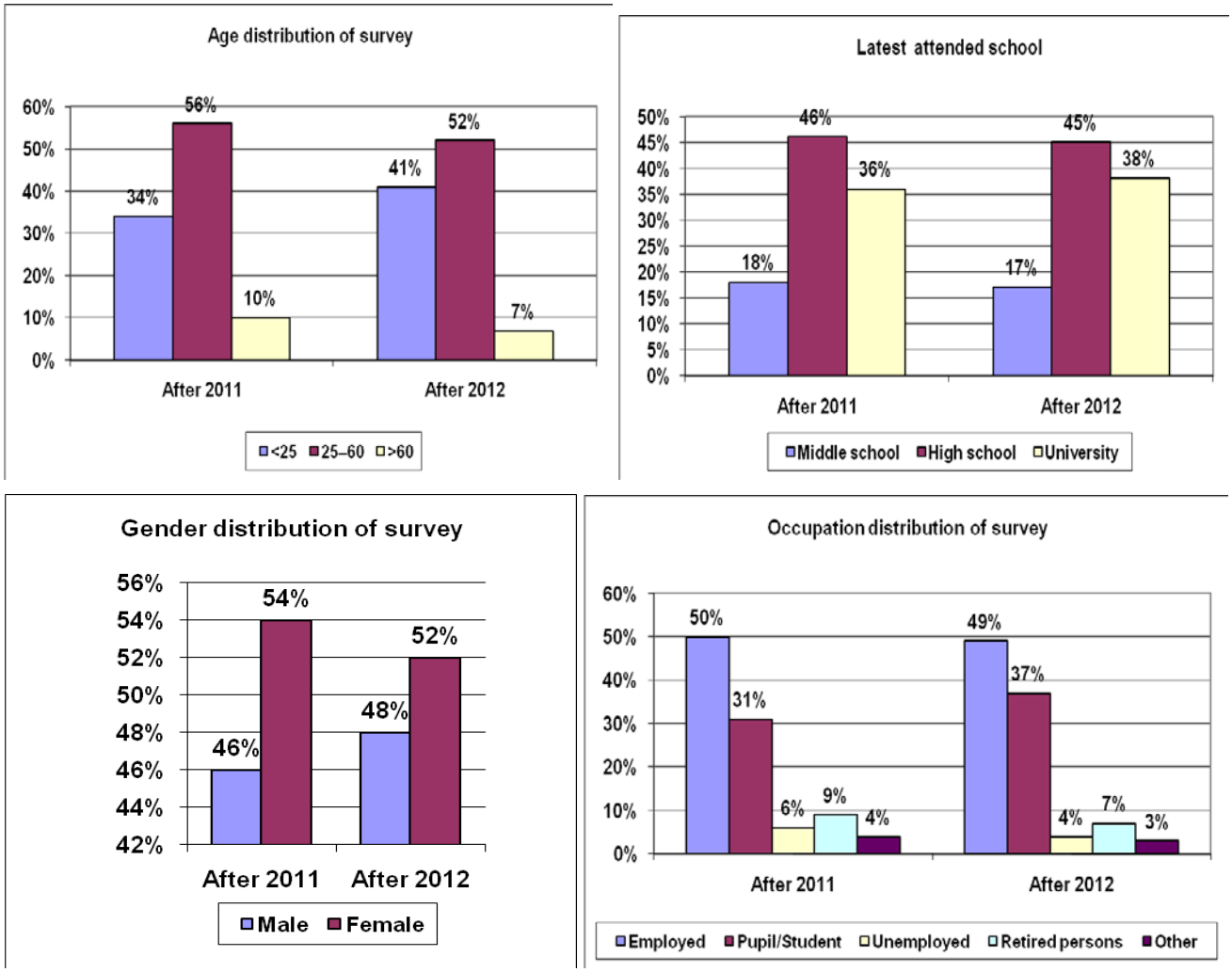


Fig. 7 Distribution of respondents

On analysing the characteristics of the respondents (Fig. 7), we notice the following evolutions in the two "after" situations:

- In both situations, most of the interviewees are within the 25 to 60 year-old bracket (56% and 52%, respectively). There is also a significant percentage of young people under 25 years of age: 34 % and 41 %, respectively.
- Most of them have attended the high school (over 45%) and many have higher education (over 36%).
- Most of the interviewees are female in both cases (54% and 52%, respectively).
- Most of the interviewees are employed (around 50%), and there is also a high percentage of students (31% and 37%, respectively).

Table C2.2.1 Quality of service

Indicator		Before (date)	After (2011)	After (2012)
19. Quality of service (%)	1. total satisfied	NA	9%	10%
	2.	NA	24%	31%
	3.	NA	32%	34%
	4.	NA	23%	17%
	5. total dissatisfied	NA	12%	8%

For the evaluation of this indicator, the respondents were asked to answer how satisfied they were about the following aspects regarding the public transport services in Iasi (the level of satisfaction was measured on a 1-to-5 scale, where 1 equalled "totally satisfied" and 5 "totally dissatisfied"):

a. How easy one can find information about public transport services via the website www.transportiasi.ro
b. How easy one can plan a trip via the website www.transportiasi.ro
c. The quality of the information given via the website www.transportiasi.ro

Both the table above, C2.2.1, and the graphical representation of the quality of service indicator contain the average of the percentage value resulted from the answers to the two questions for each of the five satisfaction levels.

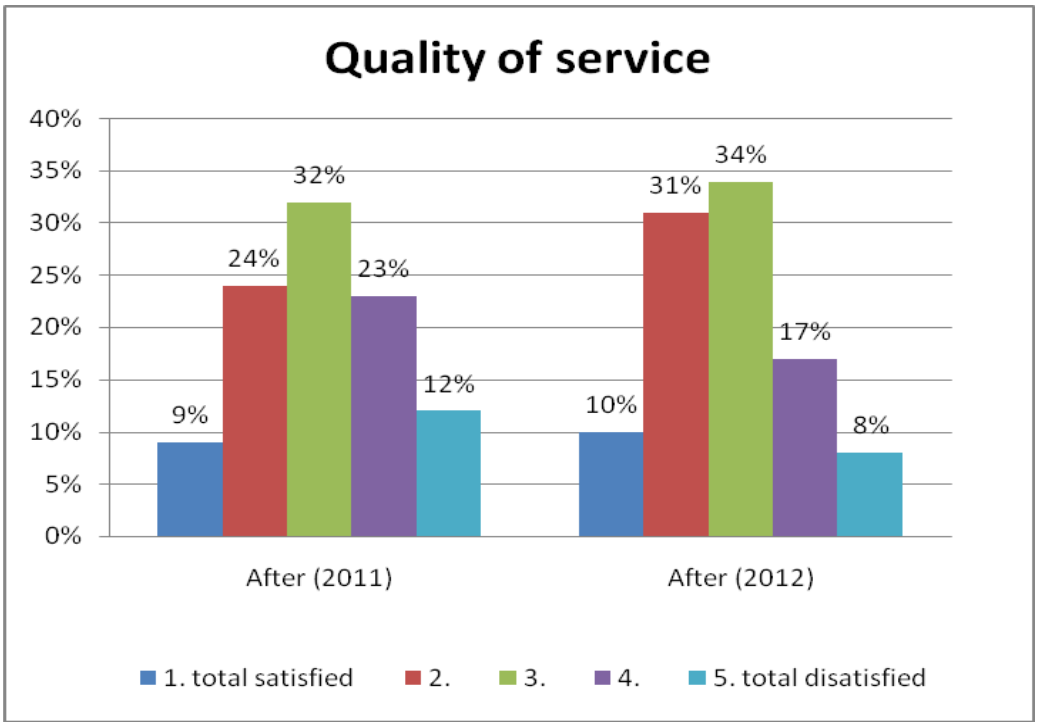


Fig. 8 Quality of service

After having analysed the data obtained from questionnaires (Fig. 8) we noticed an increasing trend of the percentage of interviewees that are satisfied with the easiness they can plan a trip with or obtain information about the public transport services from this website: from 33% (points 1 and 2) in 2011 to 41% in 2012, while the value of the category of persons that are neither satisfied nor dissatisfied slightly increased by 2%, from 32% to 34%.

C2.3 Society

The details about the categories of respondents who were interviewed for the assessment of the awareness level and of the acceptance level indicators have been presented in Fig. 7 above.

Table C2.3.1 Awareness level

Indicator		Before (date)	After (2011)			After (2012)		
Awareness level (%)	question	NA	a.	b.	Av.	a.	b.	Av.
	1. Yes	NA	71%	51%	61%	74%	56%	65%
	2. No	NA	29%	49%	39%	25%	43%	34%

	3. I don't know	NA	0%	0%	0%	1%	1%	1%

In order for this indicator to be assessed, the interviewees were asked the following questions:

a. Does the city of Iasi participate in the CIVITAS project, which is partially funded by the European Union?

b. Has the Municipality of Iasi created, as part of the CIVITAS project, a website which helps people plan their trips ahead of time and obtain information on public transport services (tram, bus, regional bus, and train routes), reserve airplane tickets, get contact data of taxi companies and car rental companies?

Both the table above, C2.3.1, and the graphical representation of the awareness level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

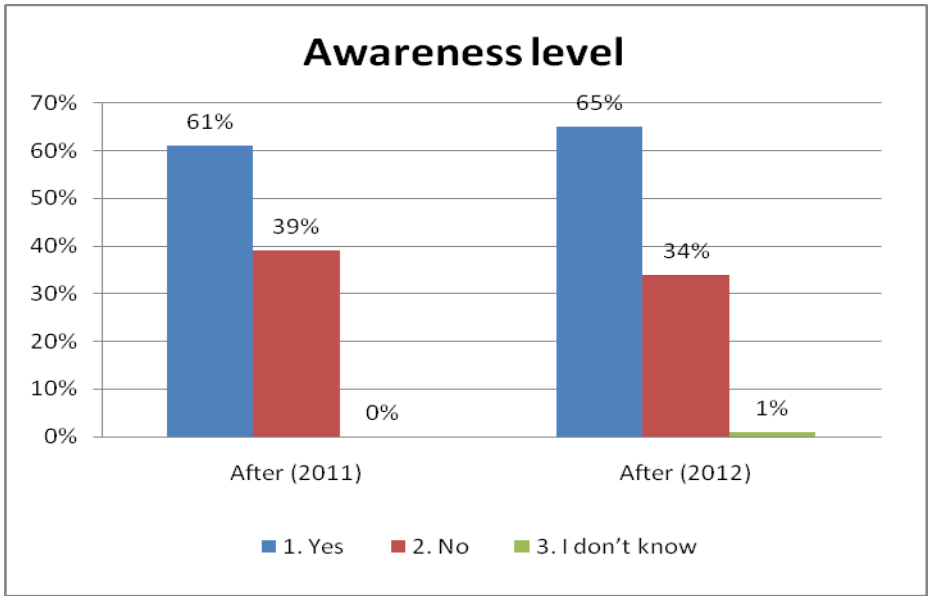


Fig. 9 Awareness level

Fig. 9 shows us an increased level of awareness among interviewees: 61% in 2011, and 65% in 2012, which means that the people who have heard about the CIVITAS project and the route planner has an increasing trend.

Table C2.3.2 Acceptance level

Indicator		Before (date)	After (2011)	After (2012)
Acceptance level (%)	1. Yes	NA	67%	70%
	2. No	NA	33%	30%
	3. I don't know	NA	0%	0%

For the assessment of the acceptance level indicator, respondents were asked:

a. Have you ever used the above-mentioned portal for planning your trips?
b. Is the information provided by the website www.transportiasi.ro on public transport services useful to you?

Both the table above, C2.3.2, and the graphical representation of the acceptance level indicator contain the average of the percentage value resulted from the answers to the two questions for each of the three possible answers.

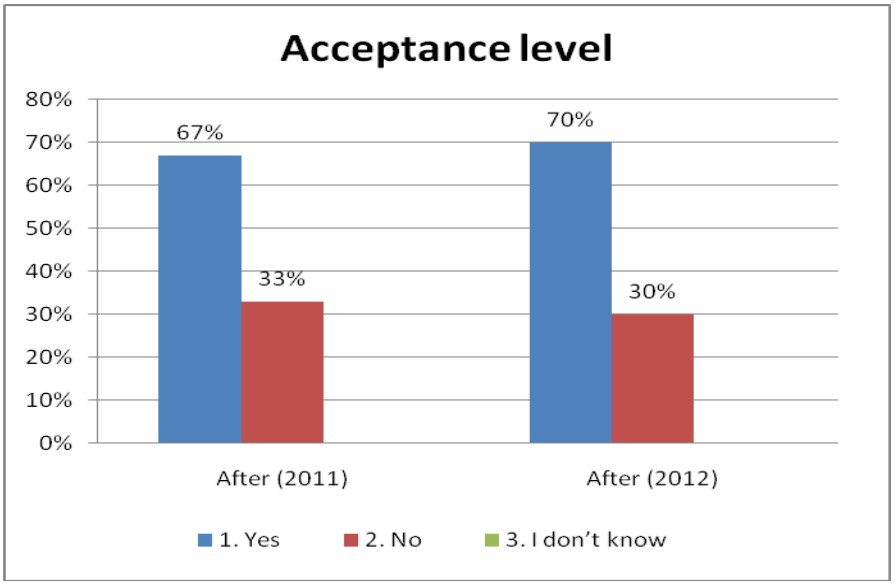


Fig. 10 Acceptance level

In 2011, from among the 51 % of the interviewees who answered they had heard about the portal, 67% answered that they had used it to plan their journeys or to find out information on transport services, which means that 34% of all 100 respondents have used the portal at least once.

In 2012, from among the 56% of the interviewees who answered they had heard about the portal, 70% answered that they had used it to plan their journeys or to find out information on transport services, which means that 39% of all 100 respondents have used the portal at least once.

The percents of the interviewees who have used the portal cannot be applied to all the inhabitants of the city who have access to the Internet because the sample size and the area where the interviews were carried out were very small.

Table C2.3.3 Total number of visits

Indicator		After
New, No. of visits	March-December, 2010	6663
	2011	7034
	January-June, 2012	4392

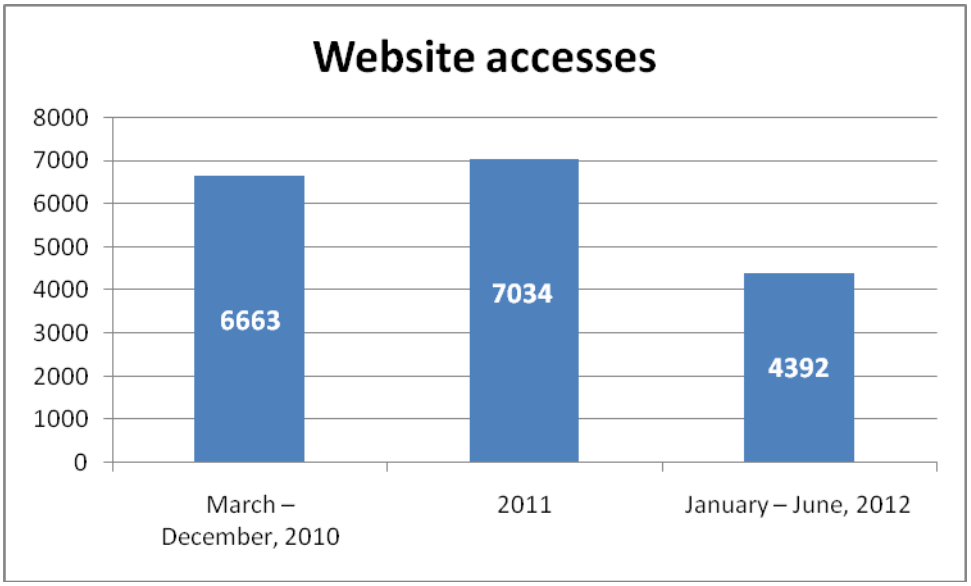


Fig. 11 Total number of visits

We cannot make a correct comparison between the total number of visits for each year because the intervals are not equal. Still, we can notice the large number of visits recorded throughout these periods.

Table C2.3.4 Monthly average visits

Indicator		After
monthly average of visits	2010	776
	2011	506
	2012	863

We have chosen to calculate the monthly average for the interval April-June because it is common to all three years. The reason for which we did not include the month of March is that it was in March 2010 when the website went online, and a very large number of visits was recorded due to the novelty that the website represented at that time (it was actually launched at the end of February).

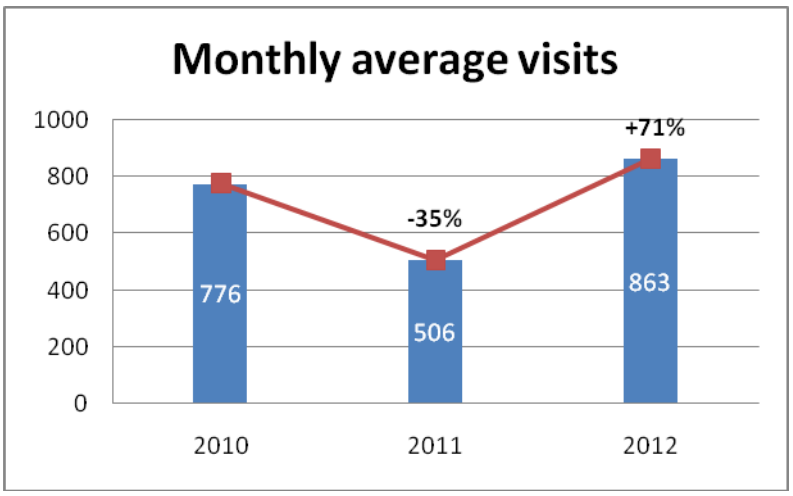
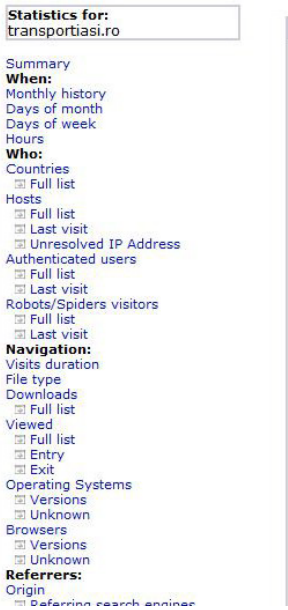


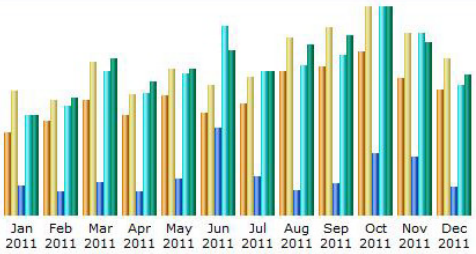
Fig 12 Number of average visits per month

Figure 12 shows a decrease by 35% of the number of average visits per month in 2011 compared to 2010; however their number has increased by more than 71% in 2012 since 2011, when an average of 506 visit/month was recorded.

Below (Figures 13-15) the activity on the website is presented in detail for the year 2011, when the website has worked for a full year.



Monthly history



Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2011	316	475	1,755	5,972	221.52 MB
Feb 2011	362	441	1,396	6,477	262.16 MB
Mar 2011	439	583	1,987	8,600	347.84 MB
Apr 2011	383	462	1,413	7,290	297.06 MB
May 2011	456	558	2,141	8,422	324.85 MB
Jun 2011	393	499	5,195	11,234	365.20 MB
Jul 2011	426	529	2,305	8,599	319.04 MB
Aug 2011	549	678	1,504	8,927	378.73 MB
Sep 2011	566	718	1,893	9,501	400.54 MB
Oct 2011	623	795	3,706	12,392	462.68 MB
Nov 2011	523	697	3,479	10,818	384.96 MB
Dec 2011	481	599	1,664	7,727	313.53 MB
Total	5,517	7,034	28,438	105,959	3.98 GB

Fig. 13 The monthly evolution of the activity on the website

Countries (Top 25) - Full list

Countries		Pages	Hits	Bandwidth
Romania	ro	21,883	86,761	3.36 GB
European country	eu	1,529	5,993	238.61 MB
Netherlands	nl	1,156	1,602	19.93 MB
United States	us	689	2,368	85.50 MB
Germany	de	506	1,369	35.08 MB
Great Britain	gb	416	1,065	34.07 MB
China	cn	345	459	7.03 MB
France	fr	257	765	24.74 MB
Moldova	md	245	1,310	52.58 MB
Spain	es	236	529	14.56 MB
Italy	it	198	668	26.48 MB
Japan	jp	154	275	5.54 MB
Bulgaria	bg	116	179	3.45 MB
Russian Federation	ru	96	256	7.70 MB
Sweden	se	73	132	3.41 MB
Norway	no	50	344	16.55 MB
Switzerland	ch	49	198	7.33 MB
Canada	ca	46	67	848.08 KB
Slovak Republic	sk	42	58	730.09 KB
Ukraine	ua	32	113	2.58 MB
Israel	il	27	118	4.99 MB
Hong Kong	hk	25	28	542.05 KB
Belgium	be	25	60	1.77 MB
Turkey	tr	21	64	3.31 MB
Denmark	dk	19	149	6.53 MB
Others		203	1029	38.33 MB

Fig. 14 The countries where the site was accessed from

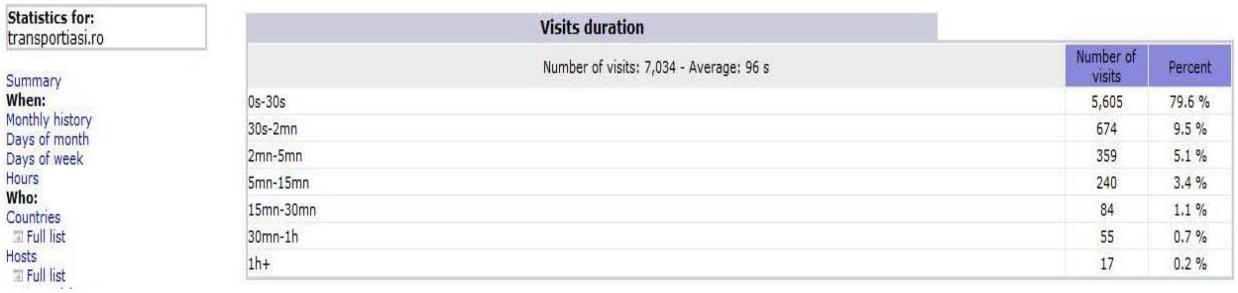


Fig. 15 The duration of visits on the site

The evolution of the activity on the site within 2010-2012 (table C2.3.5) can be obtained from the website statistics.

Table C2.3.5 The monthly average for the period April -June of some of the website indicators

Indicators	Year	2010	2011		2012	
Unique visitors		589	411	(2010) - 30%	754	(2011) + 83%
No. of visits		776	506	(2010) - 35%	863	(2011) + 71%
Number of visited pages		2357	2916	(2010) + 24%	2573	(2011) - 12%
Duration of visits at the level of the whole year	0s-30s	62.5%	79.6%		76.4%	
	30s-2min	15.3%	9.5%		10.3%	
	2min-5min	9.8%	5.1%		6.4%	
	5min-15min	7.4%	3.4%		4.2%	
	15min-30min	2.1%	1.1%		1.5%	
	30min-1h	1.8%	0.7%		0.7%	
	1h+	0.7%	0.2%		0.2%	

Table C2.3.5 shows that the monthly average of:

- the unique visitors decreased by 30% in 2011 compared to 589 unique visitors in 2010, and raised by 83% in 2012 compared to 411 visitors registered in 2011.

- the number of visits decreased by 35% in 2011 compared to 776 visits in 2011 and raised by 71% in 2012 compared to 506 visitors recorded in 2011.

- the number of visited pages raised by 24% in 2011 compared to 2357 visited pages in 2010 and decreased by 12% in 2012 compared to the 2916 pages visited in 2011.

The interval 0-30s has had the highest average visit duration on the website.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	The creation of a portal which would help people plan journeys in advance and find out information on transport services in the city of Iasi and from the city to other locations.	★★

NA = Not Assessed O = Not Achieved ★ = Substantially achieved (at least 50%)
★★ = Achieved in full ★★★ = Exceeded

C4 Upscaling of results

This measure, especially the route planner, has got a great upscaling potential:

- the schedule of trams, buses and minibuses can be integrated into the route planner application so that people know what time they should arrive in the stop so that they do not wait too long, and what the best connections are when they need to change means of transport

- new criteria for optimising the search can be added to "shortest route": shortest trip time, smallest number of changes, shortest distance made on foot when changing means of transport

- the starting and ending points of a trip should be selected from any point in the city (or even to a larger area, if the planner were extended to regional transport), not just from a list of stops, which means that the route would also include the distance made on foot and that the walking time would also be added to the total trip time; the average walking time can either be set to a default value (e.g. 4 km/h) or several choices could be made available from a drop-down list

- if route planners in other cities were built on the same platform as the planner for Iasi and hosted on the same site, the impact would be much higher

- applications for mobile phones could be developed based on the route planner for Iasi

- the planner could interact with the GPS tracking system (IAS 76, Bus Management System) after the latter is installed on the entire fleet of local public means of transport, which would bring a wide range of facilities

C5 Appraisal of evaluation approach

If this assessment had been made from the very beginning, probably the interviews would have been conducted on a much larger sample of citizens in different parts of the city so that the measure impact be demonstrated at city level.

C6 Summary of evaluation results

The result obtained after the evaluation process indicate:

- a high percentage of the interviewees that are aware of the existence of the website implemented through the CIVITAS project (61% in 2011 and 65% in 2012);
- that most of the respondents who answered that they had heard of the portal have used the website to obtain information or to plan a journey (70% in 2012 compared to 67% in 2011);
- an increase of the satisfaction level among respondents concerning the easiness they can plan a trip with and the quality of the information offered by the website (from 33% in 2011 to 41% in 2012);
- that the average number of website visits per month decreased with 35% in 2011 compared to the value registered in 2010 and increased to 863 in 2012 (71% higher than the value of 506 visits recorded in 2011).

C7 Future activities relating to the measure

Iasi will continue to maintain this website after the project ends and will try to extend the functionality of the route planner.

D Process Evaluation Findings

D0 Focused measure

X	0	No focused measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviations from the original plan

There were no deviations from the original plan in the implementation phase.
For the evaluation of the measure the "operating costs" indicator was introduced.

D2 Barriers and drivers

D.2.1 Barriers

Preparation phase

- **8. Organizational**: The ideas of the persons involved (representatives of the Municipality and of the public transport company) about how the web interface should look were very different.

Implementation phase

- **4. Problem related**: The local public transport planner cannot offer the user the possibility to set the desired departure or arriving time when determining the route between two points and neither can it calculate travelling time because of the unpredictable traffic in the city.

Operation phase

- **10. Technological**: Local public transport routes are often changed because the whole city is currently under a process of infrastructure modernisation, therefore the transport planner must be constantly updated.

D.2.2 Drivers

Preparation-Implementation-Operation phases

- **10. Technological**: The drivers are common to all three phases. In the context of the nowadays technology, the public transport company is driven by the wish to provide easy access to transport-related information, and thus to raise attractiveness of public transport. The on-line availability of information about other means of transport apart from those of the local public transport company facilitated this task.

D.2.3 Activities

Preparation phase

- **8. Organizational**: Ideas about how the site should be structured and how it should look were collected and analysed, and participants finally agreed to one of them.

Implementation phase

- **10. Technological**: The developer made the transport planner and put together information on all types of means of transportation inside the city and between the city and other destinations in the country, with the help of the representatives of the Municipality, who contacted companies providing transport services, and collected relevant information.

Operation phase

- **10. Technological**: The site is updated when changes in transport-related information occur. The moment such changes occur is easy to know in some instances (railway timetables change once a year, news appear in printed and online newspapers every time an airline company makes changes, the local public transport company, which is responsible of updating the site, has got the information on changes affecting local public transport). As for the other modes of transport, employees of the public transport company contact the companies listed within the website every six months and ask if any changes occurred.

D3 Participation

D3.1 Measure Partners

- **Iasi Municipality (Leading role)**

- Responsible with the creation of the website;
- Responsible with organising meetings with representatives of the public transport company, of the railway operators, of regional buses operators, as well of contacting taxi companies, and car rental companies in order to gather useful information for the website;

- **Public Transport Company (Occasional participant)**

- Responsible with offering background information about public transport network;
- Active participation at designing the route planner;
- Responsible with updating the site with information.

- **Technical University Iasi, Machine Construction and Industrial Management Department (Occasional participant)** – responsible for organising surveys for the assessment of the measure.

- **Other companies (Occasional participants: regional bus operators, the railway company, an airline company, taxi companies and car-rental companies)** – responsible for providing information about their transport offer to be included on the website.

D3.2 Stakeholders

- **Citizens:** they can access useful information about all public transport services in the city and from the city to other locations, and they can plan journeys in advance.
- **Tourists:** they can find out information about the public transport system in Iasi and plan their trip before they leave for Iasi.
- **Media:** articles have been written about the website.

D4 Recommendations

D4.1 Recommendations: measure replication

- **Transferability.** Such a website can be easily adapted to other cities, because centralised information on all means of transport which run on a schedule is very helpful for the inhabitants and visitors of the city on the one hand, and for the companies involved in the project on the other. The only impediment might be the cost of creating the website, but this obstacle can be surpassed by the active involvement of the partners. The transport operators should be explained that their own sites would not lose importance or utility if such a website were created; its purpose is to offer people a useful source for fast access on information on transport in the city.

D4.2 Recommendations: Learning from the experiences of the measure

- **Updating the information.** The website must be monitored and updated periodically or when necessary in order to gain and maintain the confidence of those who access it with respect to the accuracy of information.
- **Promotion.** The site should be advertised on as many channels as possible, so that potential users find out quicker about its existence.
- **Further development.** Route planners have great potential for extension and for integration of new functions, therefore one should always be open to improved solutions.

ANNEX 1

Press reactions.

http://www.flacarais.ro/cms/site/f_is/news/Iasi__City__Hall__launch"_www.transportiasi.ro"_a_information portal ho furnish information related public transport_33296.html

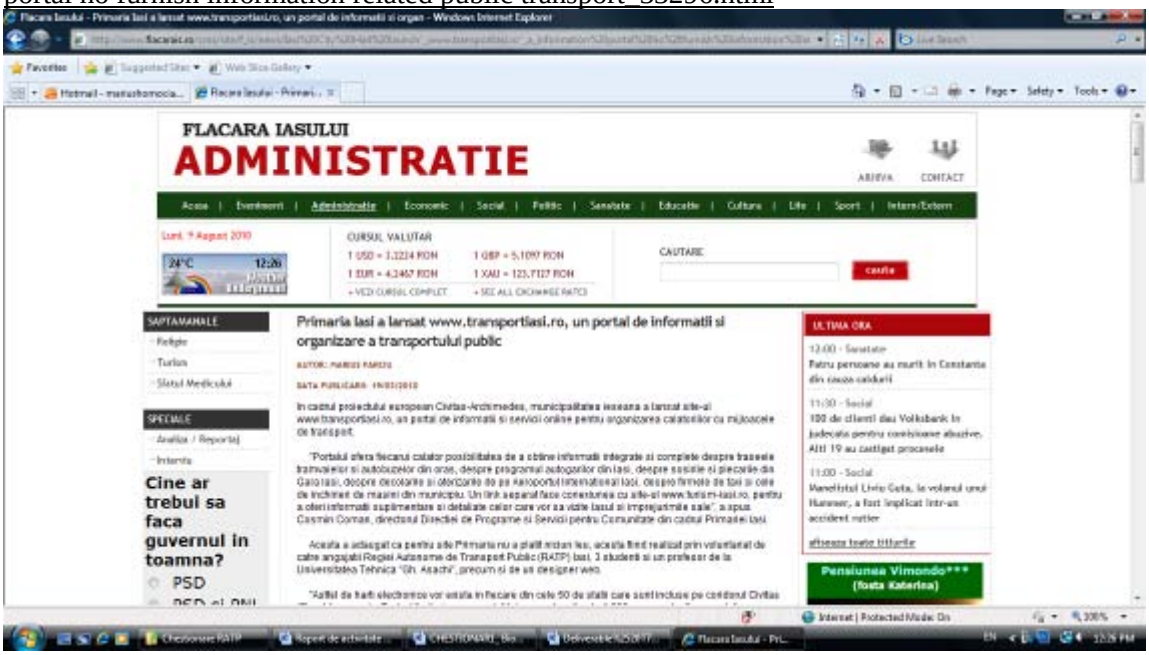


Fig. A1 Article from an electronic newspaper documenting the declaration of the officials of the Iasi City Hall regarding this website (www.transportiasi.ro)

http://www.marketwatch.ro/articol/6065/Iasi

Fig. A2 Article in Romanian language from the magazine Market Watch, which presents www.transportiasi.ro as an innovative measure for the public transport of Iasi.

http://www.newsiasi.ro/eveniment/comunicate/site-ul-unde-afli-toate-traseele-ratp-programul-autogarilor-aeroportului-si-garii.html

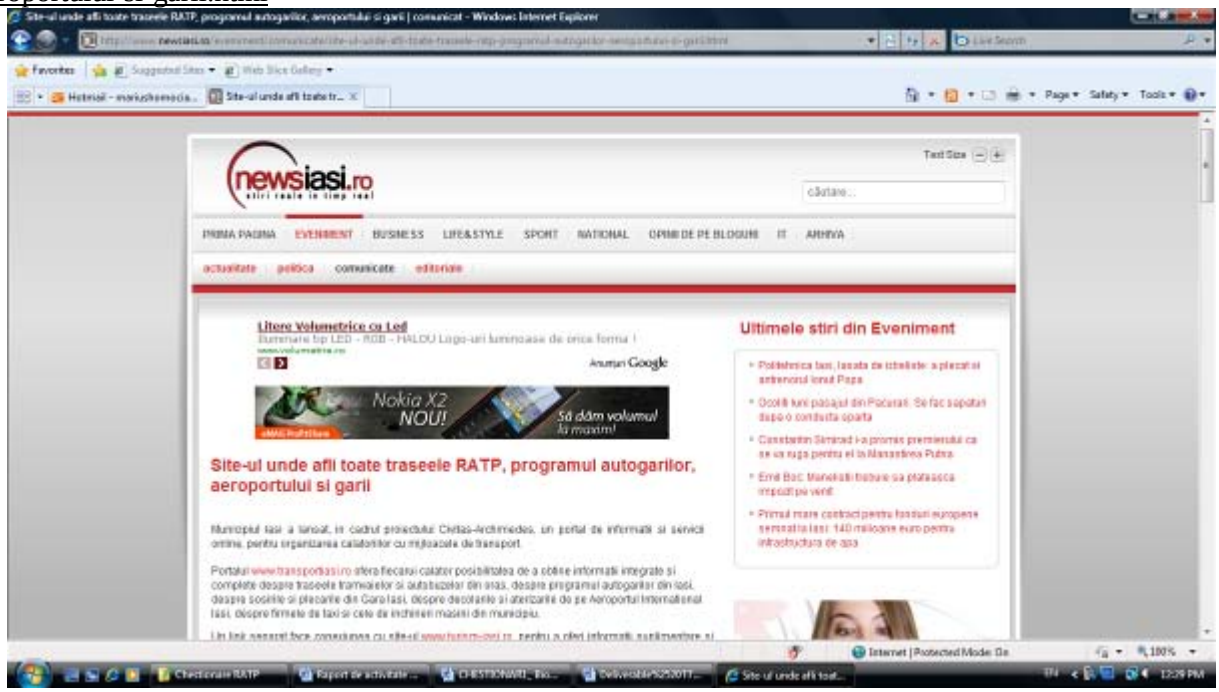


Fig. A3 Article about www.transportiasi.ro on a portal of local news

http://stiride10.ro/Iasi City Hall launched an on line portal regarding the public transport/18123

Fig. A4 Article about www.transportiasi.ro on a portal of national news

ANNEX 2

Questionnaire – after situation

M.77 - PUBLIC TRANSPORT PLANNER

Please take a few minutes to complete the following questionnaire. Your answers are very important to us and they will help us to better meet your needs. Rest assured that the data provided will remain confidential.

1. Age_____ years old.
2. Sex □ m □f
3. Your profession _____.
4. Latest attended school _____.
5. When I go by public means of transport, I prefer to use a
   □ one-trip ticket □ two-trip ticket
   □ set of 10 trips □ monthly season ticket
6. How often do you use public transportation? (How many times a week / a month / occasionally ...)
   _____
7. When I need information regarding the mode of transport between different locations or connections outside the city Iasi I use: _____.
8. Does Iasi participate in the CIVITAS project, which is partially funded by the European Union
   □ yes □ no □ I don't know
9. Has the Municipality of Iasi created, as part of the CIVITAS project, a website which helps people plan their trips ahead of time and obtain information on public transport services (tram, bus, regional bus, and train routes), reserve airplane tickets, get contact data of taxi companies and car rental companies?
   □ yes □ no □ I don't know
10. Which of the following sources of information for planning trips between different locations in the city of Iasi and between the city and other locations do you know:
    □ sites of transport companies (regional buses, CFR (the railway company), RATP (the local public transport company), airline companies)
    □ mass media □ www.transportiasi.ro □ other sources
11. Have you ever used the above-mentioned portal for planning your trips?:
    □ yes □ no □ I don't know
12. Is the information provided by www.transportiasi.ro on public transport services useful to you?
    □ yes □ no □ I don't know

13. How satisfied are you with the following aspects (within a scale from 1 to 5, where 1 has the meaning "totally satisfied" and 5 "totally dissatisfied")

The easiness you can obtain information with about public transport services from the website www.transportiasi.ro	1 2 3 4 5
The easiness you can plan a trip with by means of the website www.transportiasi.ro	1 2 3 4 5
The quality of the information provided on the website www.transportiasi.ro	1 2 3 4 5

14. Do you have any suggestions for improving the website www.transportiasi.ro?

Thank you!